CITY OF PORTLAND, MAINE
PLANNING BOARD



Brandon Mazer, Chair
Maggie Stanley, Vice Chair
Marpheen Chann
Sean Dundon
Bob Dunfey
David Silk
Austin Smith

AGENDA
PORTLAND PLANNING BOARD MEETING

The Planning Board will hold a remote meeting on Tuesday, October 13, 2020, 4:30 p.m. This meeting will take place using Zoom.

Virtual meetings are allowed using emergency legislation approved by LD 2167; 1 M.R.S. §403¬A, that authorizes cities and towns to conduct meetings online.

Allow your computer to install the free Zoom app to get the best meeting experience.

For public comment, you will need to use the "raise your hand" feature. To raise your hand via the telephone, please hit *9. You will be un-muted by the host when it is time for public comment.

ZOOM MEETING INSTRUCTIONS
You are invited to a Zoom webinar.
When: Oct 13, 2020 04:30 PM Eastern Time (US and Canada)
Topic: Planning Board Workshop and Public Hearing 10/13/2020

Please click the link below to join the webinar:
https://us02web.zoom.us/j/82731698023

Or iPhone one-tap :
US: +19292056099,,82731698023# or +13017158592,,82731698023#

Or Telephone:
Dial(for higher quality, dial a number based on your current location):
US: +1 929 205 6099 or +1 301 715 8592 or +1 312 626 6799 or +1 669 900 6833 or +1 253 215 8782 or +1 346 248 7799

Webinar ID: 827 3169 8023
International numbers available: https://us02web.zoom.us/u/kb2O7ITPwW

For more information on how to use Zoom, please go to:
https://www.portlandmaine.gov/remotePUD

Public comments will be taken for each item on the agenda and written comments should be submitted to planningboard@portlandmaine.gov

WORKSHOP - 4:30 PM

i. Level III Site Plan; 25 Bedford Street; The University of Southern Maine, Applicant. (estimated time 4:30 – 6:00 p.m.) The Planning Board will hold a workshop to consider a new 43,000 square foot student center, a new 580-bed, 220,000 square foot residence hall, and associated campus improvements. The subject property is 673,075 square feet in size, is zoned B-2, and is located within the USM overlay zone. The proposed project is subject to the City's Site Plan and Site Location of Development standards.

ii. Zoning Map Amendment; 7 Rand Road; Brockway Smith Company, Applicant. (estimated time 6:00 – 7:00 p.m.) The Planning Board will hold a workshop to consider a rezoning of a parcel at 7 Rand Road from an I-M Industrial/B-2 Community Business split lot condition to fully I-M, removing the split lot condition, via an adjustment to the zoning boundary.

PUBLIC HEARING - 7:00 PM

1. ROLL CALL AND DECLARATION OF QUORUM

2. COMMUNICATION AND REPORTS

3. REPORT OF ATTENDANCE AT THE MEETING HELD ON SEPTEMBER 22, 2020

148 State Street: Chann, Dundon, Dunfey, and Mazer present; Silk and Stanley recused; Smith absent.
1217 Congress Street: Chann, Dundon, Dunfey, Mazer, Silk, and Stanley present; Smith absent.
1844 Forest Avenue: Chann, Dundon, Dunfey, Mazer, Silk, and Stanley present; Smith absent.

4. REPORTS OF DECISIONS AT THE MEETING HELD ON SEPTEMBER 22, 2020.

i. There were no public hearing items to report on.

5. NEW BUSINESS

i. Level III Site Plan and Conditional Use; 40 West Commercial Street; Maine International Cold Storage Facility, LLC., Applicant. (estimated time 7:00 p.m.) The Planning Board will hold a public hearing to consider a proposal for a 108,024 square foot cold storage facility and associated site improvements at 40 West Commercial Street. The proposed structure is a single-story warehouse building that measures 75 feet in height at its highest point. The subject property is a vacant 17.9 acre parcel and is located within the Waterfront Port Development Zone.

Memorandum
Planning and Urban Development Department
Planning Division

To:	Brandon Mazer, Chair and Members of the Portland Planning Board
From:	Christian Roadman, Planner
Date:	October 9, 2020
Re:	University of Southern Maine Expansion Student Success Center and Residence Hall University of Southern Maine, Applicant
Project #:	PL-001040-2020
Meeting Date:	October 13, 2020



Rendering of proposed new USM student center and dorm (image: applicant)

I. INTRODUCTION

Following an initial Planning Board workshop on August 11, 2020, The University of Southern Maine has resubmitted materials in response to questions raised by both City staff and members of the Planning Board regarding a number of topics; notably transportation demand management (TDM) strategies for reducing off-street parking demand, a traffic impact analysis as required for the project's traffic movement permit (TMP), and other materials related to building design, site landscaping and a proposal for meeting city parking requirements prior to construction of a new campus garage.

The scheme of development for this project remains largely unchanged from the last workshop, and so interested parties are encouraged to review the memo prepared for that meeting for a complete overview of the university's proposal. This second workshop is intended to address the remaining Board and staff feedback as listed above, which will be the focus of this memo. The memo is structured with the intent of addressing each of the subject areas that have been the focus of discussions to date.

Notices have been sent to 190 property owners and a legal advertisement was published in the October 2 and 3 editions of the *Portland Press Herald*.



Rendering of proposed new USM student center and dorm in context from above (image: applicant)

II. PLANNING BOARD WORKSHOP – AUGUST 11, 2020

The first workshop consisted of a comprehensive overview of the project to the Planning Board by the University. The proposal for a 43,000 square foot career and student success center, 580-bed residence hall, 1-acre quadrangle and other associated site improvements was generally well received by the Planning Board. Pertaining to this application, City staff flagged proposed differences in sidewalk materials and the visibility of roof-mounted mechanical equipment as points for the Board to consider. Staff also discussed public feedback concerning placement of a new campus garage, which, while anticipated, is not included within this application.

Board feedback from the first workshop is as follows:

- Applicant should continue to work with City staff to finalize necessary components required for the traffic movement permit (TMP), a state permit required for developments with greater than 100 peak hour vehicle trips.
- The Transportation Demand Management (TDM) plan and strategies for parking demand reduction should be expanded upon, with additional efforts made to dramatically increase bicycle parking and services.

- Consider conditions of approval and/or other approaches to satisfying site parking requirements without new parking garage. This request was made because the application for the garage has not yet been submitted, and it is expected that the Planning Board will review and consider a motion on this application well in advance of considering the garage application, and certainly before construction on the garage begins.
- The University should establish some form of neighborhood outreach process to keep the Oakdale neighborhood and others apprised of plans for the university, and more specifically for the garage, which may ultimately be situated on Falmouth Street, with direct access to the adjoining residential neighborhood.
- Rooftop screening should be further evaluated for the residence hall, as there will be numerous long views of the building from various vantage points nearby, and such rooftop appurtenances will become more readily visible as buildings in the vicinity grow taller due to expanding development pressure within the neighborhood.
- Consider the viability of green spaces in both the campus quad, which is expected to see heavy foot traffic, as well as in the residence hall courtyard, as it is surrounded on three sides by building and may not be suitable for some forms of vegetation.
- Evaluate whether a waiver is required for USM overlay specific design standards which require a certain level of transparency at ground level. The concern expressed was that the passive house design and residential use of the first floor of the residence hall along Durham Street would prevent that building from meeting relevant design standards.

The applicant has submitted written narratives and plans in response to this feedback, which has been reviewed and commented on by City staff. Discussion of these various topics are listed below.

III. TRAFFIC MOVEMENT PERMIT

As defined under Maine state statute 704—A, a MaineDOT Traffic Movement Permit (TMP) is required of any project that generates 100 or more passenger car equivalents at peak hour. Any project surpassing this threshold is required to make adequate provision for traffic movement of all types into and out of the project area such that any traffic increase that is attributable to the project will not result in unreasonable congestion or unsafe conditions within the vicinity of the development.

A preliminary step in this process is the 'scoping meeting', which is a formal review of the application material to determine the scope of impact evaluation required for the proposed project. This meeting was held on August 6, 2020.

In terms of preliminary findings included within the TMP application, the campus is expected to generate approximately 160 morning and afternoon peak hour trips. This starting figure assumes all trips by automobile, however, when mode split is taken into account, in which the University estimates 70% to be driving alone, 10% to use public transit, 10% to walk or ride a bike, and 10% to carpool, the trip generation counts drop. Under this model, there would be 95 morning peak hour trips and 102 afternoon peak hour trips. With regards to trip distribution, the application assumes that 53% of trips will be to and from Forest Avenue and points south (46% to I-295 and 7% to downtown Portland or South Portland). Of the remaining trips, 30% are either to or from Brighton Avenue and then 14% are to or from points north along Forest Avenue.

The applicant and City Staff continue to refine the TMP application's suggestions and commitments for mitigation, and an updated draft is expected in the near future. Crucially, staff understand the applicant's intent is to help fund

and implement, in coordination with the City, physical infrastructure improving pedestrian safety in the area of the USM campus. More detail on such improvements is anticipated soon.

IV. TRANSPORTATION DEMAND MANAGEMENT

The new University TDM plan provides a trip reduction goal of between 3% and 6%, and a parking reduction of between 10% and 14 % by the year 2025, after construction of the career and student success center, residence hall and garage would be completed. For reference, peak hour trips are identical between morning and evening, and are between 7:30 a.m. – 8:30 a.m. and 4:30 p.m. – 5:30 p.m., respectively. Meanwhile, peak hour parking demand is between 12:30 p.m. – 1:30 p.m. To determine this information, the University reviewed data collected by the university around parking management in the Fall of 2018.

In order to meet these goals, the University has outlined a series of initiatives that may be categorized as either being related to infrastructure improvements (i.e. bikeshare, Husky Line improvements, etc..), incentive based (i.e. fitness challenges, flex-work policies, parking buy out programs, etc..) or educational (i.e. walk maps, applying for bicycle friendly university status, access guides, etc..). In total, the University proposes strategies aimed at increasing walking, bicycling, transit usage, carpooling and telecommuting, the use of parking pricing policies and other outreach and communication tools. A total of 27 TDM strategies are included in the plan, all of which would be phased into action by 2023.

At the August workshop, members of the Board specifically requested that the University consider additional opportunities for adding bicycle parking. At that time, the University had proposed approximately 50 bicycle parking spaces, both in external racks adjacent to the career and student success center, and within a dedicated bicycle storage room in the new residence hall. The applicant has since revisited this topic, and has proposed to significantly increase the supply of bicycle parking campus-wide from 260 spaces currently, to 670 total spaces upon completion of the project. Bicycle parking would be provided in a variety of different formats, as uncovered, sheltered and internal parking. In determining this amount, the University evaluated not only City of Portland technical requirements for bicycle parking, which is well exceeded by this figure, but also progressive requirements by other communities such as in Cambridge, MA and Washington, D.C. The University has also indicated that it shall apply for the Bicycle Friendly University Certification from the League of American Bicyclists. City staff are highly supportive of this approach.

The City's transportation programs manager and DPW senior engineer seek some revisions to the current TDM draft (**attachments 1 and 2**), but noted that it is improved and responsive to prior feedback. Staff anticipate working with the applicant to finalize the document in the near future, prior to any public hearing.

V. OFF-STREET PARKING CONDITION

At the August 11th workshop, the Planning Board raised concerns with the sequence of applications submitted for USM's campus expansion. This application, as stated elsewhere in this memo, includes the career and student success center, along with a 580-bed residence hall. The applicant intends to construct a new 400 car garage to meet the parking requirements of this proposed project, but the application for the garage has yet to be submitted. USM anticipates that construction of any garage would commence after construction begins on this portion of the development. The Planning Board advised the applicant to consider alternative approaches for meeting City parking requirements in the event that the parking garage does not ever get built.

For projects in the USM Overlay zone, parking requirements are set by the Planning Board on the basis of parking analysis and parking management tprovided by the applicant. The applicant submitted a parking demand analysis

evidencing current capacity and need. In developing a potential condition of approval for off-street parking, the University identified that with the TDM maximum parking reduction figure of 14% applied, the required number of spaces would be 394 additional spaces beyond existing capacity. As this cannot be met without the construction of significant new off-street parking, the applicant indicated that the requirement will be met with an imminent application for a new parking garage. If 394 additional spaces is determined to be the amount of spaces required to support this application, a condition ensuring that adequate parking will be provided prior to occupancy will be needed.

While understanding that constructing a parking garage is the applicant's intention, staff seek an enforceable proposal for how those parking spaces can be provided that isn't predicated on a separate application not yet made. Such a plan could include rental of spaces from nearby parking lots, shuttling of students from such lots, and management of existing parking lots to increase efficiency. It could also include construction of a new parking garage, but would not be predicated solely on that future application. The Planning Board has approved conditions for off-site parking to be provided prior to CO multiple times in the past year.

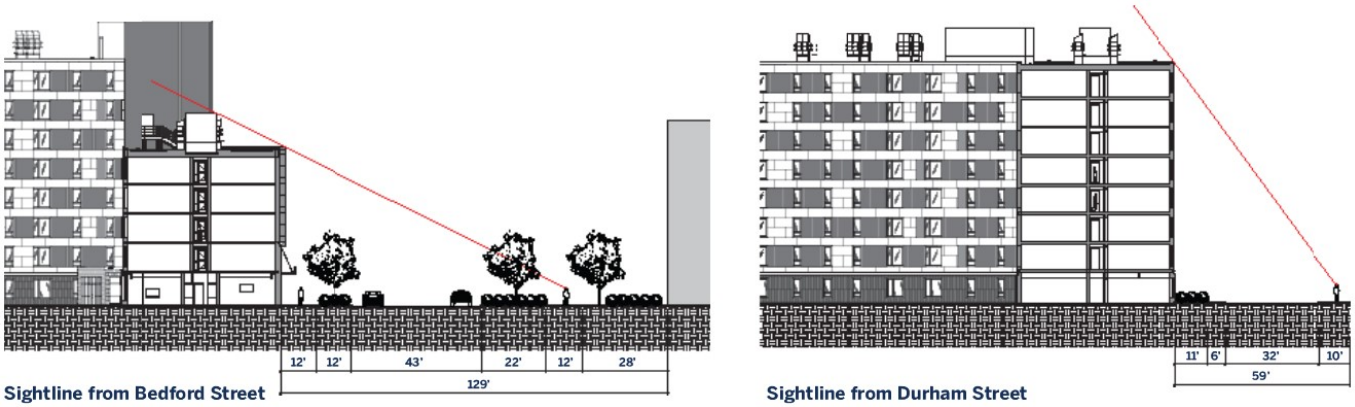
Staff particularly encourage the applicant to consider mitigating the total need for the 394 spaces with creative utilization of existing or proposed parking facilities, such as the Wishcamper lot, to meet this requirement. Changes in operation from a standard self-parking layout to a managed parking lot with access controls and valet service could result in tandem spaces, reduced drive aisle widths, and other dimensional changes that would significantly increase the number of parking spaces (and therefore decrease the number of additional required spaces). The applicant has indicated that vehicles associated with students living in the residence hall are likely to be parked for long periods of time, reducing the need for immediate access to vehicles and potentially increasing the viability of such a managed parking approach. Planning staff look forward to discussing options at the October 13th workshop, and working with the applicant, based on Board feedback, to craft a condition ensuring that the project fulfills its ultimate parking requirements.

VI. PARKING GARAGE DISCUSSION

A number of public comments were received for this project that raised concerns over the new campus garage being located on Falmouth Street. While not technically included in this application, the garage is a central component of the applicant's traffic movement permit, as trips are distributed with the garage's preferred location in mind. These public comments focused on the potential for traffic to spill over into the Oakdale neighborhood, the perceived issue of having a large infrastructure-oriented building such as a garage on largely residential Falmouth Street, and a perceived lack of outreach and community engagement on this decision.

While the site for the garage has not yet been formally selected, the University stated that it will keep neighbors apprised of the status of this anticipated project.

VII. SCREENING OF ROOFTOP MECHANICAL EQUIPMENT



Acceptable views and appropriate screening are ongoing points of consideration (image: applicant)

Initial plans, renderings and perspective views of the residence hall included no screening for roof-mounted mechanical equipment, nor long views of the building to determine the visual impact of not including such screening. At the workshop, members of the Board advised the applicant to undertake a more thorough assessment of the visual impact of these units, and noted that screening may be warranted regardless, as new development in the area will likely continue to grow taller, and have better visual sightlines to this building.

The University organized a follow-up meeting with City staff to discuss different techniques for minimizing visual impacts, including the clustering of HVAC units in strategic locations on the roof to cut down on visibility or add a parapet. Additional perspectives were provided to City staff which showed the residence hall from locations with long views of the building. Roof-top units are minimally visible from certain perspectives, including from eastbound Bedford Street and the approach from Forest Avenue.

Due to the cost associated with the construction of a screening parapet, the applicant asked that the building's design be approved without screening included. Staff, in reviewing the updated perspective images, note that the visual impact would be reduced if either parapet were introduced in a few key locations where the units are most visible, or if the roof-top units could be further grouped and screened as one cohesive roof-level design element.

VIII. SITE LANDSCAPING

With this application, the University is proposing to develop two new major green spaces: a one-acre campus quadrangle which will serve as the principal gathering point on campus, as well as a semi-private half-acre courtyard internal to the residence hall. Members of the Board asked that the University provide additional detail on how the campus quad would be maintained to account for heavy foot traffic, particularly following the winter season. Similarly, the Board requested that the University confirm that vegetation selected for the residence hall courtyard would be viable, on account of the courtyard being surrounded on three sides by building ranging from between five and eight stories in height.

The response provided by the applicant states that the campus quad is primarily intended as a passive-use green space, and that vegetation is intentionally grouped around the edges to allow for a wider range of activities to occur within the quad itself. According to the narrative response, the quad will be irrigated and regularly maintained for both visual appearance and active use.

Per the applicant, the residence hall courtyard is intended for group gatherings and events. As with the campus quad, plantings are grouped around the perimeter to provide buffer for the residential units, with larger open spaces

grouped towards the center of the courtyard. According to the applicant, plantings were specifically chosen to withstand a sheltered and shady environment.

IX. BUILDING TRANSPARENCY REQUIREMENTS

The City of Portland design guidelines relevant to development within the USM Overlay zone require that the ground level of buildings be a minimum of 50% transparent between two feet and nine feet above grade, and then between 15% and 40% for upper floors. The standard does allow for some flexibility where the ground floor use is not suitable for 50% transparency.

At the August workshop, the Planning Board asked whether a waiver would be required for the transparency standard as it relates to the ground-level frontage of the residence hall along Durham Street. The University acknowledges that this frontage does not meet the 50% requirement, with the actual figure coming in at just under 25%, and justifies not meeting the standard as the ground level use at this location is exclusively residential, which typically features less transparency to ensure privacy for residents, particularly when at ground level. Additionally, the residence hall is designed to meet passive house standards to maximize energy efficiency. Passive house requirements preclude any increase in glazing along this frontage. Based upon the use, passive house requirements, and Durham Street's characterization as a B-Street with minimal ground-level activity, staff support the proposed design, and believe no waiver is required on account of the flexibility written into this design standard.

X. ATTACHMENTS

Attachments to Memorandum

1. DPW Senior Engineer - TDM Comments
2. Transportation Programs Manager - TDM Comments
3. Urban Designer Review Memo
4. Public Comments 1 to 3

Applicant's Documents

A1. Supplemental Application Materials Cover Letter
A2. USM TMP Application Section 7
A3. USM Portland Revised TDM Plan
B1. Application Cover, Table of Contents, & Cover Letter
B2. Application Checklist & Fees
C. Project Summary
D. Waiver Requests
E. Consistency with Design Standards & Principles
F. Evidence of Right, Title & Interest
G. Easements and Other Burdens
H. Evidence of State and or Federal Approvals
I. Evidence of Financial & Technical Capacity
J. Zoning Assessment
K. Consistency with Comprehensive Plan
L. Boundary Survey
M. Availability & Adequacy of Public Utilities
N. Portland Fire Department Site Review Checklist
O. Design Narrative

P. Neighborhood Meeting Materials
Q. Street Parking Memo
R. Lighting Cut Sheets
S. Stormwater Report with Appendices
T. Landscape Design Concept Memo
U. Portland Commons Window to Wall Ratio
V. Response to Comments Letter Final
W. Sightline Diagrams
X. Facilities Master Plan
Ya. Housing Survey Market Analysis
Yb. Parking Analysis 2019
Yc. Platz Parking Garage Feasibility Study
Za. Traffic Impact Analysis
Zb. Preliminary Plan for Summer/Fall Move-In
Zc. Site Location of Development Application Package

Plans

P0. Cover Sheet & Site Notes
P1. Existing Conditions & Removals Plan
P2. Demolition Plan
P3. Site Plan Details & Notes
P4. Grading & Drainage Plan & Notes
P5. Erosion & Sedimentation Control Plan & Notes
P6. Planting Plans Details & Schedule
P7. Utility Plan & Details
P8. Steam Line Plan
P9. Construction Management Plan
P10. Photometric Plans
P11. Post Development Watershed Plans
P12. Survey
P13. Elevations
P14. Floor Plans
P15. Sightline Diagram
P16. Renderings

Memorandum
Planning and Urban Development Department
Planning Division

To: Brandon Mazer, Chair and Members of the Portland Planning Board

From: Bruce Hyman, Transportation Program Manager

Date: October 8, 2020

Re: USM Dormitory and Student Success Center: revised TDM Plan

Meeting Date: October 13, 2020

USM submitted a revised TDM Plan for review on September 29, 2020, responding to comments from the initial workshop with the Planning Board and staff comments (both written and during project meetings).

Staff comments focused on:

- Creating a connection between the TDM Plan and the pending TMP in terms of trip and parking levels and reduction targets
- Linking the sustainability goals of the university to the TDM Plan – if successful, how much would the plan achieve the stated greenhouse gas reductions?, e.g.
- Aligning the monitoring and reporting regimens so that any identified changes to TDM strategies could be implemented at the start of the following fall semester
- Incorporating any 'lessons learned' from the pandemic in terms of use of more widespread use of telecommuting/work from home and on-line classes that can reduce parking demand and trip-making
- Being more explicit documenting the existing bicycle parking supply and increasing the proposed supply, campus distribution and type (short-term/long-term, covered/non-covered, etc.)
- Strengthening the TDM strategies to make them more action-oriented and aspirational
- Expanding the types of targets and goals and time-frames for achieving the targets – mode split, trip reductions, etc.

The revised TDM Plan (dated September 29, 2020) is generally responsive to the above comments. The Plan outlines a series of TDM initiatives that has a proposed 'Launch Date' while stating "*the University is not committing to launch every one of these initiatives necessarily or committing to keeping every initiative in place permanently if they prove to not be feasible. Rather, the University is aiming to achieve trip, parking, and greenhouse gas emissions reduction targets using the most effective suite of technologies and policies available and achievable for a particular year. That said, it is the desire of the University to launch most of these initiatives in order to provide a multi-*

modal suite of options to students, staff and faculty, not all of which have the privilege of owning a personal vehicle (p. 34)."

This approach is not unusual (staff encourage flexibility based on circumstances and results based on survey and monitoring regimens) but a better idea of the 'core' elements is needed to be very helpful and informative to judge its robustness in the initial years of implementation. The list of proposed strategies is well thought out and a potential time-line is provided. Staff will work with the applicant to identify those 'core' elements of an initial package of strategies that can be adjusted over time.

The Plan does a better job of linking the university's sustainability goals to the TDM strategies. It adjusts the monitoring and reporting time-table to make it more useful for more nimbly being able to make changes to the strategies with the start of a new school year.

Two groups of strategies are most notable:

- Bicycle Parking and Bike Share. The applicant proposes to significantly increase the bicycle parking supply from the current 250 spaces to 670 spaces. These will be a combination of short and long term spaces distributed across the campus and in various configurations. Staff will work to ensure the placement and types of bike racks meet standards. USM also looks to partner with the City in launching a bike share program.
- Parking Buyout. The applicant proposes to pilot two programs - a Commuter Parking Buyout and a Residential Parking Buyout.

Staff have additional comments related to the trip-making and parking reduction targets that have been proposed (3%-6% reduction in trips and 10%-14% reduction in peak parking demand by 2025) and how these metrics would be best monitored and reported.

Attachment:
Transportation Demand Management (TDM) Plan, USM Portland Campus, September 29, 2020 (revised)

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

PB Memo on USM TDM Plan

Mike Tremblay <mtremblay@portlandmaine.gov> Fri, Oct 9, 2020 at 2:16 PM
To: Christian Roadman <croadman@portlandmaine.gov>
Cc: Helen Donaldson <hcd@portlandmaine.gov>

Christian,

I concur with Bruce's memo.

Some more minor comments on the USM TDM plan:

- The TDM plan generally lays out its existing commuting patterns and potential for reducing its single-occupancy vehicle rate in a clear manner. The TDM plan notes that 16% of parking permit holders are within a reasonable walking distance of campus (2 miles), with only 9% currently doing so; similarly, 35% are within a reasonable bike ride (5 miles), with only 12% currently doing so; and 24% are able to take transit to campus, with only 14% already doing so.

- The TDM plan calls for a parking demand reduction goal of 10-14% (159-222 vehicles) by 2025 during the peak hour of demand on campus. It should be noted that parking that is offered below market rate (or free) represents an incentive that is often overlooked; in fact, perhaps the single most significant way to reduce vehicle dependency is to limit the overall supply of parking, and then charge appropriately for parking given that supply. The TDM plan discusses a buyout option to encourage students to arrive on campus via other means of transportation, which is a positive step, but plans to manage the demand of parking using pricing, management of parking supply, etc. should be discussed further. On the other hand, the City has continuously reinforced to USM that University-related parking in the residential neighborhoods around campus is not to be permitted, so USM is tasked with striking a balance within these fine parameters. In short, DPW is supportive of the short-term (2025) goal for parking demand reduction. USM is strongly encouraged to continue to push towards more demand reduction leading up to, and following, 2025.

- The TDM plan lays out a greenhouse gas reduction goal of 20% by 2025. This is a significant short-term goal. The University has a goal to be carbon-neutral by 2040. While not entirely tied to transportation, the means to achieve goals of a TDM plan and a climate action plan are typically similar.

- The list of TDM initiatives is substantial and positive. The university has noted that it will likely choose which initiatives to pursue based on which are most cost-effective (in a sense of dollars per reduced trip or a similar metric). DPW is confident that worthwhile measures will be included, but additional clarity on this matter would be appreciated as the University arrives at decisions.

Cosmetic tweaks to address before finalization:
- Figure 4 should read "Sidewalk available on Forest Avenue Provides Access under I-295" or similar
- The relative proximity of the Back Cove Trail should not be understated, as it provides safe and comfortable ped/bike access to numerous Portland neighborhoods including Bayside and the Eastern Prom Trail, which connects to the Old Port. I would expand on this discussion (page 11) and separate it from the more regional discussion.

Mike Tremblay, P.E.
Senior Engineer
Engineering Division
Department of Public Works
City of Portland, ME
mtremblay@portlandmaine.gov
P. 207.874.8881 F. 207.874.8852

[Quoted text hidden]

Planning and Urban Development Department
Planning Division

Subject: USM Overlay Design Review – 25 Bedford Street

Written by: Caitlin Cameron, Urban Designer

Date of Review: Thursday, October 1 2020

The USM housing and student center project at 25 Bedford Street was reviewed according to the *City of Portland Design Manual* standards by Caitlin Cameron, Urban Designer against the *USM Campus Design Principles and Standards* (Appendix 3 of the Design Manual).

Design Review Comments*:*
All major and minor development . . . shall be designed to create a ***quality and cohesive campus*** *environment while* ***integrating with and respecting the residential character of surrounding neighborhoods*** *as demonstrated by compliance with the principles and standards . . . included as Appendix 3 of this manual.*

(d) B-2 Commercial Business Zones
Principle A. Campus Design – The project uses contemporary architecture that adequately conveys the uses of the two buildings while relating them to the established campus character in building scale, massing, and the material palette. Overall, the project creates or improves the pedestrian environment with active edges and sidewalk improvements as well as open space amenity. The residential building placement reinforces the street wall and provides an active edge, especially on Bedford Street. The placement of the student center back from the street accomplishes the goal for vital open space and appropriately distinguishes this buildings as having a more public and open use on campus from the more private residential use of the dormitory building. The location of this site is removed from the existing residential context – the buildings are appropriately related (in scale and design character) to the institutional buildings on Bedford Street.

A1. Campus Edges – the residential hall mediates between the need to create active street edges, convey and protect the private use, provide scale transition from low-rise buildings to the mid-rise campus buildings, while also providing a positive gateway entrance experience from the Forest Avenue approach. The project appropriately creates lower height and massing at Bedford Street in dialogue with the Wishcamper and Abromson Center. The building sensitively places the taller portion of the building to the rear/interior of the lot away from the street to make a scale transition. This allows for some visual emphasis at the most visible corner approach with tower elements.

A2. Building Orientation – The buildings are appropriately oriented towards Bedford Street. The student center is creating a distinctive relationship to the street by being set back and allowing for a south-facing quad open space.

A3. Pedestrian Environment – The pedestrian environment on Bedford Street is improved by creating a strong street wall with active frontage and a prominent entry oriented to the street. The project includes sidewalk and landscape improvements. The quad space creates a flexible open space amenity that provides some relief to the street wall and functional space for many kinds of activity.

A4. Gateways – The two proposed buildings are mid-block from the Forest Ave/Bedford gateway. However, though technically not a gateway location, the residential hall does visually serve as a first impression of the campus for those approaching on Forest Avenue with tower-like elements oriented to the approach.

A5. Views and Landmarks - The massing arrangement and circulation tower have been well placed, detailed to create visual interest at day and night as viewed from Forest Avenue and Bedford Street. The project does not appear to compete with or interfere with the view corridors to identified landmarks. There are no view corridors here to city buildings or natural resources. See comments below regarding rooftop design and long views.

Principle B. Access and Circulation – This proposal continues to build up an existing street and pedestrian realm. Bedford Street is a primary street on-campus and improvements to the material, circulation, landscape, and open space amenity bring the quality of the streetscape to an appropriate level for this main street status.

B1. Connectivity – The building placement keeps most of the internal campus circulation intact. The quad space does have some grade change but keeps multiple access points and flexibility. The residential buildings, for security reasons, proposes one main entrance oriented to Bedford Street.

B2.Circulation – The circulation diagram shows consideration has been given to the internal circulation through the new quad space and around the student center building. Staff recommend the design team consider desire lines and the tendency for pedestrians to use the shortest path – in some cases, landscape and path design do not seem to reflect where people will actually walk. Staff suggest some of these right angles and obstructions be removed and that the university revisit and revise paths through these spaces after observation of desire lines and on-the-ground use of the spaces. The overall building scale and placement allows for reasonable permeability through the campus while improving the experience on Bedford Street.

B3. Multi-modality – The multi-modal nature of Bedford Street is maintained.

B4. Traffic-calming – There is little revision to the roadways. Crosswalk design and pedestrian access along Durham Street are being evaluated by DPW peer review.
B5. Sidewalks - Bedford Street appropriately has wide sidewalks to meet this standard. However, the applicant proposes concrete instead of brick. This standard calls for brick pavers which staff support for visual continuity on Bedford Street where brick was previously introduced with the sidewalk improvements on the opposite side of the street. Durham Street is a secondary street with little anticipated pedestrian traffic.
B6. Street Lights – The proposal will continue with the established fixture selection already found on campus.

Principle C Parking, Loading, and Service Areas – parking structures/lots are not included within this proposal.

C1. Structures – n/a
C2. Active Uses – n/a
C3. Decks and Ramps – n/a
C4. Surface Lots – n/a

C5. Loading and Service Areas – the loading and service areas for both buildings are located off Durham Street to the rear/interior of the site and away from street view. The landscape plan shows minimal landscaping/screening of these features relying on the buildings to provide the screen from the public rights-of-way.

C6. Utility Services – generators and transformers are located in a rear service area between the two buildings and out of view of the public rights of way. Other utilities are provided underground. Rooftop systems are consolidated and placed away from building edges to reduce visual impact from the street. Sight line diagrams show these units will not be visible from the immediate surroundings of the buildings (see sightline diagram and overall birdseye view). However, some long views from eastbound Bedford Street and approaching on Forest Avenue will be able to see these units which are numerous and unscreened. In conversation with the applicant, staff suggested in key locations, either an increased parapet height to minimize the impact of these units from the long views or else a screen element that unifies the rooftop appurtenances into one cohesive design element at the roof level. The standard emphasizes impacts to residential areas – the impact on neighboring residential properties is not determined to be adverse.

Principle D Architectural Design – USM chose with this proposal to create visual connection to the more recent campus buildings such as the Wishcamper and Abramson Center since this streetscape and these buildings are the most immediate visual relationship. Buildings on the USM campus do vary in era and style. Some consistent characteristics include buildings of similar scale, massing, and height. Most buildings include a simple material palette (this varies from red brick, yellow brick, and metal panel, curtain wall). Many of these institutional buildings include a high level of fenestration or curtain wall.

D1. Height – The proposed building heights are comparable to the existing scale of campus buildings. The residential hall appropriately places the taller massing back from the street. The student center is a lower height appropriately conveying its use as a more “civic” and open building compared with the residential or academic buildings.

D2. Setbacks – The residential building maintains an urban street wall with no setback. The student center is placed back from the street to create the quad open space meeting the standard regarding a landscape design feature as an exception to the setback standard.

D3. Stepbacks – n/a

D4. Massing – The residential building breaks the massing by stepping up the height towards the rear/interior of the lot. This creates a transition of scale as well as a more visually interesting corner condition. Upper story bays on Bedford Street convey the residential use of the building

and provide massing variation/visual interest to what is a long façade. High levels of fenestration at the street, circulation towers, and communal spaces provide connection between the street and the building interior. Durham Street includes residential units near the street and is therefore less open, exposed or visually accessible. This reinforces the hierarchy of Bedford as the front orientation for the building. Long expanses of façade are detailed either with bays, material changes, or fenestration.
D5. Entrances – The primary entrance to both buildings are oriented to Bedford Street. In the case of the student center, this is exaggerated by a tall portico space. The high level of fenestration and canopy bring emphasis and legibility to both residential and student center entrances.

D6. Windows - The standards around level of transparency and % fenestration appear to be met. The projects successfully mediates between providing visual interest and connection of activity to the street with balancing the private nature of the residential use.

D7. Materials – The applicant chose a more contemporary palette that visually comports with the Wishcamper and Abramson buildings. This includes a grey material palette with a high level of glazing and use of metal. This is appropriate in this particular streetscape given the immediate context. These buildings are not immediately adjacent to residential neighborhoods or sensitive uses or historic architecture. The goal of future development here is to convey the 21st century campus which includes goals of sustainability and a commitment to its relationship to Maine – geography, culture, economy. Though elements such as exposed timber are not common in urban architecture or the character of Portland's downtown, staff were able to support this departure from some of the traditional material choices in order to distinguish the student center use and convey the commitment to sustainability and connection to Maine materials and natural resources. See comments above regarding rooftop appurtenances.

D8. Signage – n/a
D9. Historic Structures – n/a
D10 Original Residential Structures – n/a

Portland Maine Yes. Google's good here.

Jennifer Munson <jmy@portlandmaine.gov>

Fwd: USM Traffic Movement Permit

Matthew Grooms <mgrooms@portlandmaine.gov> Thu, Jul 30, 2020 at 10:53 AM
To: Jennifer Munson <jmy@portlandmaine.gov>

Hi Jen,

I am forwarding a public comment for the USM project, PL-001040-2020. Thanks!

Matt

---------- Forwarded message ---------
From: **Elizabeth Burke** <emburke207@gmail.com>
Date: Wed, Jul 29, 2020 at 11:13 PM
Subject: USM Traffic Movement Permit
To: Matthew Grooms <mgrooms@portlandmaine.gov>

From: 5 Oakdale Street
Portland, Maine 04103

29 July 2020

To: Matthew Grooms
Planning Department
City of Portland, Maine
389 Congress Street
Portland, ME 04101

Dear Mr. Grooms,

I would like to request a hearing in the City of Portland regarding USM's desire to move traffic mostly up Falmouth Street.

Most specifically, I want USM to pay for Oakdale Street to become a dead-end street at the junction of Falmouth and Oakdale Street.

Oakdale is a very very old historic neighborhood, now full of families with children. I am not interested in it becoming a part of the fast easy way to get from one way to another.

In fact, so far as I'm concerned, I'd like Falmouth Street to be shut down. Let the University use Bedford Street as its main avenue. Bedford Street belongs to the City of Portland, and also the State of Maine, so the University will have to buy it from the city and/or the State, in order to shut it down. If they want exclusive use of Falmouth Street, they should pay to protect the Oakdale neighborhood.

Very truly yours, Elizabeth M. Burke

--
Matthew Grooms, AICP
Senior Planner
Planning Division
City Hall, 389 Congress Street, 4th Floor
Portland, Maine 04101
(207) 874-8725 (T)
(207) 756-8258 (F)
mgrooms@portlandmaine.gov

August 11, 2020

City of Portland Maine
Department of Planning and Urban Development
389 Congress Street
Portland, ME 04101

VIA EMAIL: planningboard@portlandmaine.gov

RE: Plan Number PL-001040-2020 (USM Career & Student Success Center – Portland Commons)

Dear Sirs:

We are in receipt of the public notice from the City of Portland Planning Division regarding the aforementioned project. Please consider this notice regarding our written comments and responses to this project.

As you know, Oakhurst has operated in the city since the company was founded in 1921. As we near our 100th year anniversary, we continue to operate and employ nearly 200 employees and provide economic benefit to many local companies, suppliers and most importantly our dedicated family farming community.

Oakhurst has existed on the current site since 1922, prior to the development of the of the USM campus on this current site. Our facility has grown since then and primarily consumed the same footprint since 1951 with various expansions since then to continue to effectively service the New England marketplace.

Oakhurst continues to support USM with their growth and expansions plans. We have been neighbors for many years and desire to continue to effectively be good neighbors and co-exist in this growing community.

We do have a handful of concerns that we feel can be reasonably addressed throughout the planning and approval process with the City of Portland. Oakhurst has engaged some local engineering resources to assist us with understanding the project impacts and any conflicts to our continued safe and efficient operations. We have only been in receipt of project materials for a relatively short amount of time.

We expect the results of our engineering review within the next 30-60 days and will continue to work collectively with USM's project management team to resolve any concerns. In addition, we will provide a more official response to the planning board regarding our concerns, mostly related to vehicular traffic, parking and utility services in and around our property.

We appreciate the opportunity to respond to this notice and invite you to contact us with any questions or concerns prior to us providing our more detailed response to this project.

Sincerely,

John H Bennett

John Bennett
President
Oakhurst Dairy

Oakhurst Dairy
(207) 772-7468

364 Forest Avenue
Fax (207) 874-0714

Portland, Maine 04101
www.oakhurstdairy.com

Google Groups

USM Project

Mike Carey <mikebcarey@gmail.com> Aug 28, 2020 8:31 PM
Posted in group: **Planning Board**

Spencer,

Happy end-of-Summer!

Annie and I participated in the Planning Board meeting a couple weeks back on the USM Project. I'm about to provide some critical feedback, but I also want to acknowledge that I believe the University's growth is a benefit to the city and can be a benefit to the neighborhood with some adjustments.

I'll brief in my comments. I hope you consider this when the council makes a decision on the project.

Comments:
1) I'm beside myself that USM is permitting the student center and dormitory prior to permitting the parking garage. From a process perspective it's confounding. Worst case scenario the City will have two buildings approved and under construction, but without the parking garage, may be unable to get a CO. I can't see why USM or the City would allow this to happen.

2) I'm disappointed that USM is essentially turning its back on the neighborhood by positioning all campus amenities toward Bedford Street and positioning Falmouth Street to be only an on-ramp for cars to the newly enhanced campus. The University held a neighborhood meeting nearly two years ago to get feedback on their plans and pitch their bond proposal. At that meeting, the overwhelming feedback from the neighborhood was "please don't isolate yourself from us". The current project seems to do exactly that.

3) In regards to the parking garage...in the meeting there was much talk about traffic study and plan, but unfortunately that information had yet to be made public. This circles back to #1 above. The process is really challenging. I do understand that information is now available and there is possibility for parking garage on bedford which may be the better alternative here.

4) President Cummings has mentioned that The University’s goal is to limit both traffic and parking impacts to the neighborhood. With this in mind - how do we initiate a conversation about adjusting traffic flow in and around the university? Our neighbors are expressing concern about increased pass through traffic in the neighborhood. Perhaps it's time to look at creating one-way streets, some traffic calming and limiting access to the neighborhood from Falmouth Street.

Please know that the above comments are not made out of concern for "property values" or the ability to "sell" our property in the future. I'm focused on creating a liveable, walkable, safe neighborhood that enhances the University and the City of Portland.

As always, thank you for your willingness to listen and weigh all aspects of the situation.

-Mike
207-776-1936
--
207-776-1936 (m)

COMMITMENT & INTEGRITY
DRIVE RESULTS

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Portland, Maine 04102
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T 800.426.4262
T 207.774.2112
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September 29, 2020

Matthew Grooms, Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: University of Southern Maine
Career & Student Success Center and Residence Hall (Portland Commons)
Supplemental and Updated Application Materials

Dear Matthew:

Thank you for your continued efforts reviewing the application materials for the proposed Career & Student Success Center (CSSC) and Residence Hall (Portland Commons) at 25 Bedford Street. This letter compiles supplemental application materials to be entered into the record in advance of the Planning Board Workshop scheduled for October 13, 2020. The additional materials are detailed below.

1. Supplemental Narrative regarding Off-Street Parking

Pursuant to the Site Plan standards, the Planning Board shall determine the off-street parking requirement, based upon the applicant's parking study and a recommendation from the City Transportation Engineer, for projects in the USM Overlay zone. USM's parking study anticipates a total need of 394 off-street parking spaces generated by the project. That number is generated by the following components:

1. 392 parking spaces for Portland Commons. The number was derived by a review of the parking rate for the residential students on USM's Gorham campus which is 68%. Although students on the Portland campus may be less likely to have a car than on the Gorham campus, Portland Commons will be occupied by upper class and graduate students who are more likely to have a vehicle and an off-campus job. Therefore, USM found that the 68% rate is a reliable formula for the Portland Commons.
2. 66 parking spaces is the net number of spaces displaced by the project.
    - 130 spaces will be displaced from the Woodbury surface lot (P2) for the quad.
    - 41 spaces will be displaced from the Facilities Building lot (P7) for Portland Commons.
    - 6 spaces will be displaced in the Physical Plant lot (P8) for the loading dock.
    - 4 spaces will be displaced in the Law School lot (P6) for the relocation of the salt shed.
    - The expanded Wishcamper surface lot will add 115 spaces.
    - The net result is a total of 66 displaced spaces.
3. The revised TDM anticipates up to a 14% reduction in parking demand at the peak demand hour. 392 + 66 – 14% = 394

As discussed with City staff and as mentioned in the application, USM is actively looking at on campus solutions to meet the parking demand, including a new structured parking facility. The parking demand will be satisfied prior to occupancy of Portland Commons. We therefore request the following condition of approval: "Prior to obtaining a certificate of occupancy for Portland Commons, the applicant shall demonstrate to the satisfaction of City staff that the applicant has provided a minimum of 403 new off-street parking spaces. Such requirement may be met through various means

or a combination thereof, including but not limited to structured parking, surface parking, joint parking, and payment of a fee in lieu (if made available off peninsula)."

2. **Supplemental Application Materials (uploaded to Eplan)**

   The following supplemental application materials are provided:

   - *Landscape Design Concept Memo*, prepared by SMRT, dated August 20, 2020. This memo describes the design intent of the proposed landscaping, including the envisioned uses for the spaces and the types of plantings selected.
   - *Portland Commons Window to Wall Ratio Memo,* prepared by SMRT, dated August 28, 2020. This memo reviews the window to wall requirements of the USM Design Guidelines and provides the glazing calculation for Portland Commons.

3. **Updated Application Materials (uploaded to Eplan)**

   The following application materials have been updated:

   - *Transportation Demand Management (TDM) Plan,* prepared by VHB, updated September 29, 2020. The TDM has been updated to address comments and questions from City staff and the Planning Board.

If you have any questions or require additional information, please do not hesitate to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

cc: Alexander Porteous, Aaron Witham - University of Southern Maine
Craig Piper - SMRT Architects
Mary Costigan - Bernstein Shur

Enclosures: *Landscape Design Concept Memo*, August 20, 2020
Portland Commons Window to Wall Ratio Memo, dated August 28, 2020.
Transportation Demand Management (TDM) Plan, dated September 29, 2020

Memo

SMRT Architects and Engineers
877.700.7678
smrtinc.com

To	Portland Planning Department	**Date**	August 20, 2020
From	Kenneth D. Costello	**Project No.**	19206
Subject	Site Landscape Narrative	**Project Name**	USM SSC and Portland Commons Residence Hall

Site and landscape design

The landscape/site design for the new USMC SSC and Portland Commons Residence Hall is intended to enhance the USM Portland campus while maintaining and bettering pedestrian connections within the eastern portion of the campus.

The design intent for the CSSC quad and Portland Commons courtyard is to allow these spaces to be utilized dynamically for any needs the university has, including passive and active recreation, special events and community/university gatherings.
The CSSC quad will be the heart of the campus in regard to student activity and an entrance feature as visitors arrive at the Campus. As such, the University intends to utilize the quad and adjacent front porch of the CSSC for student gatherings, special events/performances and community uses. In addition, the open quad will allow for active uses such as frisbee and ball throwing along with more passive student uses such as studying, eating and small group gathering. The quad is intended to be irrigated to maintain the lawn in good condition for visual and use purposes.

Landscaping around the quad is intended to meet many uses. Trees along Bedford mimic the ornamental trees on the south side of Bedford Street to emphasize a cohesive campus but spacing is modified directly in front of the quad to allow for better views to the quad and CSSC. Trees on either side of the quad provide shade for students who are lingering at the quad and also provide visual focus from Bedford St. to the CSSC. Landscaping and stormwater management along the east side of the quad also separate the active uses of the quad from the residential units to provide buffers and privacy.

Where the CSSC quad is the heart of the campus, the Portland Commons Residence Hall courtyard is the backyard for the building tenants. The courtyard also will function as a gathering and event space with a large patio and adjacent lawn area for building events, general recreation, and social gatherings. Landscaping in the courtyard is intended to bring the space down to human scale, provide shade for small gatherings and buffer active spaces from the residential units. The perimeter of the courtyard is planted to provide an appropriate buffer from residential uses and provide the most flexibility with larger open spaces in the middle. Planting within the courtyard has been selected to withstand the more sheltered, shady environment while minimizing maintenance.

Memo

SMRT Architects and Engineers
877.700.7678
smrtinc.com

To	City of Portland	**Date**	08/28/2020
From	Kristen Damuth	**Project No.**	19206
Subject	Glazing Calculation	**Project Name**	Portland Commons

Glazing Criteria

Window to wall requirements

Per Standard D-6 of the USM Design guidelines, Appendix 3 of the City of Portland Design Guidelines.

- First Floor along Public Streets 50% of the wall area between 2 and 9 feet.
- Upper floors 15% to 40%
  - If it can be demonstrated that the building program precludes transparent windows along first floor street frontages, the other surface details shall be used (see Standard D-4)

The proposed Portland Commons building has been developed to place the most active and transparent functions along Bedford Street. This is including the primary entrance to the building, Student Kitchen Space, Student Living Room, Meeting Rooms, Bicycle Storage and Work room, and Administration space.

The location of these programs allow us to meet the 50% transparency requirements along the ground floor of Bedford Street as shown in the attached Drawings. This includes two set back portions of the building that are comprised primarily of opaque façade. The Eastern set back portion of this façade is a residential bedroom and programmatically does not want an increased transparency. The Western Opaque assembly helps define the massing of the buildings as it returns northward up the quad. If these two areas were to be omitted and only what is directly situated on Bedford Street is calculated, we achieve a higher percentage of transparency; 60%.

The upper Floors along Bedford Street achieve a 21% window to wall ratio and is within the 15%-40% requirement.

The Durham Street Ground floor is comprised of entirely residential units and is setback from the sidewalk to create privacy for these units. The window to wall ratio does not meet the 50% requirement as shown. The combination of the residential program and Passive House requirements within these units precludes any increase in glazing. The overall design approach as previously discussed has adopted the Standards set forth in Standard D-4 and has broken the massing down into components scaled to the context of the adjacent buildings and has established a clearly defined base to the building.

The upper Floors along Durham Street achieve a 28% window to wall ratio and is within the 15%-40% requirement.

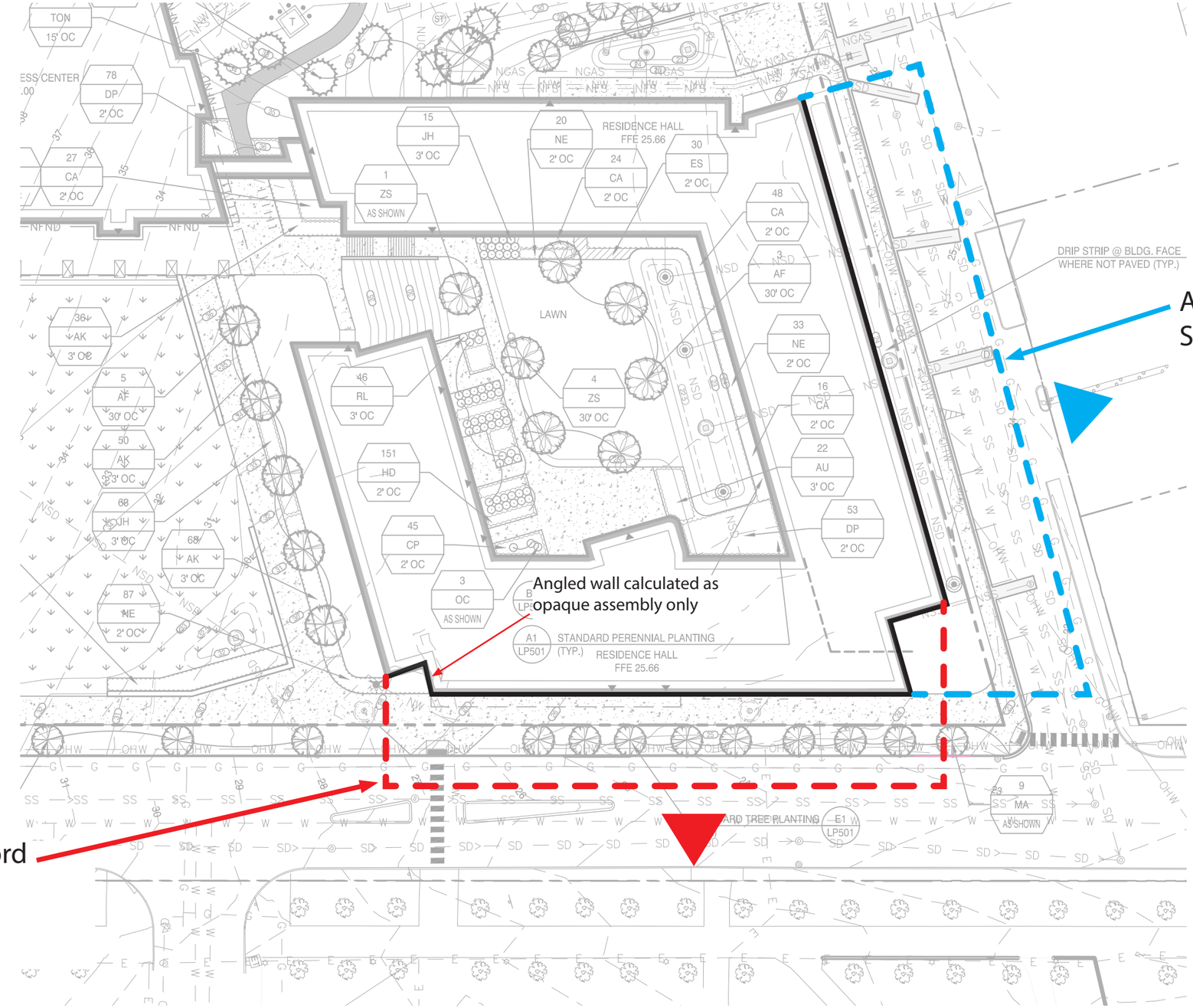
UNIVERSITY OF
SOUTHERN MAINE

Residence Hall & Career & Student Success Center

GLAZING CALCULATIONS

AUGUST 27, 2020

Percentage of Glazing: Street Facades



Percentage of Glazing: Bedford Street



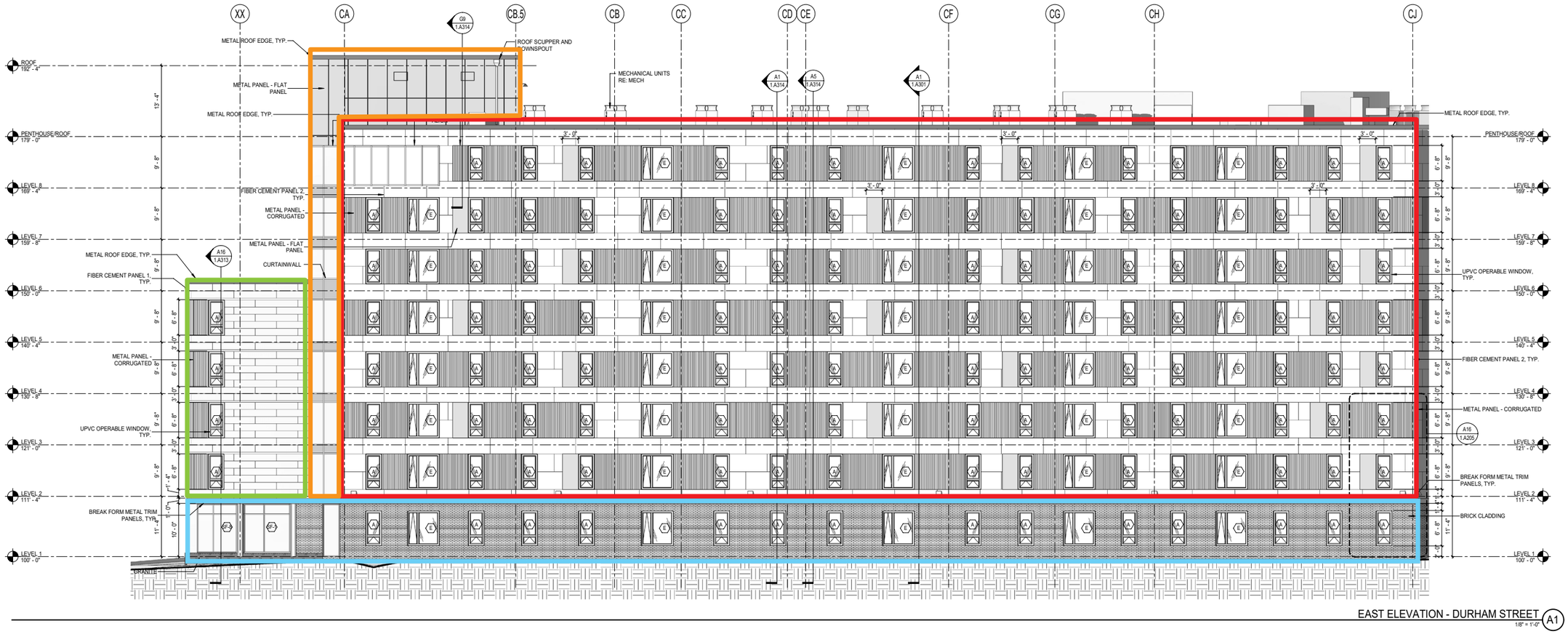
Note: Total Area taken from orthogonal view as outlined. Glazed openings that are not orthogonal to view have not been included in these calculations.

SOUTH ELEVATION - BEDFORD STREET J6
1/8" = 1'-0"

SOUTH ELEVATION - PARTIAL J1
1/8" = 1'-0"

		Total Area	Subtotal	Glazed Area	Subtotal	Calculation	
Upper Floors		8,310 sf	11,210 sf	1,840 sf	2,385sf	2,385/11,210=.212	Upper Floors: 21% Glazing Standard D-6 requires 15%-40% Glazing atUpper floors, This conforms as required.
		1,334 sf		425 sf			
		1,566 sf		120 sf			
Ground Floor		2,524sf	2,524sf	1,273 sf		1,273/2,524=.504	Ground Floor: 50% Glazing Standard D-6 requires 50% Glazing at Ground Floors. This conforms as required.

Percentage of Glazing: Durham Street



		Total Area	Subtotal	Glazed Area	Subtotal	Calculation	
Upper Floors		14,141 sf	16,019 sf	3,968 sf	4,444 sf	4,444/16019=.277	Upper Floors: 28% Glazing Standard D-6 requires 15%-40% Glazing at Upper floors, This conforms as required.
		930 sf		396 sf			
		948 sf		80 sf			
Ground Floor		2,700 sf	2,700 sf	668 sf	668 sf	668/2,700=.247	Ground Floor: 25% Glazing

Standard D-6 requires 50% Glazing at Ground Floors. This Area does not comply, however the residential program precludes an increase percentage of glazing.

University of Southern Maine (USM) Portland Campus

Transportation Demand Management (TDM) Plan

PREPARED FOR

University of Southern Maine
96 Falmouth Street
Portland, Maine 04103
(207) 228-8124

PREPARED BY

500 Southborough Drive, Suite 105B
South Portland, Maine 04106
207.889.3150

September 29, 2020

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1

Introduction

This Transportation Demand Management (TDM) plan provides a cohesive strategy for establishing and implementing a successful TDM program for the University of Southern Maine (USM) Portland campus. This plan seeks to enhance multimodal accessibility, ensure the use of non-vehicular modes, and discourage the use of driving through parking management, to achieve and build upon the parking demand reduction goals for the campus.

The TDM Plan expresses a TDM program of strategies and timeframe for when USM intends to implement the various strategies. The strategies aim at promoting walking and bicycling, improving transit service to promote ridership, promoting carpooling, changing time-of-day travel demands to eliminate or reduce vehicle trips, and managing parking demand via changes to USM's pricing and permit policies.

USM Portland

The University of Southern Maine (USM) Portland campus encompasses approximately 30 acres, with 27 buildings comprising 1,190,929 assignable square feet (ASF). Located less than one mile from the heart of downtown Portland, the Portland campus provides excellent access to social, cultural and internship opportunities. Linked to the Gorham campus ten miles to the west and the Portland city center via frequent bus service (METRO's Husky Line),

the Portland campus also has convenient access and visibility from Interstate Highway 295, with Forest Avenue serving as the primary roadway arrival point. A second important arrival point onto the campus is at the intersection of Deering Avenue, Brighton Avenue, and Falmouth Streets, soon to be transformed into a roundabout. Bedford Street bisects the campus providing access to most of the parking lots and garage for the campus.

The campus is in a completely developed urban neighborhood. The adjacent land consists of Interstate Highway 295 on the east, commercial uses on the north (along Forest Avenue), and residential uses on the west and south. The largest adjacent land use is the Oakhurst Dairy distribution center between the campus and Forest Avenue. The adjacent residential areas provide housing for some of USM's students but are generally a set of very solid and cohesive neighborhoods. Currently, no students reside on the Portland campus.

In 2017 and 2018, the University of Southern Maine undertook a process that resulted in a final *Facilities Master Plan* approval by the Board of Trustees in January 2019.[1] The process included information gathering via tours of all three campuses, extensive internal and external stakeholder interviews, and public input. The plan incorporates the visions, goals, facilities assessments, and the campus space needs assessments into a set of campus physical development recommendations. USM is now embarking in implementing specific capital projects identified in the plan.

Commitment to TDM

USM has a history of promoting Transportation Demand Management (TDM) strategies on its campuses. For starters, TDM clearly falls within two guiding principles of the University's Facilities Master Plan through its attempt to increase non-private vehicular transportation and reduce related transportation emissions:

- **Mobility**—the plan supports robust pedestrian, bicycle, shuttle bus, ride share and metropolitan and regional public transit systems that look beyond private vehicular parking to meet the transportation needs of the campus community.
- **Sustainability**—the plan supports all existing sustainability policies of the University.

TDM also indirectly relates to several other guiding principles as a result of potential outcomes from a TDM program:

- **Student Experience**—the process, plan and implementation focuses upon improving the students' academic, co-curricular and living experience on each of the campuses.
- **Public Safety**—the plan and subsequent implementation seeks to provide the safest campus environment possible through physical, programmatic and operational improvements, including those in response to public health threats like Covid-19.
- **Neighbors**—the plan seeks to establish campuses and campus communities that are positive members of the neighborhoods, mitigating negative impact and providing a beautiful and inviting campus landscape for all neighborhood members to enjoy.

[1] For more details, please visit *usm.maine.edu/president/master-plan*.

- **Aesthetics**—the visual quality of the campus facilities is important to creating an environment that meets the mission and goals of the University.

The implementation of TDM measures provides USM with the ability to make access to the campus more enjoyable and safer for affiliates (because of reduced traffic), improved relations with neighbors (because of decreased traffic and parking concerns), and decreased campus space dedicated to parking.

As a result, the University introduced TDM for the first time within its 2017 Sustainability Plan. The sustainability plan set a quantitative goal for sustainability efforts related to transportation and established a baseline of strategies to achieve that goal. Per the sustainability plan, the goal related to transportation was to reduce greenhouse gas emissions from transportation by 20 percent from a Fiscal Year (FY) 2006 baseline. TDM-related strategies suggested by the Sustainability Plan are presented in Chapter 3; one recommendation was to develop a TDM plan.

To further understand how TDM will play a role as the campus continues to transform, USM hired VHB to develop a comprehensive TDM Plan that will allow the University to meet their sustainability goals while responsibly meeting user parking demands (and limiting the additional parking supply requirements). To develop a strategic approach for USM transportation that leverages current realities in developing future outcomes, VHB and USM hosted a series of stakeholder meetings and interviews. These conversations helped inform the proposed strategies presented in this TDM plan.

Development Proposal: Facilities Master Plan Program Elements

Consistent with the USM *Facilities Master Plan* approved January 27, 2019, USM has several development program aspirations that have triggered the need to complete this TDM Plan. In the short-term, in the next three years, the University plans on embarking on building the new campus "heart", consisting of the following capital projects:

- **Career and Student Success Center**—This building will replace the dining and cocurricular activity space currently in the Woodbury Campus Center. In addition, the vision for this building is to provide a common place for programs and functions that support both the academic success and long-term professional success of the USM student. The building is anticipated to be approximately 56,000 square feet.
- **Student Housing**— This approximately 211,000 square-feet building will house upwards of 577 beds to accommodate upper class undergraduate students and graduate students.
- **"Quad"**—A key component of the transformation of the Portland Campus is a second campus open space, located adjacent to the residence halls and the Career and Student Success Center.

To accommodate parking needs for these uses, the master plan proposes increasing parking supply. (Actual proposed parking supply is based on a separate study produced in March of 2020 that shows the University will be short on parking supply at the opening of the new buildings even in a 0% enrollment scenario.)

The development noted above may be followed by the following capital projects, anticipated within five to ten years:

- **Graduate Center for Professional Studies**—A new Graduate Center is anticipated to accommodate and integrate three primary programs: The University of Maine School of Law, a University of Maine MBA Program, and possibly the Muskie School of Public Service. It is anticipated that the new facility will be in the range of approximately 160,000 gross square feet with a footprint of approximately 38,000-45,000 gross square feet.
- **Center for the Arts**—Serving both the needs of USM students and the community, this new 83,818 square foot facility would be a premier arts venue in Portland. Current plans call for a 850-seat theatrical performance hall and a 250-seat recital hall.

2

Mobility Context

Understanding the transportation context that is available for students, faculty, staff, and visitors at USM Portland is important to be able to recommend targeted TDM program elements. This section discusses in detail all the different ways that one can access the USM campus as well as opportunities and challenges related to those options.

Walking and the Pedestrian Environment

USM's Portland campus is located on the edge of the Portland peninsula adjacent to the Oakdale residential neighborhood. Oakdale maintains a grid of streets, a majority with sidewalks, and low-volume, low-speed streets that make it generally comfortable and conducive for walking. The University is also adjacent to Forest Avenue, which offers local retail (including a grocery shop) within a short walk of the University. *Walkscore.com*, a real-estate site that evaluates walkability and transportation when choosing where to live, scores

USM a 78 out of 100 and considers it to be a "Very Walkable" location where most errands can be accomplished on foot. Unfortunately for the University, both built and natural barriers limit accessibility to areas on the south side because of the I-295 highway, to the west and southwest because of a below-grade railroad, and to the northeast because of the Back Cove. Although the University is less than a mile from much of downtown Portland, I-295 adds an additional psychological barrier for walking trips to downtown. Figure 1 shows the walkshed in quarter-mile increments out to a mile from the USM Portland campus.

Figure 1: 1-Mile Walkshed from USM Portland Campus



On campus, there is a robust network of pedestrian paths that connect all campus buildings (Figure 2). There are also information kiosks and wayfinding to assist pedestrians in their orientation around campus.

Figure 2: Portland Campus Map



In summary, walking is easy in and around USM; however, natural or human-made barriers limit accessibility, particularly to downtown Portland. For example, the primary walk route to downtown from campus is on Forest Ave, which is a wide, fast street with large intersections and long wait times. The walking corridor crosses hazardous on and off ramps from 295.

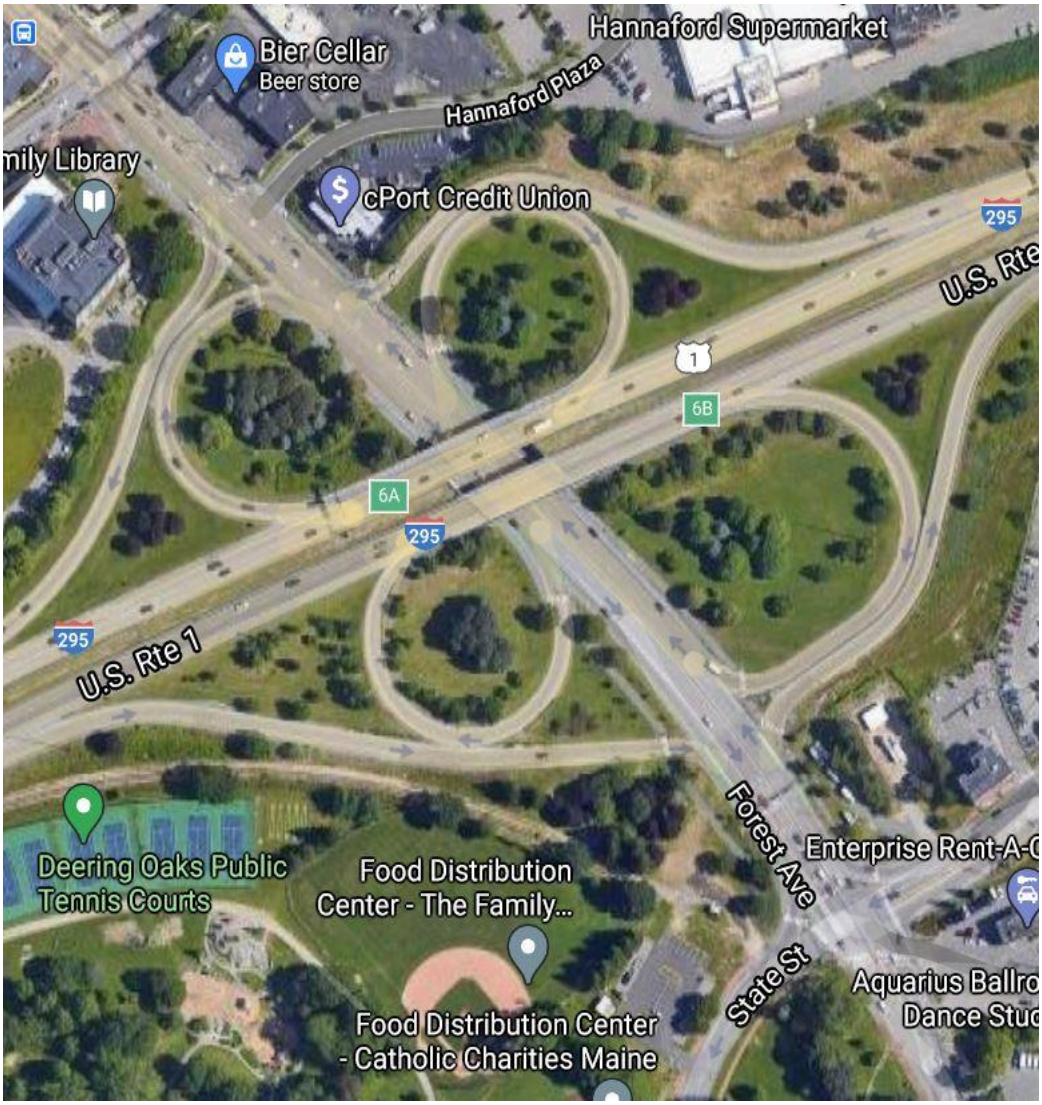
TDM strategies within this plan will seek to better connect the University despite these perceived or real barriers.

Bicycling Environment and Infrastructure

The *Walkscore.com* website lists USM at a Bikescore of 93 out of 100, the equivalent of a "Biker's Paradise." In fact, USM is located at the convergence of several key bike routes in the region that ultimately connect to the Portland Peninsula. Bike lanes around USM can be found along Brighton Avenue, Deering Avenue, Bedford Street, and Forest Avenue.

However, some of the bike lanes navigate treacherous area, most notably the one on Forest Avenue. In less than 1,200 feet, there are six intersections, on ramps, or off ramps on each side of the road. See the aerial image in Figure 3 below:

Figure 3: Forest Avenue Bi-Passing I-295



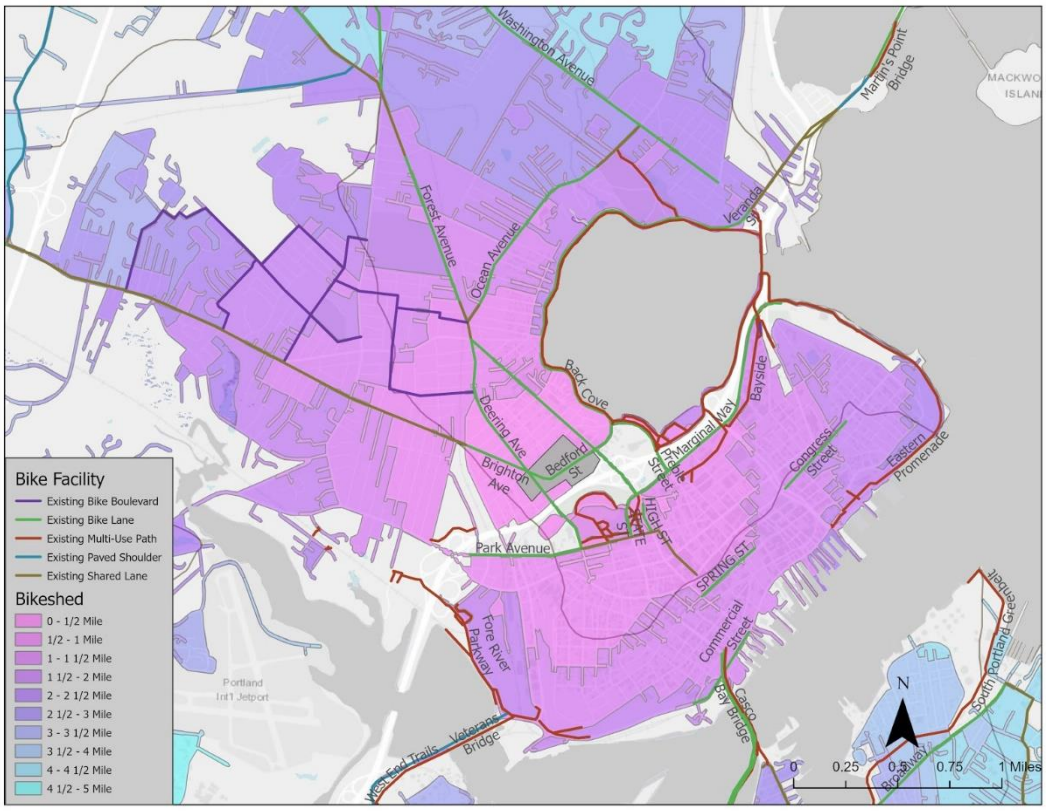
Thankfully, for less confident bicyclists, there is a wide sidewalk that can be utilized.

Figure 4: Crosswalk Available on Forrest Avenue to Cut Across I-295



There is also a multi-use trail that runs parallel along the Back Cove. Although somewhat limited by the aforementioned walking barriers, the entire Portland peninsula can be accessed within 2 miles of USM. Within 5 Miles, one can reach South Portland to the south, Westbrook to the west, and the border of Falmouth to the north. For the bike-to-transit trips, METRO buses serving the University are equipped with bike racks. The Husky line buses have slots for three bikes, and the other METRO buses serving the Portland campus have slots for two.

Figure 5: Bikeshed from USM



On-campus, there are 16 locations with bicycle racks and a bicycle repair stand adjacent to the Woodbury Campus Center. The locations of most of these racks are readily visible within the campus map (Figure 2) posted on kiosks throughout the campus and online. The majority of the racks are easily visible when on foot, except for the covered racks under Masterton's awning and in Abromson parking garage. The condition of the on-campus bicycle racks is fair; however, the Bike Fix-it Station needs repair: its tools have rusted and are bent and unusable. Shower access for campus affiliates is available at the Sullivan Gym. In order to gain access, they must show their campus ID.

In comparison to most places in the United States, the biking network in and around Portland and USM Portland campus is robust. On-campus, commuters have a place to store these bikes. In general, getting people to bike for their commute is difficult and limited to a group of bikers who feel confident to bike on the existing bicycle network. TDM strategies related to biking should focus on marketing this commute option and expanding the potential pool of people that can bike. The University should also collaborate with the City as they seek to expand and improve the bicycle network.

Public Transit

USM affiliates are granted unlimited free METRO transit access as part of their enrollment and employment at USM. Transit access is paid by way of the student transportation fee and

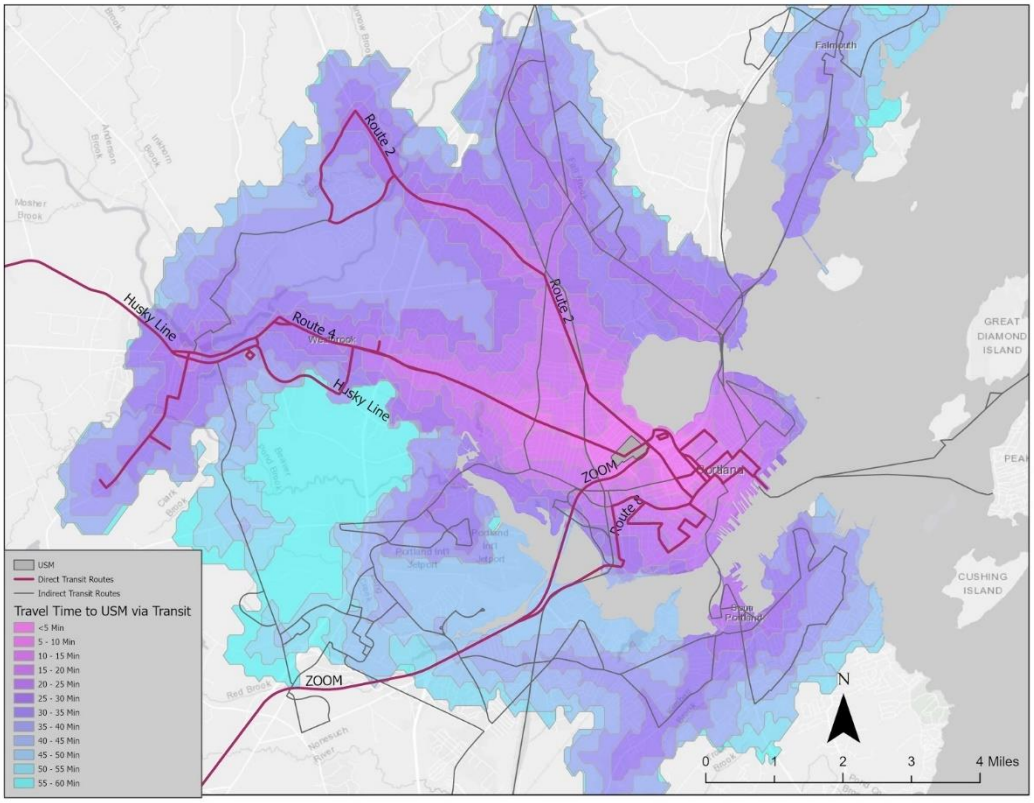
the employee parking permit fee. When boarding a METRO bus, USM affiliates must show their ID to the bus driver.

Four METRO bus routes serve the USM Portland campus: Route 4 and Husky Line serve the campus directly with a stop on Bedford Street, and within a quarter-mile, the Route 2 (via Forest Avenue) and Route 8 (at Hannaford Plaza). In addition to METRO service, the Lakes Region Explorer Bus ($2 one-way) is also nearby. Among the four, only the Husky Line has limited stop service all the way between the Portland and Gorham campuses.

On Bedford Street, at the heart of campus, there are shelters for Route 4 (Westbrook–Portland Pulse) and the Husky Line (USM Gorham via Westbrook–Portland Pulse). Route 2 (Forest Avenue) and Route 8 (Peninsula Loop) can be accessed at nearby Hannaford Plaza roughly a quarter-mile from campus. The Lakes Region Explorer (Windham Route), run by RTP, stops at the corner of Forest Avenue and Bedford Street.

Transit "accessibility" was determined by travel time including walk access (as opposed to walking and biking where distance from campus generally determines accessibility). Expected transit travel time to the campus using the existing Portland transit network was mapped out in 5-minute increments (Figure 6). These increments include up to a maximum of a 15-minute walk for the total trip (to account for walk-access to transit).

Figure 6: Transit Service at USM Portland



Transit is not only a function of having a service route present nearby; other important pieces to consider are its span of service (i.e., is the service available at the times of day when needed) and service frequency (i.e., does the service operate at frequent intervals). Scheduled headways and service hours for direct services are included in Table 1 below.

Table 1: Direct Transit Route Headways

Route	Headways (minutes)							Span					
	Weekday			Saturday		Sunday		Weekday		Saturday		Sunday	
	Peak	Day	Evening	Day	Evening	Day	Evening	Start	End	Start	End	Start	End
Bedford St USM (0.0 Miles)													
Husky	30	30	50	45	45	45	45	6:30 AM	10:30 PM	8:30 AM	11:00 PM	8:00 AM	7:00 PM
4	30	30	60	30	60	45	-	5:30 AM	11:30 PM	6:00 AM	11:30 PM	8:30 AM	7:30 PM
Forest at Bedford St. (<0.25 Miles)													
2	20	30	60	60	60	60	-	6:00 AM	11:00 PM	6:30 AM	10:30 PM	8:30 AM	4:40 PM
Lakes Region Explorer	180	180	180	-	-	-	-	6:00 AM	10:30 PM	-	-	-	-
Hannaford Plaza (<0.25 Miles)													
8	30	30	-	60	-	60	-	7:00 AM	6:00 PM	8:00 AM	6:00 PM	9:00 AM	4:00 PM
?													
Zoom Turnpike Express	30	-	-	-	-	-	-	6:00 AM	6:40 PM	-	-	-	-

While all transit services adjacent to USM operate during the schedule of a normal business day and into the evening, part of the challenge of getting USM affiliates to use these services is the lack of frequency. As one can see above, the most frequent transit service (Route 2) runs every 20 minutes while the Husky Line, Route 4, and Route 8 run on 30-minute intervals. At this frequency it is difficult to capture choice riders even if they had a direct transit route from their home to USM. These services do not offer "transit freedom" or the ability to travel without planning. ("Transit freedom", per the definition by Jarrett Walker in *Human Transit*, is a frequency of at least 15 minutes all day.[2])

Other Mobility

In addition to walking, biking, and riding transit buses, USM affiliates can use ride-hailing services Uber, Lyft, or taxis, which are readily available in and around the peninsula. No carshare vehicles are located within a half-mile of USM. Also, no dedicated carpool parking spaces are designated on campus. Carshare and carpool are opportunities that the TDM Plan can leverage to reduce the number of people parking on campus.

Parking Facilities and Policy

Campus affiliates and visitors can park at 11 distinct parking lots (including one garage) across campus hosting a total of 1,701 spaces (Figure 7). By far, the largest parking facility on campus is the University Garage, which has a total of 1,155 parking spaces. Lots are designated by permit type and only users with that permit can park in that lot. Figure 7 identifies the location of these lots, permitted users, and the total number of spaces. The campus also has dedicated spaces for handicap, service vehicles, and an electric charging station.

[2] Source: humantransit.org/2011/12/how-frequent-is-freedom.html

Figure 7: Parking Spaces at USM Portland



Note: Although the 1,155-space Abromson Garage is primarily for student and visitor parking, faculty and staff may use the facility. The garage is access-controlled by a revenue control system.

All vehicles in University of Southern Maine (USM) parking lots on the Portland campus must display a valid USM parking permit, which comes in the form of a hang tag that must be hung from a vehicle's rear-view mirror. Permits may be obtained from the parking office or online through the University's parking web portal.

USM Portland has the following permit types:

- Student (Commuter, Gorham Residential) – All students are given the same parking privileges on the Portland Campus
- Employee (Faculty, Staff)

On the Portland campus, students may park at three different lots during the day (designated by a green sign) and at a fourth lot only after 4:30 PM. All students pay a transportation fee if registered for on-campus courses. The fee varies based on the number of credits for which they are registered: between $55 and $110 per semester. These payments are mandatory as part of enrollment and are made each semester: fall, spring, and summer.

On the Portland campus, employees are allowed to park in eight different lots on campus (designated by a blue sign). They pay $25 annually for their parking permit, which needs to be renewed each calendar year.

Short-term visitors to the campus may park in the parking garage for $2 an hour between the hours of 7 AM and 5 PM, Monday–Friday. Outside of these hours, visitor parking is free. There is a charge for overnight parking, except during snow bans. Prospective students and their families, campus guests, visitors, and volunteers receive free validation by the office or department they are visiting. To pay for parking, visitors must pay at the Parking Garage Office or use the pay-on-foot stations located by the doors to the parking garage on the first and second floors of Abromson Center and the ground floor of the parking garage by the vehicle exit.

A violation of parking guidelines may result in any number of consequences, including a parking ticket fine, towing of a vehicle (and responsibility of the owner/operator for payment of related towing and storage fees), or suspension of campus parking privileges. Parking tickets range from $25 to $200 depending on the infraction. Students and faculty must pay outstanding tickets before picking up a new permit.

Parking at USM is relatively unconstrained. Typical parking activity is accommodated with the present supply. Although on-street parking is also an option, many of the streets adjacent or near the campus are metered or have 1- or 2-hour parking limits during daytime hours. Recent observations conducted by VHB for USM found approximately one third of the on-street parking spaces available during peak parking periods.

Remote lots have been considered, but a large portion of USM students have one or more off-campus jobs, which require them to have ready access to their vehicles. To be more effective at discouraging parking on-campus, the University plans to make the transactional cost of parking more apparent for students.

The University reviewed parking rates around the City and around the New England market in general to see if there was room to use increased rates as a leverage point. This influenced the University to go from charging $0 for public parking to $2, which is still on the low to medium end of the market. The University is considering raising prices again to possibly $3-$4. However, the current plan is to keep it free for the early evening hours (5-11 pm), and to help out the neighborhood by allowing them to park for free during for snow bans from the hours of 5 pm to 8 am the following morning.

Regional TDM Program

At USM's disposal are several regional, state, and national-level TDM programs and services that are intended to support programs such as the one being reviewed by USM. Among these potential programs/services that could support USM include:

GO MAINE: Run by the Maine Turnpike Authority, this state-wide program serves as a rideshare matching service as well as a platform to log any kind of non-single occupancy trips, including non-motorized trips. The range of services include the following:

- ***Emergency Ride Home***- This program essentially serves as "insurance" to provide people an option to get home from work in case of an emergency. The rides are provided using a taxi or Enterprise rent-a-car. It is available to commuters who carpool, vanpool, take transit, bike or walk at least three days a week. The benefit may be used up to eight times per calendar year.
- ***Way 2 Go Maine***- *Way 2 Go Maine* is an annual commuter challenge in October that encourages employees of local businesses to use alternative transportation options through an inter-company competition. The competition recognizes companies for their successful participation and distributes prizes such as gift cards and swag to encourage participation.
- ***Vanpool Matching***- Vanpooling is a common, long-distance commute option for employees headed to the same general area consisting of between 5 to 15 commuters. GO MAINE assists to form these vanpools.
- ***Rewards Program***- GO MAINE has a rewards program for individuals who take greener trips, which include walking, biking, telecommuting, carpooling, vanpooling, or taking public transportation. Participants must sign-up and log their commutes daily. Rewards include gift cards and discounts to various local businesses.

Portland Slow Ride: To get people comfortable with biking, the Bicycle Coalition of Maine offers the "Portland First Friday Slow Ride". These rides are typically done at a relaxed pace and coincide with Portland's "First Friday" art walk event.

Smart Cycling Traffic Skills 101 and Educational Courses: Traffic Skills 101 is hosted by the Bicycle Coalition of Maine and is a course that teaches new and experienced cyclists how to ride in traffic. An individual or employer can specifically request a safety workshop.

Discounted Helmets: The Bicycle Coalition of Maine runs a helmet purchase discount program: when purchased in bulk (8-30 helmets) the cost is $7 per helmet.

Bicycle Benefit: As part of this national program, local businesses offer rewards to patrons who arrive at their establishments by bicycle.

Cycling Savvy: Is a program of the American Bicycling Education Association aimed at helping communities become more livable and sustainable by promoting a civil and cooperative environment on roads through complementary education and infrastructure design.

Best Employers for Commuters: This membership program provides qualified employers with national recognition and an elite designation for offering outstanding commuter benefits.

TDM at USM

TDM related to increasing multimodal transportation is not a new concept for USM. In 2017, the Office of Sustainability worked with various campus stakeholders to develop an eight-year sustainability plan that set a quantitative goal for sustainability efforts related to transportation and established a baseline of strategies to achieve that goal. Per the

sustainability plan, the goal related to transportation was to reduce greenhouse gas emissions from transportation by 20 percent from a FY 2006 baseline.

Table 2 below identifies the original strategies pursued by the sustainability plan as well as current strategies that came as a result of this original proposal:

Table 2: Suggested TDM Tactics from Sustainability Plan

Category	Original TDM Strategy	Present Day (Fall 2019) Response
Shuttle	Extend shuttle routes and improve shuttle footprint	USM has partnered with the Greater Portland bus system, METRO, allowing students, staff and faculty to ride anywhere in the METRO system for free and vastly expanding the reach of University affiliates.
Carsharing	Explore option of starting a carshare program on campus	USM has explored options with one company and discussed ways it could fit into the vehicle fleet.
Comprehensive TDM Strategy	Create a Comprehensive Transportation Demand Management (TDM) strategy	This document is a product of the development of a comprehensive TDM Plan.
Bicycle Infrastructure	Create adequate bicycle infrastructure & education on campus to support people who would consider biking including a bikeshare program.	To accommodate bicycles, USM provides bicycle racks around the campus (16 racks & 250 spaces total). The Portland campus also has a fix-it work stand which is the first of its kind in Portland and allows riders to make simple bike repairs on campus. The University transportation website also highlights the benefits of biking from a health and environmental perspective.
Carpooling	Create adequate carpooling infrastructure & education on campus to support people who would consider carpooling	USM researched different carpool apps and began interviewing stakeholders to create a plan.
Hybrid & EV Vehicle Discounts	Create modest incentives for hybrid or electric vehicles	An EV charging station is provided at the parking garage and is free to use. Additional charging stations are being considered for the garage, Wishcamper, and locations in Gorham.
Incentive Program	Explore a partnership with Rise-Up to award incentives for alternative transportation commuting	The Office of Sustainability has held brainstorming sessions with the Wellness Committee to determine what types of incentives would qualify for the health credit. The Wellness Committee has agreed to work on implementation.
Carbon On-Setting Project	Explore possibility of creating a carbon on-setting project with local low-income households	No transportation related actions were identified. The Office of Sustainability chose a home weatherization project instead.

Category	Original TDM Strategy	Present Day (Fall 2019) Response
Sustainable Business Travel	Develop mechanism for incentivizing more sustainable business travel	Measured carbon footprint of business travel in order to establish a baseline.
Parking Enforcement	Create a parking enforcement division of the University, separate from Public Safety, in order to maximize space utilization of existing lots	Division was created, staff were hired, and enforcement began.

The responsibilities for implementing these strategies have largely fallen on the Parking and Sustainability Offices. According to USM, approximately 0.1 FTE is spent currently implementing TDM strategies, not counting parking enforcement which exceed 1 FTE by itself

The Plan found that it would be useful to conduct a Transportation Survey of campus affiliates to understand transportation patterns, needs and barriers. USM most recently conducted a transportation survey effort in Spring 2019, yielding over 1,000 responses related to current commute patterns, inter-campus travel, and receptiveness of possible TDM strategies.

Not listed within the Sustainability Plan, but nevertheless worth mentioning as TDM measures that have been pursued by the University include:

- Establishing a new USM transportation website to communicate the availability of alternative modes of transportation.
- Charging USM employees, students, and visitors for parking.
- Having a University System-wide telecommuting policy, which allows for telecommuting in certain cases. In response to the global pandemic, this policy has been broadened to incorporate more people for longer periods of time.
- Having a larger portion of online classes in response to the global pandemic.

3

Existing Transportation Patterns

By exploring how USM students, faculty, and staff are currently traveling to campus we can identify which alternative modes may have the greatest potential to reduce drive alone commutes, and save on trips, parking and carbon emissions. This investigation allows for the development of targeted TDM strategies that offer a greater degree of changing commuter behavior.

VHB has reviewed USM affiliates' travel patterns using two data sources: a transportation survey and registered permit data. These data help identify how people are commuting to campus, what modes of transportation may interest commuters, and finally, what types of strategies would be most beneficial towards encouraging alternative commute modes.

Transportation Survey: Mode Shares and Travel Behavior

The Transportation survey conducted in Spring 2019 was done as part of the University's sustainability effort to chart emissions related to transportation. The online survey asked about current travel patterns between home and USM and about travel between the USM campuses. The survey also included questions about one's receptiveness to certain TDM strategies. About 1,000 USM affiliates participated.

Some key findings related to the survey (pulled from the "Final Survey Summary" prepared by USM) include:

- 78 percent of the USM population reported driving alone at least once a week to campus from home. About 72 percent of the population drives 2+ times per week to campus.
- 94 percent of USM employees park on campus; 81 percent of students park on campus.
- 25 percent of commuter students ride the METRO bus
- Dedicated, preferential carpool spots were the highest ranked activity to encourage students to use an alternative mode of transportation
- Per the survey, a new bike would be the best buyout reward for a parking cashout program, which may be a function of it being the highest value option ($500) compared to less valuable options of $100 cash, $200 discount on carshare/bikeshare, $200 discount on carshare/scootershare, $150 gift certificate to bookstore, and $150 gift certificate to dining services.

Additional conclusions from the survey data for the USM population who indicated making a trip to the Portland Campus include:

- 72 percent of USM Portland population reported having driven alone at least once a week to campus, 66 percent of the population drive 2+ times per week alone.
- 14 percent of the USM Portland population reported have taken transit at least once a week, 11.5 percent have taken transit at least twice per week.
- Considering only USM Portland commute trips (of employees and students), the Portland campus mode split is as follows: Drive Alone: 73 percent; Transit: 6 percent; Walk/Bike: 11 percent; Carpool: 8 percent; Motorcycle: 2 percent[3]
- USM's Walk/Bike mode split of 11% exceeds the typical average of 3% among Universities across the country, including those who have implemented TDM programs, according to VHB
- Average One-Way Commute Distance: 13.8 miles.
- 56 percent of the USM Portland population travels to other campuses
- For trips taken between the Portland and Gorham Campus, 40 percent take transit, 37 percent drive alone, 20 percent carpool, 3 percent bike, 1 percent use a motorcycle

Commute Trip Origins Based on Parking Permit Data

USM provided VHB with anonymized home address data for all their parking permit holders, which allows for an investigation of opportunities for providing incentives for reducing drive-alone trips to the campus. The following figures shows the distribution of commute trip origins based on the permit data. Major clusters of population are centered around the City of Portland, Westbrook, Gorham, Lewiston-Auburn, Brunswick, and Sanford (Figure 8). Figure

[3] It is important to note that this survey was taken before the Covid-19 pandemic. The next survey may show considerably different percentages for transit and carpooling.

9 shows a zoomed-in version of the same data, showing that major residential areas include: Portland, South Portland, Westbrook, Gorham, Biddeford, Scarborough, and Yarmouth.

Using the parking permit data, VHB calculated drive time for faculty and staff. About 50 percent live less than a 20-minute drive from the Portland campus and 94 percent live within a 60-minute drive of the campus.

Figure 8: Distribution of Home (Commute Trip Origins) – Southern Maine Area

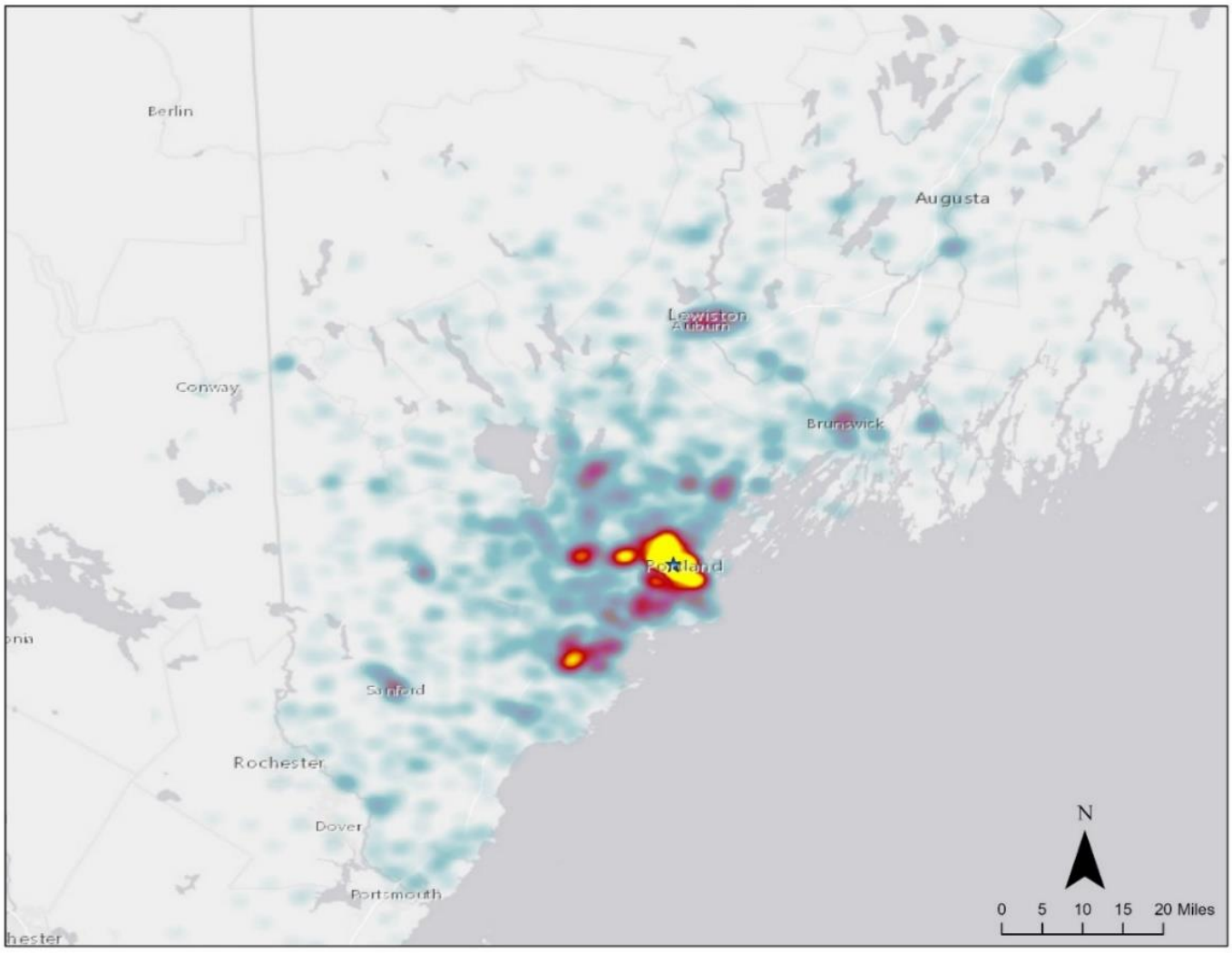
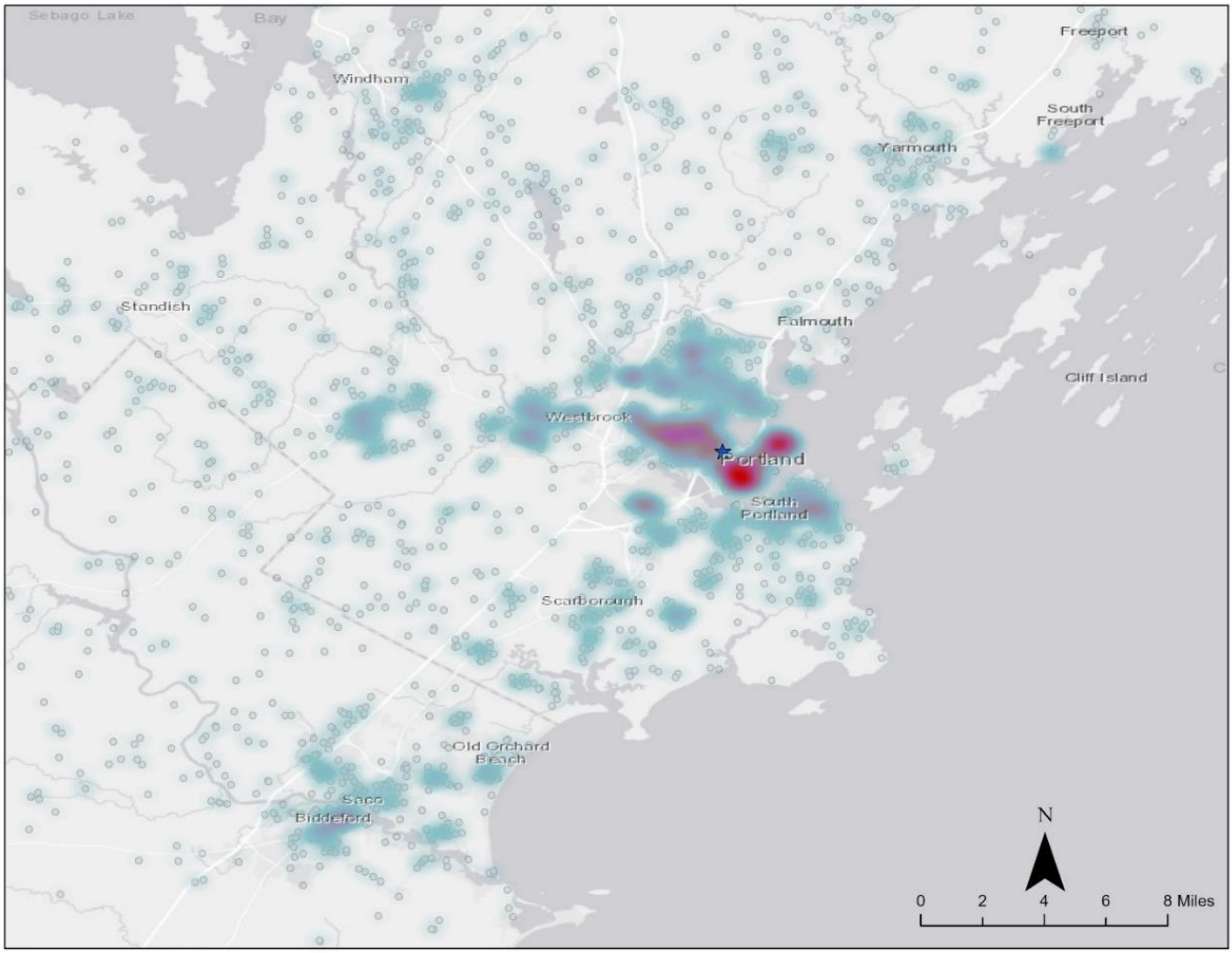


Figure 9: Distribution of Home (Commute Trip Origins) – Greater Portland Area



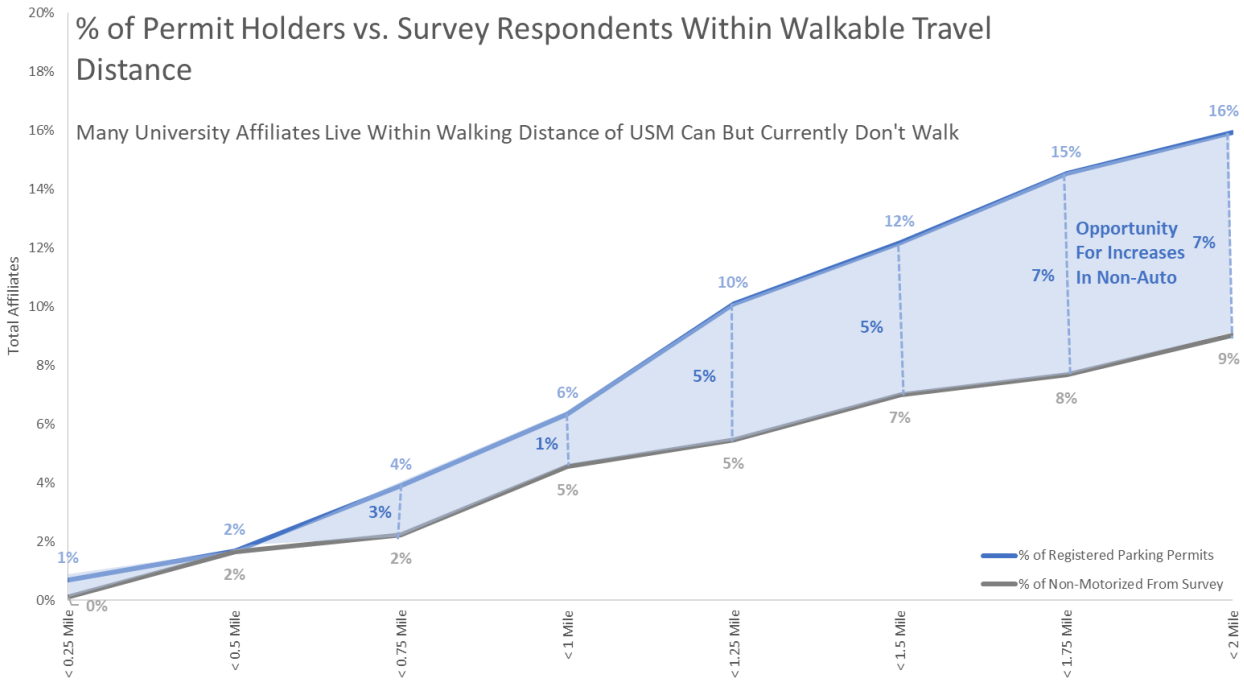
Alternative Mode Potential: Opportunities for TDM

To gauge the modal potential for walking, biking, and transit to USM, the geographic distribution of parking permit trip origin data was compared to the walking, bicycling, and transit travel market sheds. To get an understanding of current travel behavior versus potential travel choices, the 2019 transportation survey results are overlaid against this geographic distribution. The difference between the total number of people matched to a particular mode and the mode choice results from the survey form an "opportunity" zone for a potential increase in the use of a travel mode.

Walk Potential

Within a mile walking distance from campus, approximately 5 percent (an estimated 251 full-time equivalent individuals) of USM Portland students/employees reported using non-auto transportation to the USM Portland campus whereas per the permit data 6 percent of parking permit holders were geographically matched to reside a mile from USM (Figure 10). The delta between the two data points increases significantly as distance from campus increases. At 2 miles, only 9 percent of students/employees use non-auto travel modes (per the survey), whereas a total of 16 percent live within 2 miles of campus (per the permit data).

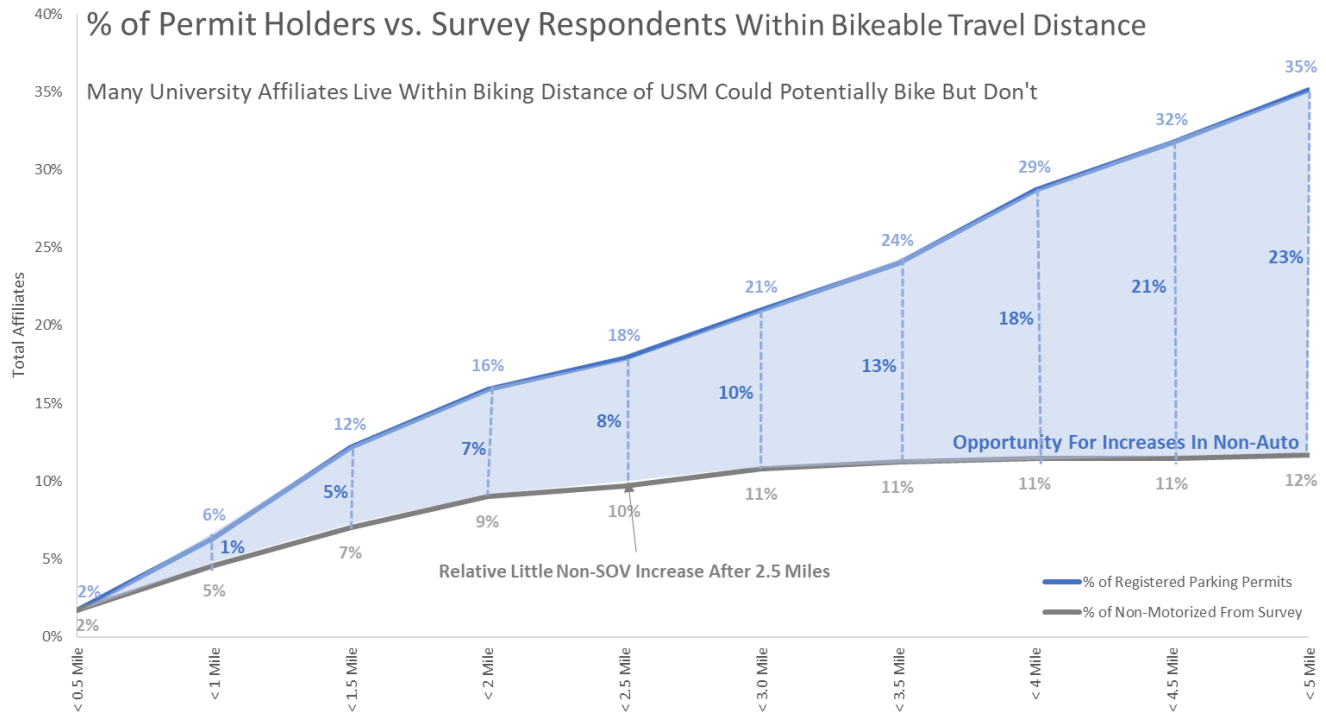
Figure 10: Walk Potential



Bicycling Potential

Biking distance for parking permit holders was compared to non-motorized users based on survey results (Figure 11). Based on the geocoded parking permit data, up to 35 percent of all USM employees and commuter students (an estimated 1,759 full-time equivalent individuals) live within 5 miles of campus, considered the upper limit for a reasonable biking distance for a commute. Per the transportation survey, however, only about 12 percent of commuters who live within 5 miles of campus use a non-motorized form of transportation. According to Figure 11, below, after 2½ miles, most people at USM stop using non-SOV[4] modes of transportation, which may be an indication of the cultural and environmental limits of biking in Maine. Although there is potential beyond 2 ½ miles, that potential should be tempered by barriers of safety, comfort, and weather.

Figure 11: Bike Potential

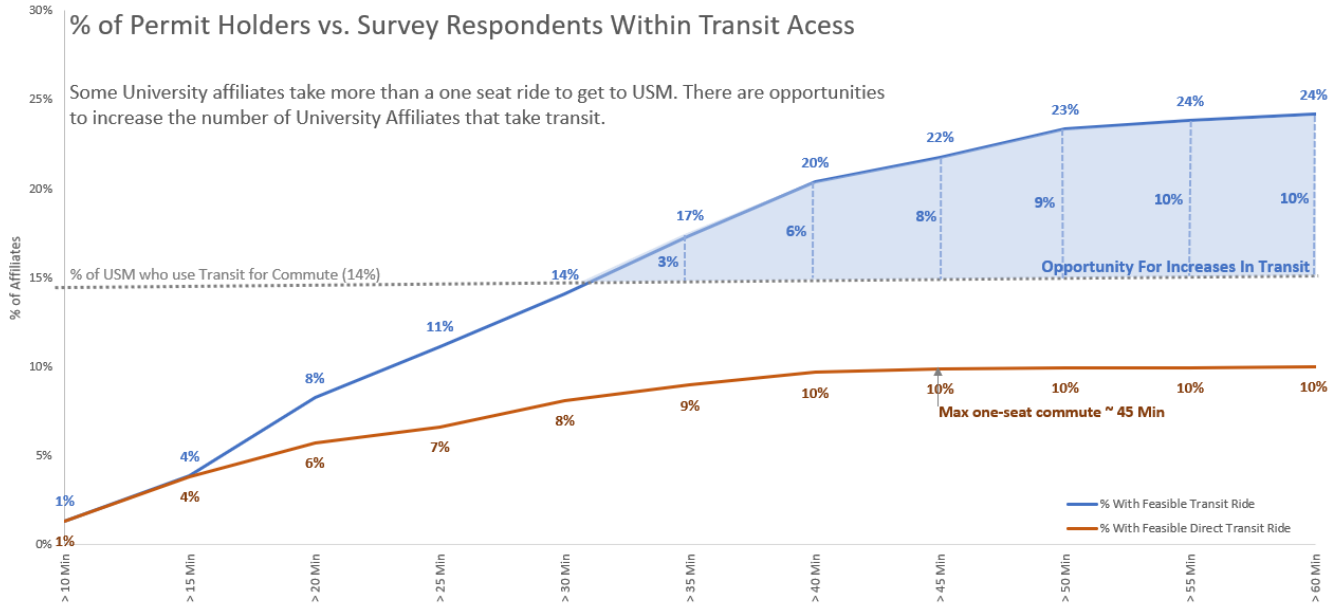


[4] SOV – single-occupancy vehicle (this mode is also referred to as *drive alone*)

Transit Potential

Transit-access time was compared to the percent of commuters from the survey who reported using transit (Figure 12). Up to 10 percent (or 503 FTE individuals) of USM affiliates live within walking distance of a direct transit route to USM Portland (based on the parking permit data). A further 14 percent (summing to 24 percent) can take a transit option that would take less than an hour to access USM Portland. This is 10 percent more than the existing number of University affiliates who indicated taking transit to USM (as reported in the transportation survey).

Figure 12: Transit Potential



Given the higher number of USM affiliates who noted taking transit than the number of affiliates within direct transit routes indicates that either a percentage of affiliates may be connecting on transit service or otherwise driving to a stop first (example driving to Gorham campus and then hopping on the Husky Line). Of all transit routes with direct access to the USM Portland campus, the Husky Line[5] has the highest number of permit holders who live within walking distance (459), followed by Route 4 (451), Route 2 (352), and Route 8 (270). Of all transit routes, the Route 9A and Route 9B serve the most affiliates within walking distance of stops (611), but these routes require a transfer to a transit bus line with direct service to the Portland campus.

[5] This analysis does not account for the fact that the Husky Line is a direct service route with few stops, whereas the other lines are more traditional services; however, the comparison serves to highlight what would be possible if the Husky Line or a route like it where to offer more stops in certain neighborhoods.

4

TDM Coordinator (TC)

TDM program management responsibilities will be designated to a single representative associated with the University.

USM will appoint Aaron Witham, Assistant Director of Facilities Management for Sustainability, as TDM Coordinator for USM; the Director of Auxiliary Services will play a supporting role.

The Assistant Director of Facilities Management for Sustainability can be reached via:

- email at aaron.z.witham@maine.edu
- phone at 207-780-5947.

The responsibilities of the Assistant Director of Facilities Management for Sustainability will include the following:

- Promote non-SOV transportation choices primarily to faculty, staff, students and residents
- Champion the implementation of new TDM strategies to reduce parking demand and increase the use of non-SOV transportation modes
- Conduct new student/new employee orientation to educate incoming affiliates regarding their transportation options to and from the campus.

- Coordinate the implementation of TDM strategies with Campus Scheduling, Human Resources, Parking, and any other departments.
- Work with the City of Portland, METRO, GoMaine, a private carpool app and other potential partners to improve non-SOV transportation access to the campus and to gain support for program implementation.
- Recruit and engage participants for any outreach events or campaigns associated with the TDM program over time.
- Review potential new alternative transportation technology or SOV reduction technology and coordinate implementation efforts associated with them.
- Coordinate all monitoring and evaluation activities necessary to measure the effectiveness of the TDM program in achieving the targets.
- Develop a TDM Report, which will provide an assessment of strategies implemented to date and outline the activities to be implemented in the upcoming year.

The responsibilities of the Director of Auxiliary Services will include the following:

- Provide consultation on TDM strategies that impact parking supply, services, and technology.
- Provide up-to-date data on parking volumes and patterns from the parking garage.
- Provide support for conducting additional parking assessments and measurements annually.
- Co-develop and implement financial parking incentives or disincentives as identified by the TDM plan.
- Maintain existing parking infrastructure and technology, with the support of Facilities Management and Capital Planning.
- Maintain parking services, including payments, campus notifications, and website updates.
- Carry-out parking enforcement.

5

Transportation Demand Reduction Goals

USM expects the TDM program to reduce the number of single-occupancy vehicle trips, thus reducing overall trips, demand for parking and greenhouse gas emissions.

Trip Reduction Goal: USM aims to reduce University-generated peak hour vehicle trips between 3-6% (17-35 trips) by 2025. This goal is relative to a future baseline of 2023, at the opening of Portland Commons, the Career & Student Success Center, and a new parking garage. It is a goal set in relation to the only USM-generated trip data that can be measured accurately: trips entering and exiting the existing Abromson parking garage and the forthcoming new parking garage. The peak hours occur twice a day and are considered to be between 7:30 am- 8:30 am, and also between 4:30-5:30 pm. They are based on total traffic in the area, inclusive, but not limited to USM's contribution. Given that the morning hour is a higher peak overall, this will be the primary focus of the goal.

Parking Demand Reduction Goal: USM aims to reduce parking demand by 10-14% (159-222 vehicles) by 2025 during the hour of peak demand on campus[6]. The peak parking hour and baseline volume was established from 12:30-1:30 pm, Monday- Wednesday, inventoried in the Fall of 2018. As strategies are implemented to achieve this goal, the peak demand

[6] The peak hour for trips is related to the peak hour for parking, but they are not the same. For example, the first peak hour for trips occurs early in the morning when the maximum volume of people are on the road traveling. The peak parking hour occurs later, reflecting cumulative impact as a result of multiple hours of trips coming to campus. This is why the trip reduction goal is smaller than the parking reduction goal.

hour may change, so the goal will stand in reference to the volume, not the time, of parking demand measured at the original baseline peak hour in Fall of 2018.

Greenhouse Gas Reduction Goal: USM aims to reduce greenhouse gas emissions from transportation by 20% (or .48 MT of CO2e per year per capita) by the year 2025. This goal is tied to a larger University pledge called the President's Carbon Commitment, a national commitment among hundreds of college and universities to reach carbon neutrality. USM signed the pledge in 2006, and set 2006 as the baseline with a goal of 2040 for carbon neutrality. Since FY 2007, per capita emissions from the commuting portion of transportation at the University have fallen by an estimated 4.9%, according to the last carbon inventory conducted in 2017[7]. The remaining 15.1% of the commuting sector's relative contribution to the transportation footprint is calculated to be easily surpassed by a combination of the trip and parking goals stated above and the anticipated increase in fuel economy of student, staff, and faculty vehicles. According to the 2020 Transportation Energy Data Book published by Oak Ridge National Laboratory[8], the average required fuel economy of the US fleet is expected to increase by 31.8% between 2019 and 2025. Surpassing this goal will help the University stay on track to hit the overall transportation reduction targets since the other sectors of business travel and study abroad are a little more difficult to reduce by the nature of serving as an increasingly nationally-known University.

[7] The FY 2019 carbon inventory is on track to be completed in December of 2020 and is expected to show that even further reductions have been made over the FY 2006 baseline.

[8] See Table 4.25 of https://tedb.ornl.gov/data/

6

Trip, Parking & GHG Reduction Strategies

The USM Portland TDM Plan establishes an aspirational vision and set of goals for transportation, mobility, and sustainability. The Plan builds off USM's multimodal strengths but pushes forward-thinking and multifaceted solutions.

Ultimately, USM will achieve success if one keeps in mind the following key concepts:

There is no "silver bullet" in TDM. The recommendations represent a package of reforms; implementing only one or two items will not solve USM's parking challenges.

Behavior change is difficult, but critical if USM would like to realize its vision. Future growth at the University will present critical challenges with parking. USM will need to depart from the status quo and rethink parking and transportation in order to grow sustainably.

The Plan is a "living" document. Key to the success of this plan is to implement, measure, learn, and adjust. Over time as the transportation context, technology, institutional culture, and user preferences change, so may the types of strategies that are pursued. This is true now, more than ever, given the current global pandemic, and the need to remain adaptable.

What is presented here is the University's current plan for Transportation Demand Management (TDM). It is subject to change as the global pandemic unfolds, as financial constraints dictate, and as annual survey data and parking counts inform what is working and what is not working among USM's unique population.

Therefore, the University is not committing to launch every one of these initiatives necessarily or committing to keeping every initiative in place permanently if they prove to not be feasible. Rather, the University is aiming to achieve trip, parking, and greenhouse gas emissions reduction targets using the most effective suite of technologies and policies available and achievable for a particular year. That said, it is the desire of the University to launch most of these initiatives in order to provide a multi-modal suite of options to students, staff and faculty, not all of which have the privilege of owning a personal vehicle.

The matrix below introduces a snapshot of the initiatives that USM hopes to implement. Following the matrix is a section outlining descriptions of these initiatives. To the extent possible, strategies are grouped by categories reflected in the *City of Portland's Technical Manual*. For each strategy, an anticipated launch date is provided.

Table 3: Overview of TDM Initiatives for USM

STRATEGY	LAUNCH DATE	INFRASTRUCTURE	INCENTIVES	EDUCATION
Walking				
Create Walk Spot Maps	Fall 2023			X
Publicize the "Complete City Project"	Fall 2021			X
Hold Fitness Challenges	Spring 2022		X	
Biking				
Co-launch City Bikeshare	Spring 2023	X		
Build Bicycle Repair Station	Spring 2023	X		X
Promote Local Bike Activities	Spring 2021		X	X
Offer Discounted Bike Supplies	Spring 2021		X	
Improve Bike Infrastructure	Spring 2023	X		
Apply for Bike Friendly University Certification	Fall 2022	X	X	X
Transit				
Propose Husky Line Improvements	Fall 2022	X		
Propose Transit Service Expansion Beyond Husky Line	Fall 2022	X		
Install Transit Screens	Spring 2023	X		
Carpooling, Telecommuting & Time-of-Day				
Establish Vanpool Vehicles	Fall 2022	X	X	
Designate Carpool/Vanpool Spaces	Fall 2022	X	X	
Develop Rideshare Matching Platform	Fall 2022	X		
Promote Telework & Flexwork	Ongoing		X	X
Restructure Course Schedule	Ongoing	X		

Parking Pricing				
Establish Commuter Parking Buyout Program	Fall 2021		X	
Establish Residential Parking Buyout Program	Spring 2023		X	
Host Carshare Program to Support Buyouts	Spring 2023	X	X	
Unbundle Student Parking Fees	Fall 2021		X	X
Build Additional EV Charging Stations	Fall 2021	X		
Review Parking Price Levels	Fall 2022		X	
Communications & Marketing				
Hold New Student & Employee Orientations for Transportation	Spring 2021		X	X
Revise Transportation Website	Spring 2021			X
Publish Access Guide	Spring 2021			X
Offer Guaranteed Ride Home Service	Spring 2023		X	

Walking Initiatives

Create Walk Spot Maps: Partner with a class and utilize GIS resources to create a semester-long project to build out exciting walking maps that would be made available both online and in print, in high profile locations on campus. The maps would include walkable points of interest, such as bus stops, public restrooms, cafes, breweries, scenic areas, and parks. The online version could be a user interface where you can select your points of interest and create a preferred route around the city. The online version should also include a forum, or a place for individuals to leave comments so they may spread information about the safest and most scenic routes, and also work to create a community of walkers.

This potential initiative program could also be made into a bi-annual "Walking Challenge" where individuals keep track of the various routes and enter that information into a type of raffle or other contest where they win a gift certificate to a sporting goods or shoe store.

Publicize "The Complete City" project: Participate in this project through a class or creation of a stakeholder group. The project is being run by the Portland Society for Architecture. They are reaching out to the Greater Portland community to make the area more accessible, more attractive, more just and equitable. This includes creating what they (and others) describe as "The Complete City," where within the city, each neighborhood has all it needs within a half mile, incentivizing alternative transportation by intentionally planning communities.

Hold Fitness Challenges: Partner with an existing health app or utilize the USM student app to create a fitness challenge for most steps per week. This will be accessible to most students, as most individuals have a smartphone that would be compatible with such an app.

Each week, the app could send out a public note of congratulations to the walker with the most steps. The app could also create benchmarks where if a member of the community reaches a certain number of steps in a certain number of days, they receive a percent discount code to a local sporting goods store or shoe store.

Biking Initiatives

Co-Launch City Bikeshare: Partner with the City of Portland to co-launch a Bikeshare program that will cover, at a minimum, the USM-Portland campus, the back cove, Oakdale, Brighton, Bayside and Parkside. The University will provide financial support for Bikeshare parking spaces on the Portland campus if necessary.

Build Bicycle Repair Station: Install a new student-run bike repair station or shop (deemed "the Hub") in a central part of their campus. Shop will be located in a corner of the Abromson parking garage, a stand-alone shed or some other covered location, where it can be out of the wind and the rain. The University aims to make it a social hub as well, where information about alternative modes of transportation can be offered. If survey data suggests additional need, then we can build a stand-alone self-service fix-it station near the center of campus.

Promote Local Bicycle Activities: Promote the participation in (and facilitation of) local bike activities such as the Portland Slow Ride, Smart Cycling Traffic Skills 101, and Cycling Savvy events. At least one opportunity or event will take place each semester.

Offer Discounted Bike Supplies: Provide Discount Sales for Bike Supplies (through a partnership with Bicycle Coalition of Maine or another program). Sales will either be ongoing in the bookstore and/or combined with the special events noted above once per semester.

Improve Bicycle Infrastructure: Improve bicycle infrastructure on campus, and propose improvements off campus. The University plans to increase bicycle parking spaces to 2.5 times what is currently offered on the Portland campus. Currently there are 250 spaces with another 10 being planned for the Wishcamper lot remodeling. Forty-one of these spaces are covered.

USM plans to add 122 short-term (uncovered spaces) to campus, with a lot of them slated for the new quod and some of them being distributed throughout campus to fill in gaps. USM also plans to add 288 long-term (covered spaces). Forty of these long-term spaces are proposed for a bike room inside the Portland Commons residence hall, and 248 long-term spaces are proposed for another location somewhere near Portland Commons and the Career & Student Success Center (CSSC). Possible sites include the new parking garage if it is located near the other two new buildings, in a stand-alone shelter, or in a secure area of the Abromson parking garage. In addition to spaces for personal bikes, the current plan is to offer dedicated spaces for the proposed bikeshare bikes.

These volumes of new bike parking meet or exceed several important standards that align with the University's aggressive plan to increase biking among its students, staff and faculty:

- 5.5 times higher than City of Portland's Technical Specs, campus-wide[9]
- Double the amount suggested by APBP for short-term parking for students & employees[10]
- Meets APBP's recommended long-term space allocation per bed[11]
- Exceeds City of Washington D.C.'s requirement by over 50% for long-term spaces per dwelling units in residential apartments[12]
- Double City of Cambridge, MA's requirements for short-term spaces and exceeds their requirements for long-term spaces.[13]

Off campus, the University will collaborate with the City of Portland on identifying improvements to bicycling infrastructure along corridors traveled by USM commuters through the annual transportation survey.

Apply for Bike Friendly University Certification: Apply for Bike Friendly University Certification. The application process, completed every four years, will help the University identify areas for improvement, and inform the types of questions that need to be asked in the annual survey of students, faculty and staff.

Transit Initiatives

Bus ridership has obviously been impacted by the global pandemic by some customers deciding not to ride the bus and by bus capacity being limited to comply with Federal standards. Despite these challenges, VHB believes that transit ridership demand will fully rebound again within a couple of years, so they do not recommend changes to long-term ridership predictions at this point. However, they note that the ability for ridership to be accommodated depends on supply of seats being available, which could possibly be impacted by future policy decisions coming from the Federal government. For the time being, the University is not adjusting expected transit impact for TDM goals set on a 2023 horizon.

Propose Husky Line Improvements: Conduct graduate-level research on how to increase ridership on the METRO using a community-based social marketing model. Then, make a proposal to METRO with goal of increasing the frequency of the Husky Line to 15 minutes to achieve "transit freedom."

[9] Per City of Portland Code of Ordinances, Section 14-526

[10] Per Association of Pedestrian & Bicycle Professionals' Bicycle Parking Guidelines, 2nd Edition, assuming that student & faculty vehicle spaces are a reasonable proxy for individuals on campus at one time

[11] Per Association of Pedestrian & Bicycle Professionals' Bicycle Parking Guidelines, 2nd Edition multi-family housing criteria of .5 spaces per bed

[12] Per Table 1: https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/DDOT%20bike%20parking%20guide_060118_Screen.pdf

[13] Per College or University Student Activity Facilities, page 4: https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/Bicycle_Parking_Guide_20130926_2017PictureEdits.pdf

Propose Transit Service Expansion Beyond Husky Line: Conduct graduate-level research, using GIS and USM student, staff, and zip code data to analyze route potential. Then, make a proposal to METRO for potential local on-demand bus shuttle connecting downtown Portland to campus and/or increasing the frequency on other non-Husky line routes that serve the Portland campus.

Install Transit Screens: Install real-time transit screens at high profile locations on campus. Candidates are the new parking garage and the Career & Student Success Center.

Carpooling, Telecommuting & Time of Day Initiatives

The initiatives below, when taken together, are some of the strongest leverage points the University has and some of the most nimble. They are paired together here so that they can be substituted for one another when responding to the risks created by the pandemic. For example, under non-pandemic circumstances, the telework and class schedule initiatives could constitute 50% of the demand management that this category is capable of, while under a pandemic scenario they may need to constitute 100% of the demand management. The aggregate goal for this collection of initiatives is to get 125 vehicles out of parking lots during the peak parking demand hour.

Establish Vanpool Vehicles: Establish a program to lease vanpool vehicles and initiative vanpools in high commuter corridors. A candidate for the first potential vanpool is a Lewiston-Auburn Campus to Portland Campus trip.

Designate Carpool/Vanpool Spaces: Designate prime parking spaces for carpool or vanpool on the Portland campus, starting with 50.

Develop Rideshare Matching Platform: Develop rideshare matching platform or meet n' greet events to pair potential carpool participants. University will consider using Go Maine if Go Maine can increase safety measures for student ridership. The University has provided Go Maine with feedback on how to improve safety.

Promote Telework & Flexwork: Establish teleworking arrangements with more employees, with options for full or part-time work and off-peak work.

Restructure Course Schedule: Conduct course catalog review with the goal of spreading out courses by day, time, and/or location. A first iteration of this initiative was started this Fall semester, but the effects of it are currently invisible due to the high percentage of classes being taught online due to Covid-19.

Parking Pricing Initiatives

Establish Commuter Parking Buyout Program: Launch a parking buyout program to encourage employee and student commuters to give up their parking pass in exchange for an incentive of upwards of $500 per year. Only individuals who previously purchased a parking pass the semester before may enter the buyout program. Buyouts would be offered on a first come, first serve basis. A max of 50 buyouts would be given out the first year (so

that the University can monitor and increase when/if effectiveness is proven). Ten emergency parking passes will be offered each semester, which gives individuals the right to park on campus if they have extenuating circumstances, such as childcare issues or emergent health challenges. Emergency passes could be printed from an online form that records number used per individual).

Establish Residential Parking Buyout Program: Launch a parking buyout program to encourage students residents on the Portland campus to give up their parking pass in exchange for a cash incentive, value toward a bikeshare subscription, and value toward a carshare subscription (if available). The value of each of the three incentives is proposed to be $20 per month, totaling $60 in value. The first 40 applicants would get secure, covered parking inside Portland Commons. The second 60 applicants could utilize secure, covered parking in the larger covered parking area in the vicinity. A max of 100 buyouts would be given out the first year (so that the University can monitor and increase when/if effectiveness is proven).

Host Carshare Program to Support Buyouts: Establish a carshare program in partnership with the City, that may be utilized as part of the residential student buy-out program (in subsidized form), or by commuter students, staff, faculty and non-USM community members. The University recognizes that the carshare business plan has been challenged by covid due to the financial losses sustained by car rental businesses, so this initiative may not prove reliable. To that end, it is not a critical leverage point within this TDM plan; rather it is supplemental to the buy-out initiative. The hope is that the industry will rebound by 2023.

Unbundle Student Parking Fees: Unbundle student transportation fee from their other tuition-related fees, so that the payment for a parking permit must be made separately through a manual opt-in program. This action which will draw attention to the cost of those applying and serve as a disincentive to some.

Build Additional EV Charging Stations: Install additional electric vehicle charging stations at select locations. Goal will be to ensure there are enough charging stations available to meet the next year's expected demand of staff & faculty driving EV vehicles to campus (as indicated by annual survey), so that spaces to park do not limit potential EV drivers. Stations are likely to be pay-as-you-go.

Review Parking Price Levels: Review of staff member parking to determine if there is a pricing model that will reduce transportation demand. Goal will be to achieve greater parity between employee and student parking pricing.

Communications & Marketing Initiatives

Communications & Marketing: Hold new student & employee orientations for alternative transportation modes, infrastructure, resources and incentives. This initiative may build upon current student and employee orientation programs to maximize participation.

Revise Transportation Website: Build upon current website (launched in May of 2019) by adding new & expanded alternative transportation options and benefits, and performing ongoing maintenance and updates.

Publish Access Guide: Develop a "slick sheet" access guide summarizing ways to travel to campus and nearby destinations.

Offer Guaranteed Ride Home Service: Promote a guaranteed ride home program from Go Maine or a private carpool app to compliment alternative mode use, and provide security to students, staff and faculty.

Potential Greater Portland Initiatives

The University recognizes that it is only one entity within a much larger complex system of transportation within the greater Portland. Toward that end, VHB researched potential improvements that could be considered by the METRO, the City of Portland, and other supporting entities to support USM's TDM plan. VHB also estimated the potential impact these initiatives could have on USM's trip generation and parking goals. The proposed initiatives and their potential impacts are summarized here:

- **Increase frequency of Husky Line to 15 minutes:** Reduction of 39 (2.5%) to 79 (5%) Peak Hour Parking Spaces
- **Increase frequency of METRO Routes 2 & 4 to 15 minutes**: Reduction of 39 (2.5%) to 79 (5%) Peak Hour Parking Spaces
- **Restructure departures and arrivals of all METRO routes serving the Portland campus in order to create 10 minute headways to downtown:** Reduction of 8 (0.5%) to 16 (1%) Peak Hour Parking Spaces, with even greater reductions possible if all routes were routed to serve the same stop on campus
- **Create local on-demand circulator route (shuttle):** Reduction of 56 (3.5%) to 111 (7%) Peak Hour Parking Spaces
- **Improve downtown METRO loop (Route 8) & route it through the USM campus:** Reduction of 43 (2.7%) to 86 (5.4%) Peak Hour Parking Spaces
- **In support of the above initiatives, METRO could begin to plan around USM as an anchor node in their network when the new residence hall comes online**
- **Create a better defined & safer bicycle/pedestrian corridor from USM to downtown:** Reduction too difficult to estimate until the goal is more defined

7

Monitoring and Reporting Plan

Program monitoring and evaluation are important components of any successful TDM Program, because they provide a quantitative benchmark of the program's effectiveness in reducing single occupancy vehicle trips and parking demand. The Transportation Coordinator (TC) can use the information gathered via the monitoring plan to direct the ongoing implementation of the TDM Program, allowing for adjustments and the introduction of new strategies. Furthermore, via regular periodic reports, USM will provide evidence to the City of the applicant's diligence in implementing the program.

There are different methods for collecting the data necessary to monitor a TDM Program, including surveys, program participation documentation, vehicle parking counts, and activity logs. USM's TDM program monitoring will use vehicle parking counts and person surveys in evaluating the effectiveness of the program. Each of these tools is discussed below.

Trip Generation Counts

Trip generation counts refer to estimating the potential contribution of USM students, staff, and faculty to the total volume of vehicles on the roads feeding the Portland campus. The peak trip hours will be used as the boundary for this metric, and the data will originate from recorded vehicles entering and exiting the parking garage structures on campus (as these structures represent the only automated count system the University has at this time. The peak hours will be assumed to be between the hours of 7:30-8:30 am and 4:30-5:30 pm, Monday through Wednesday, in October, unless future analysis shows they should be at a different time.

The Director of Auxiliary Services at USM will provide vehicle count data from the automated garage entry systems to qualified University staff or a third-party contractor to analyze.

Parking Occupancy Counts

Parking counts refer to a visual or automated account of occupied and/or empty parking spaces. These data are used to ensure that the amount of parking supply (spaces) on site is appropriate to meet peak hour parking demand (parked vehicles).

Under the direction of the Transportation Coordinator, the university will collect observations of vehicle parking during a representative (typically busy, classes-in-session) 3-day period in October. The TC will report the peak parking demand for the campus parking for those observed days.

Parking occupancy of the campus's garages will be based on data retrieved for the parking revenue control system, whereas occupancy of the campus's surface parking lots will require manual field observations. Observations of spaces occupied will be made during each hour in a ten-hour period of 8:00 AM to 6:00 PM.

The reporting of parking transactions and garage use should distinguish, to the extent possible, those users who are USM employees, students, and transient/visitors (hourly, public) users.

A parking occupancy rate relative to total supply of parking on campus will be reported.

Commute/Travel Survey

The Transportation Coordinator will administer a survey of both employees and students of USM Portland.

Surveys provide a qualitative understanding of how well TDM (and Parking Management) program elements are working. The survey will also be used to estimate greenhouse gas emissions associated with commuting.

The TC will conduct the surveys in either the spring or fall session (e.g., March or October), depending on available resources and labor relative to the resources and labor required to conduct the trip generation and parking analysis. The survey will be completed during a week without any holidays and when classes are in session.

Survey questions will incorporate the following components, in addition to others:

- Type and frequency of modes of transportation used in a typical week
- Destinations traveled to via particular modes
- Reasons why people are driving alone
- Reasons why people are not driving alone
- Level of enthusiasm for incentives that would encourage drive-alone respondents to use an alternative mode
- Ideas for improvements to transportation system, including ideas for incentives
- Routes traveled by foot or bike & associated improvements desired
- Trip generation during time of day (in order to supplement USM-generated contribution to peak traffic generation)
- Ownership of elective vehicles
- Questions required for Bike Friendly University application
- Questions about health concerns (e.g. Covid-19) with different modes and how that is impacting behavior and expected to impact behavior in the future

Status and Monitoring Report

Each year, after data are conducted, the TC will prepare a report summarizing TDM program status and monitoring results. In addition to reporting the results of the data collection, the report will detail (1) what/when strategies were implemented, (2) an estimate of how many individuals participated in certain programs, (3) the lessons learned regarding the most effective TDM strategies, including barriers to not driving alone from the survey.

The TC will submit the report to the City of Portland's TDM Program Manager (a position currently staffed in the Planning and Transportation Division of the Planning and Urban Development Department). A report should be issued within 3 months following the last of the three data collection activities (e.g., if the survey is done in March, then a report should be issued no later than June of that same year). The TC will meet with the City of Portland Planning Department and discuss suggestions for changes to the TDM Program, and will make adjustments before the start of the Fall semester.

Monitoring Schedule

Monitoring (survey, parking, and traffic data collection) should begin within the year following the opening of the planned residence hall. Monitoring will occur according to the schedule detailed below, until the year 2030, the horizon year of the *Facilities Master Plan*. Updates to the *Sustainability Strategic Plan* may conclude that further monitoring is warranted.

- Annually:
    - Conduct analysis of trip generation (as described above)
    - Conduct parking occupancy observations (as described above)
    - Conduct a travel survey (as described above)
    - Prepare a TDM monitoring report (as described above)

University of Southern Maine

Traffic Movement Permit - Section 7

Proposed Residence Hall, Student Center, and Parking Garage

October 2020

Introduction

This Traffic Impact Analysis is provided as Section 7 of the Traffic Movement Permit (TMP) application for the proposed residence hall, student center and parking garage on the Portland campus of the University of Southern Maine (USM). This analysis incorporates comments received at the project Scoping Meeting that was held virtually on August 6, 2020.

The project consists of a 580 bed residence hall, a Career and Student Center, and up to a 500 parking space parking garage. The 580 bed residence hall will be located on the corner of Bedford Street and Durham Street. The new Student Center will be located to the west of the residence hall, set back from Bedford Street. Vehicular access for loading will be provided to the sites via a lot off of Durham Street. Pedestrian access to the dormitory will be via a front entrance on Bedford Street, an entrance on Durham Street and an entrance across from the Student Center. The main entrances to the student center will face the lawn towards Bedford Street with an additional entrance to the rear of the building.

The residence hall and student center are part of a project currently undergoing permitting from the City of Portland. Although the parking garage is not currently part of a City permit application, the parking garage is a part of this TMP application as it is expected to closely follow the permitting of the residence hall and student center. For the purposes of this analysis, the parking garage will likely be located on the site of the existing Sullivan Gym lot, between the Student Center and Falmouth Street with a parking supply between 400 and 500 spaces. A project location map can be found in Attachment 7A.

Existing Condition

Existing Traffic Volume Data

The area around USM has been the subject of significant transportation analysis and study. The City of Portland has studied intersections on the west side of the campus as a part of the Deering Roundabout project. The intersections to the east, along Forest Avenue, were studied as a part of the *Portland-South Portland Smart Corridor Plan* project. Historic information was collected where available.

Current turning movement count data was initially collected at the study area intersections of Forest Avenue at Bedford Street; Forest Avenue at Falmouth Street; and at Falmouth Street, Brighton Avenue and Deering Avenue. Traffic data was collected on Tuesday February 25, 2020 when both USM and local Portland schools were in session. The weather was cloudy and approximately 40-degrees. Data was collected during the typical peak commuter peak periods, 7:00 to 9:00 AM and 4:00 to 6:00 PM. The peak hour occurred from 7:30 to 8:30 AM and 4:30 to 5:30 PM at the three study area intersections. The appropriate adjustment to result in the 30th highest hour of the year was researched using the weekly mean factors published by MaineDOT based on the classification of the roadway: urban, arterial, recreational, or a mixture of the three. As a result, the raw volumes collected in February 2020 were adjusted by a factor of 1.02, the weekly mean factor, and 0.89, the highest volume week factor.

Additional data was collected for the intersection of Bedford Street and Deering Avenue from the Deering Corner Roundabout project. Finally, 2019 Inrix data was obtained for the intersections of Falmouth Street at Oakdale Street and Bedford Street and Deering Avenue. The Inrix data for these two intersections was added to the 2020 Adjusted volumes network and balanced. All traffic volume data is provided in Attachment 7A.

In addition to seasonally adjusting the traffic volumes, to account for background traffic growth, the volumes were also increased by one percent per year to a future horizon year of 2023 when the proposed project is anticipated to open and to 2028, a five year horizon after the project opening.

Crash Summary

A review of MaineDOT's most recent High Crash Location (HCL) Report (2017-2019) revealed that two intersections within the project study area are classified as HCL by MaineDOT[1]. MaineDOT uses two criteria to define HCLs. Both criteria must be met in order to be classified as an HCL:

- A critical rate factor (CRF) of 1.00 or more for a three-year period. A CRF compares the actual crash rate to the rate for similar intersections in the state. A CRF of less than 1.00 indicated a rate of less than average and:
- A minimum of eight crashes over the same three-year period.

MaineDOT identified two locations in the site vicinity as an HCL, the intersection of Falmouth Street at Deering Avenue and Brighton Avenue and the intersection of Forest Avenue at Bedford Street and Baxter Boulevard. The intersection of Falmouth Street at Deering Avenue and Brighton Avenue is currently being reconstructed as a roundabout in order to reduce the number of crashes at this location.

Maine Public Crash Data Query Tool[2] was reviewed to further investigate reported crashes occurring over the most recent three-year period in the vicinity of the project. The crashes occurring at the study area intersections are summarized in **Table 1** below. The high crash location reports can be found in Attachment 7B.

1 MaineDOT Public Map Viewer Tool. https://www.maine.gov/mdot/mapviewer/. Queried 09/8/2020.
2 Maine Public Crash Query Tool. https://mdotapps.maine.gov/MaineCrashPublic/Home. Queried 07/8/2020.

Table 1: Crash Summary

		Crash Severity			Crash Type					
Intersection	Total	Fatal	Injury	PDO	Rear End or Sideswipe	Intersection Movement	Went Off Road	Ped	Bike	Other
Deering Avenue Brighton Ave Falmouth St**	22	0	5	17	20	1	1	0	0	0
Forest Ave Bedford St Baxter Blvd**	46	0	15	31	36	8	2	0	0	0
Falmouth St Forest Ave Preble St	20	0	3	17	12	6	0	0	1	1
Oakdale St Falmouth St										
Deering Ave Bedford St	2	0	1	1	2	0	0	0	0	0
Durham St Bedford St	3	0	1	2	2	1	0	0	0	0
Durham St Falmouth St	2	0	0	2	2	0	0	0	0	0
Access on Bedford St	4	0	2	2	1	1	0	1	1	0
Access on Durham St										

Note: There were no fatalities at the above HCLS.
** HCL

As indicated above, based on the MaineDOT Public Query Tool and the MaineDOT Public Map Viewer for HCLs, the only HCLs in the vicinity are at the intersection of Falmouth Street at Deering Avenue and Brighton Avenue and the intersection of Forest Avenue at Bedford Street and Baxter Boulevard. Mitigation measures in the form of a roundabout are currently under construction at the intersection of Falmouth Street at Deering Avenue and Brighton Avenue. The intersection of Forest Avenue at Bedford Street and Baxter Boulevard has a high instance of rear end collisions. Potential mitigation could include signal timing modifications including optimization of the clearance intervals or signal coordination of the adjacent intersections.

There have been two crashes involving a bicycle and an additional crash involving a pedestrian in the past three years at the student center driveway. Both crashes resulted in a non-fatal injury. Measures have been installed recently to alert drivers' attention to the presence of pedestrian crossing locations.

Historic Context on University of Southern Maine Campus

University of Southern Maine has last participated in the Traffic Movement Permit process in 2006 when the application was submitted for the Wishcamper Center. As a result, the enrollment changes on the campus since that time were investigated. As shown in **Table 2** below, the enrollment in both full time equivalents, as well as, full student numbers peaked in 2006 with 8,949 full time equivalents and 7,348 full time students in the USM system. The enrollment reduced to a low of 5,681 full time equivalents in 2016, but has been increasing in recent years. In academic year 2019-2020, the number of full time equivalents was 6,123 students.

Table 2: University of Southern Maine Enrollment

FY	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
TOTAL STUDENTS - FTE	7348	7180	7157	7035	6971	7051	6764	6871	6462	6083	5681	5713	5894	6123

1. FTE - full time equivalenrts

Future Condition

Roadway Infrastructure

As indicated above, the study area has been the focus of significant transportation analysis and infrastructure improvements. The future conditions for the study area include a significant infrastructure change at the intersection of Falmouth Street, Brighton Avenue and Deering Avenue. Beginning in Spring 2020, construction began at this signalized intersection to create a roundabout. As shown in **Figure 1** from the City of Portland website, the eastern leg of Brighton Avenue will be discontinued, and the traffic redirected to the southeast Deering Avenue leg of the intersection. The remaining five legs of the intersection will form the new roundabout. For future conditions analyses, this intersection will be analyzed as a roundabout in all scenarios.

The traffic volume data collected at the intersection of Falmouth Street, Brighton Avenue and Deering Avenue was redistributed to represent the volumes that will exist at the five-leg roundabout in the future, rather than the current six-leg condition.

Figure 1: Proposed Roundabout at Falmouth Street, Brighton Avenue and Deering Avenue (City of Portland)



In addition to the impending improvements at Falmouth Street, Brighton Avenue and Deering Avenue, the *Portland-South Portland Smart Corridor Plan* evaluated alternatives for improving traffic operations along Forest Avenue. In the vicinity of USM, those improvements included improving accommodations for cyclists and shortening pedestrian crossing distances by narrowing travel lanes and shortening turning radii.

As a part of a DPW water resources project, striping changes have been incorporated to better serve cyclists at these intersections and adaptive traffic signal control is being implemented. This technology will allow for a more responsive signal system that, for example, ends green time for approaches that do not have traffic on them and lengthens green time for approaches with additional demand. For the purposes of the analysis, the signal operations from the *Portland-South Portland Smart Corridor Plan* were field checked and used as a baseline operation.

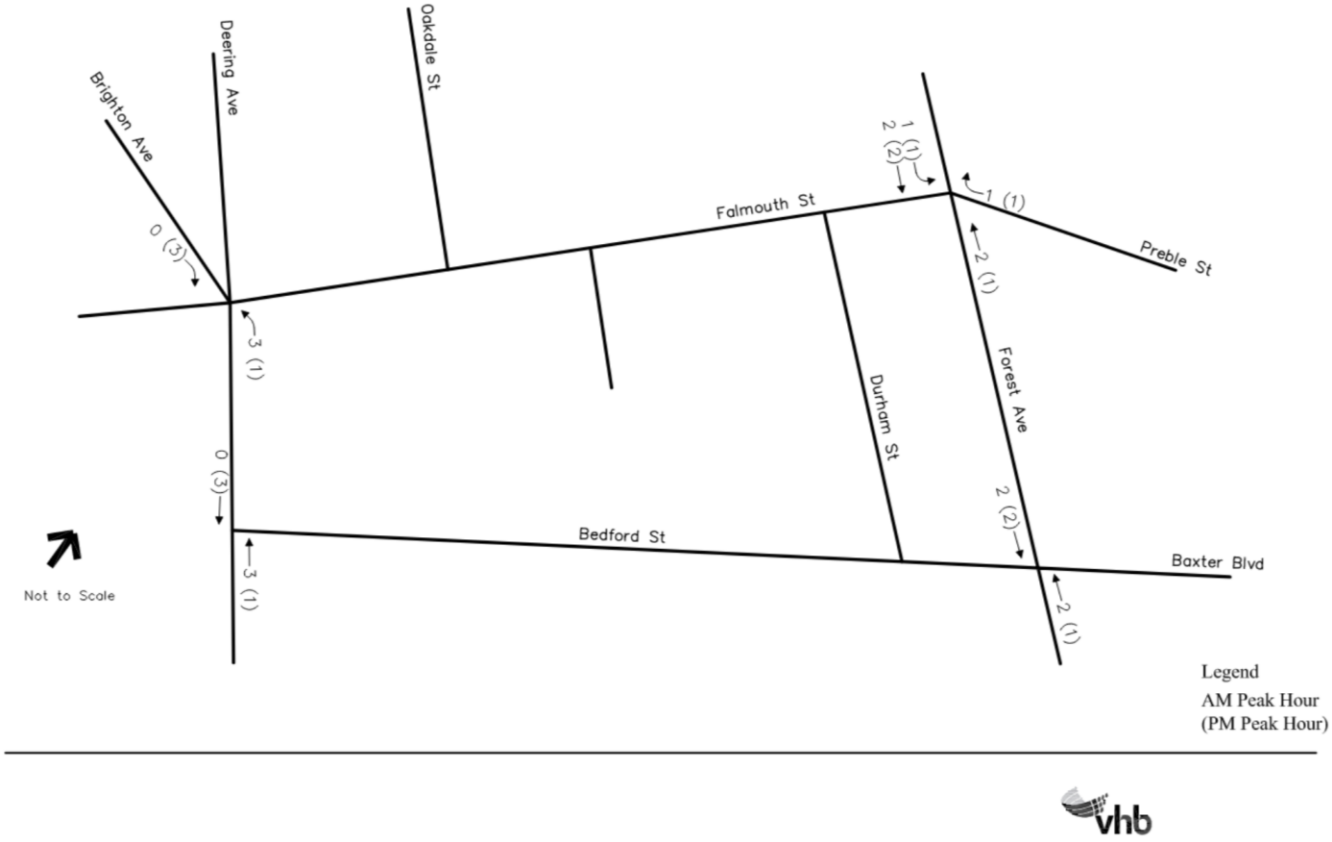
Other Developments in the Vicinity of the Site

Projects that have been approved but are not yet occupied as well as projects that have applied for approval are required to be included in the predevelopment traffic volumes. City of Portland staff have indicated that the traffic from the following projects should be included in the background traffic for the project. A map of the locations of these projects is provided in Attachment 7C.

- 132 Marginal Way (Bayside Village conversion) (PL-000709-2019). This building appears to be occupied. The submission for this project indicated approximately the same number of trips existing and proposed.
- 191 Marginal Way TMP (PL-001137-2020) This commercial development has been constructed but the Dunkin and other tenants have not occupied. With a Dunkin, and other small commercial uses, based on the trip assignment, there are minimal new trips distributed to the network to impact near USM.
- 104 Grant Street (PL-000960-2020) This 23 residential unit building is under construction and vacant. The trip generation for the entire building is approximately 15 trips during the peak hour and based on location, a minimal number of trips may pass near USM along Deering Avenue.
- 510 Cumberland (PEZ-2017-132) The 33 new units (total 80 units) subsidized housing are currently under construction. Similar to Grant Street, this will include a low trip generation and even lower trips will pass by the USM study area via Deering Avenue.
- 58 Parris St. (PEZ 2017-287) has been constructed and has been occupied.
- 178 Kennebec (PL-000029-2018) The 46 unit condominium is under construction. Based on its location, a small number of the approximately 20 peak hour trips may use Forest Avenue past USM.
- Maine Med projects. Based on a review of the Maine Med projects, the parking garage for employees was the significant project listed. This garage is constructed and being used.

The traffic anticipated to be generated by these projects is illustrated in **Figure 2**.

Figure 2: Site Specific Development – Trips



Future No Build Condition

The traffic associated with the background developments was added to the intersection traffic volumes increased to the future horizon years. The volumes at the intersection of Falmouth Street at Deering Avenue and Brighton Avenue were redistributed to represent the configuration proposed in the roundabout. The resulting Fall 2023 and Fall 2028 traffic volumes are illustrated in **Figure 3** and **Figure 4**.

Figure 3: 2023 No Build Traffic Volumes

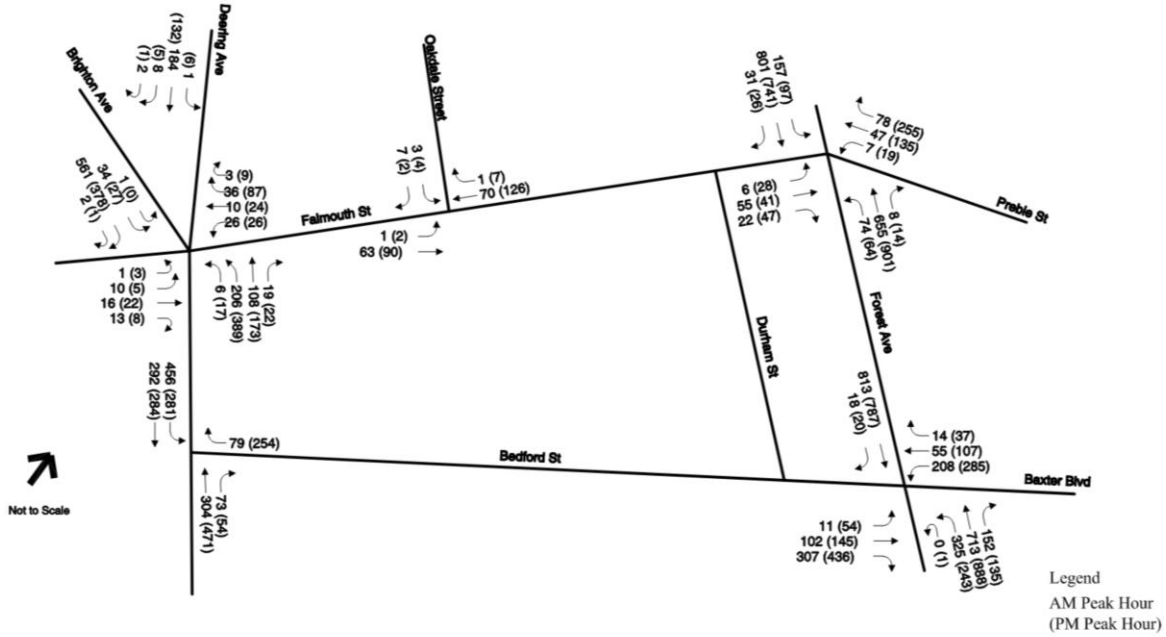
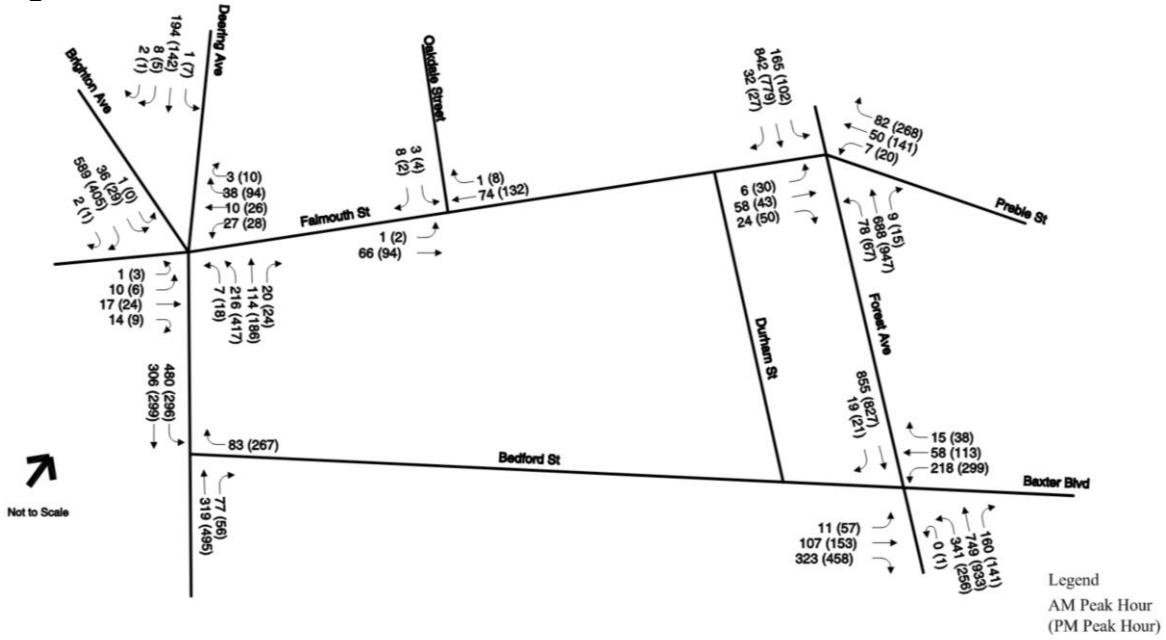


Figure 4: 2028 No Build Traffic Volumes



Trip Generation

The trip generation for the site was calculated based on the Institute of Transportation Engineers (ITE) publication, Trip Generation, 10th edition[3].

The proposed project includes the following uses:

- 580 bed residence hall,
- Career and student success building,
- Up to 500 space parking garage,
- An anticipated 1,066 student increase in enrollment by 2028 across the USM footprint.

Adding residential beds to a campus typically will reduce vehicle trips if enrollment is expected to remain the same. A portion of the student body who were previously commuting to and from the campus each day, now will reside on-campus and walk to classes. The students with cars will occasionally use them to drive to recreation or commercial establishments and others may get vehicular deliveries or visitors, but the reduction in the typical peak hour trips is usually significant.

The proposed Student Center is not expected to generate a significant number of trips as it is an expansion of an existing use on the campus and is expected to continue to serve the student population. With the improved facility, it is possible that additional special events could occur that would generate additional trips, but if they were to occur, the traffic would be intermittent and not generate a typical trip generation.

The most significant generator of trips on a college campus is typically increases in enrollment. Historically enrollment reached a peak in 2006 and then dropped a low in 2016. 2019 enrollment was almost 25% less than the 2006 enrollment. **Table 3** provides the anticipated enrollment starting with Fall 2019 and moving into the future across the USM footprint.

Table 3: University of Southern Maine Future Enrollment

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
ENROLLMENT FUTURE - FTE	6123	6184	6245	6371	6498	6628	6694	6761	6829	6897
	Increase in Enrollment - FTE 2019-2023				**375**	**Increase in Enrollment - FTE 2023-2028**				**399**
TOTAL STUDENT ENROLLMENT	8429	8513	8598	8770	8946	9124	9215	9308	9401	9495
	Increase in Student Enrollment 2019-2023				**517**	**Increase in Student Enrollment 2023-2028**				**549**

1. FTE - full time equivalenrts

As shown, USM enrollment has been slowly growing in recent years but may have been limited due to a lack of on-campus housing. Recently, demand has been high for on-campus housing at the Gorham campus, resulting in 210 students being housed in triples (rooms with two other students). This indicates that there is already demand for 210 additional beds. In addition, based on surveys, the University has identified that 296

3 ITE Trip Generation Manual, 10th Edition.

additional undergraduate students and 106 existing graduate students currently are living off-campus that would like to be in on-campus housing. It is also likely that a number of students have opted to attend other Universities that could accommodate them in on-campus housing (in less than a triple room).

Regardless, the traffic count data was collected during the 2019-2020 season when enrollment was 6,123 full time equivalents. By 2023, when the proposed projects are anticipated to open, enrollment is expected to increase by 375 full time equivalents or 517 total students. By fall 2028, a five year horizon after the projects open, enrollment will increase by another 399 full time equivalents or 549 total students or a total enrollment increase of 1066 students.

The ITE trip generation was calculated for the weekday AM and PM peak hours of the generator using the Land Use Code (LUC) for University/College (LUC 550). No adjustments were made to the data in **Table 4** to account for trips made by other modes. Backup information is provided in Attachment 7D.

Table 4: Trip Generation

		Trip Generation - Proposed Site[1]
Weekday AM Peak Hour	Enter	125
	Exit	35
	Total	160
Weekday PM Peak Hour	Enter	51
	Exit	109
	Total	160

1. Trip Generation based on ITE 10th Edition, LUC 550, University/College (1,066 Students).

Trip Distribution

The distribution of the site related traffic was based on USM Portland student zip code information assuming the University will continue to draw from similar geographic areas.

Most site trips are anticipated to be generated to and from the south on Forest Avenue with 46 percent of traffic oriented to and from I-295 and an additional seven percent oriented to and from downtown Portland and parts of South Portland. The next sources of trips are 30 percent to and from Brighton Avenue and 14 percent to and from points north via Forest Avenue. Minor percentages access USM from Preble Street, Deering Avenue points south, and Oakdale Street.

Project Related Traffic Volumes

The trip generation of the proposed site is illustrated in **Figure 5**. The trip generation of the proposed site was added to the future traffic volumes to determine the 2023 and 2028 Build traffic volumes as shown in **Figure 6** and **Figure 7**.

Figure 5: Trip Generation for the Proposed Site

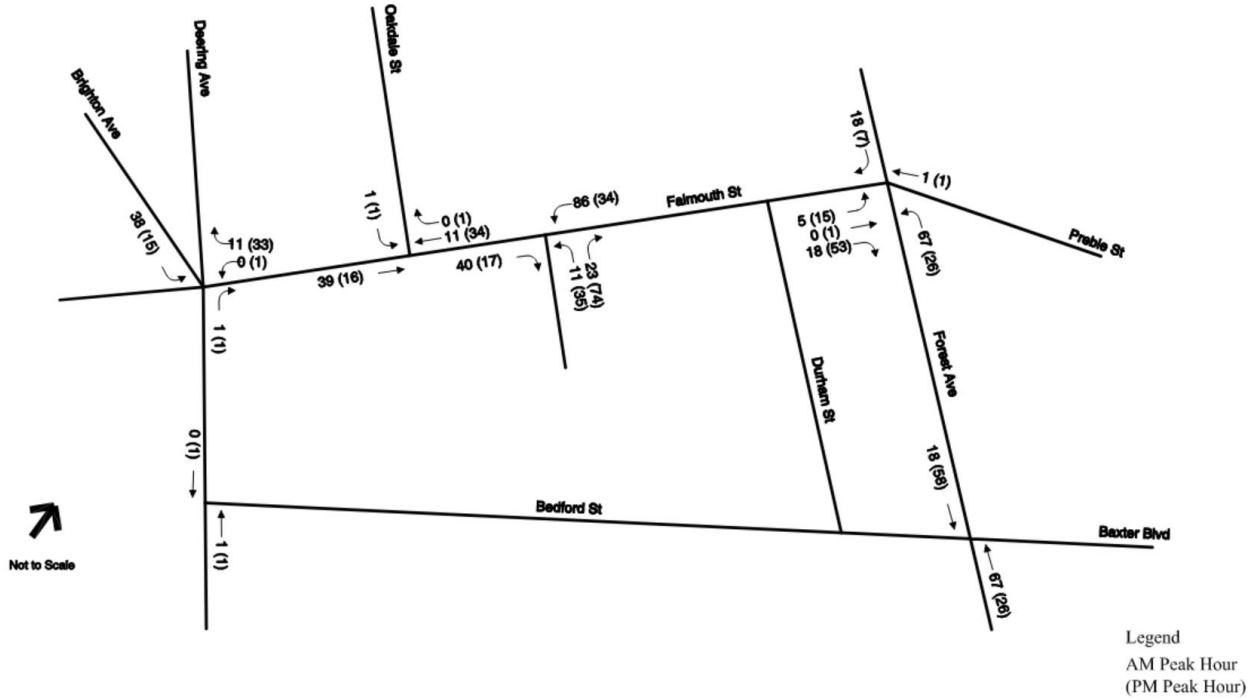


Figure 6: 2023 Build Traffic Volumes

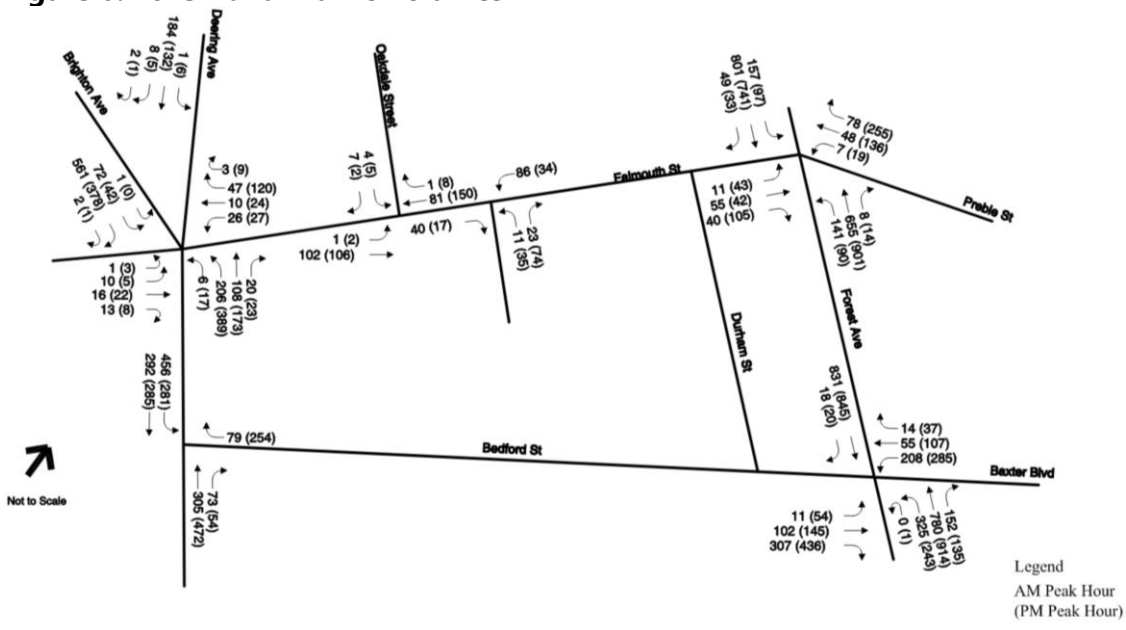
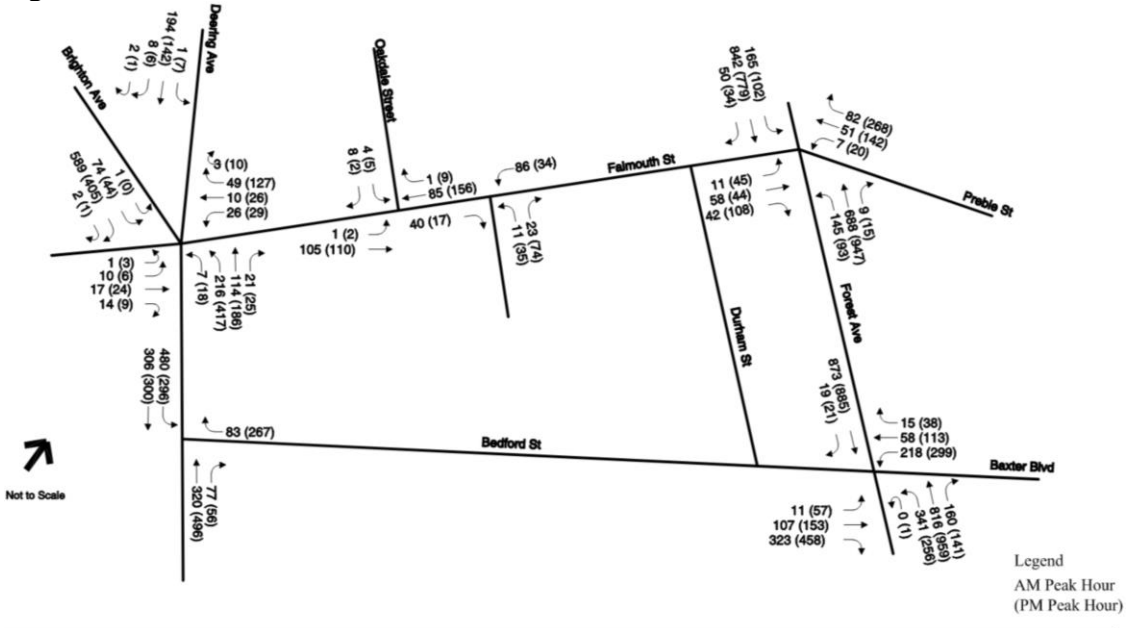


Figure 7: 2028 Build Traffic Volumes



Pedestrian and Bicycle Facilities

With the increased number of residents in the immediate area, it is anticipated that the number of walking and biking trips will increase. Many of these bike trips are likely oriented to and from the cove for recreation. In addition, a number of these pedestrian and bicycle trips will be oriented to and from the retail locations along Forest Avenue. As indicated above, the bicycle accommodations in the study area have improved significantly in recent years with the provision of bicycle lanes and two stage bicycle turn boxes along Forest Avenue. Bicyclists are accommodated in bicycle lanes along Bedford Street and the lower vehicular volumes along Falmouth Street result in a comfortable riding environment on that roadway.

VHB conducted an inventory of the existing pedestrian conditions in the area as shown in **Figure 8**. As shown, there are a number of sidewalk segments that are in poor condition. There are low points in the broken sidewalk that would allow for pooling after a rain event and sections of brick sidewalk on Forest Avenue that are deformed.

Figure 8: Sidewalk Conditions



Pedestrian phases are incorporated into the traffic signal timing at the intersections of both Forest Avenue and Bedford Street and Forest Avenue and Falmouth Street by processing pedestrians concurrently with traffic flow and using lighted signage to indicate to yield to pedestrians. The location of the proposed residence hall would likely result in a desire line to cross Forest Avenue at Bedford Street. The *Portland-South Portland Smart Corridor Plan* included recommendations at Bedford Street and at Falmouth Street. The recommendations included bumping out curbing in order to shorten crossing distances. With shorter crossing distances, the cycle lengths can be lower and still accommodate the required minimums for pedestrian crossing times.

During the scoping meeting, a past pedestrian fatality was mentioned at Forest Avenue and Fenwick Road. Because the students will be traveling along either Bedford Street or Falmouth Street to reach Falmouth Street, it is unlikely that they would choose to not cross at one of those intersections. The pedestrian that chose to cross midblock was likely traveling to and from midblock destinations. The *Portland-South Portland Smart Corridor Plan* did include a Rectangular Rapid Flashing Beacon at this location, likely to address any desire line in this area.

Transportation Demand Management

Through a separate effort, USM has been developing a Transportation Demand Management (TDM) plan in an effort to reduce both campus wide peak parking demand as well as single occupant vehicle trips impacting area roadways during peak hours. Based on the baseline information collected, USM students and employees are already choosing human powered modes at a high rate (11% of students are walking and biking to campus and 13% of employees are walking or biking to campus). With the initiatives included in the plan, this mode split and the percentage of students and employees using transit and carpooling, are all expected to increase. Additional information is provided in the USM TDM. To be conservative in this analysis, no reduction in automobile trips was taken when calculating project related delay increases.

Traffic Analyses

Intersection Capacity Analyses

Intersection capacity analyses were performed for the study area intersections. Levels of service (LOS) were calculated based on the criteria published in the *2000 Highway Capacity Manual*.[4] Level of service is the term that defines the conditions that may occur on a given roadway or at an intersection when accommodating various traffic volume loads. Levels of service range from A to F with LOS A representing generally free flowing operating conditions and LOS F representing generally congested conditions. **Table 5** summarized LOS and delay for signalized and unsignalized intersections and roundabouts. Synchro 10 was used to determine the LOS at signalized intersections and Sidra Intersection 8 was used to determine the LOS at the proposed roundabout.

The initial Existing Conditions Synchro analysis for the Forest Avenue signalized intersections was developed using the analysis performed for the *Portland-South Portland Smart Corridor Plan*. VHB team members were a part of that project and had used field measured queues to calibrate the Synchro analysis

4 Highway Capacity Manual, Federal Highway Administration, Transportation Research Board, 2000.

at that time. No additional calibrations have occurred. Copies of the LOS calculations are provided in the Attachment 7E.

Table 5: LOS and Delay Summary

	Signalized Intersection	Unsignalized Intersection	Roundabout
LOS	**Delay (sec)**		
A	≤ 10	0 - 10	0 - 10
B	> 10 - 20	> 10 - 15	> 10 - 15
C	> 20 - 35	> 15 - 25	> 15 - 25
D	> 35 - 55	> 25 - 35	> 25 - 35
E	> 55 - 80	> 35 - 50	> 35 - 50
F	> 80	> 50	> 50

Table 6 summarizes the operational analysis at the signalized study area intersections during the 2023 and 2028 weekday AM and PM peak hours under No Build and Build conditions, respectively. As shown, the intersection of Forest Avenue at Falmouth Street and Preble Street is expected to operate at LOS B in 2023 and 2028. The operation will continue operating at LOS B under the Build condition with only a two second project related delay increase during both peak hours. A number of movements at this intersection are operating at LOS D and southbound queues do exceed the available storage. The southbound left movement is operating at LOS E under all scenarios. Even the heavy increase of the Forest Avenue northbound left turns onto Falmouth Street in the morning, the vehicle queue can be accommodated in the storage length available for the northbound left turn movement.

The signalized intersection of Forest Avenue at Bedford Street and Baxter Boulevard is expected to operate at LOS D in 2023 and 2028 both without and with the project. Project related delays are expected to be three seconds or less per vehicle. Even in the No Build condition, without project traffic, a number of movements at this intersection are operating at LOS E during the AM peak hour or LOS F during the PM peak hour. Vehicle queues are lengthy for many movements. In fact, the # symbol in the chart indicates that the volumes for 95th percentile cycle exceeds capacity. The installation of adaptive signal control ensures that the intersection operates at optimal conditions throughout the day.

Table 6: 2023 and 2028 Signalized Intersection Operations

Intersection		2023 No Build				2023 Build				2028 No Build				2028 Build			
Peak Hour	**SL^**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**
Forest Avenue at Falmouth Street/Preble Street																	
AM Peak Hour																	
Falmouth Avenue, EBLT	210	0.36	51.2	D	79	0.39	51.8	D	84	0.38	51.4	D	82	0.40	52.0	D	87
Falmouth Avenue, EBR	150	0.09	0.6	A	0	0.17	1.1	A	0	0.10	0.6	A	0	0.18	1.2	A	0
Preble Street, WBLT	630	0.29	49.2	D	74	0.29	48.8	D	76	0.30	49.3	D	78	0.29	48.9	D	79
Preble Street, WBR	630	0.17	5.0	A	27	0.17	5.0	A	27	0.17	4.9	A	28	0.17	4.8	A	28
Forest Avenue, NBL	200	0.35	35.7	D	108	0.56	39.1	D	179	0.36	35.2	D	114	0.57	39.8	D	190
Forest Avenue, NBT/TR	700	0.34	7.4	A	57	0.34	7.2	A	188	0.36	7.5	A	108	0.36	8.0	A	292
Forest Avenue, SBL	150	0.68	58.9	E	186	0.68	58.9	E	186	0.69	58.9	E	193	0.69	58.9	E	193
Forest Avenue, SBT/TR	250	0.44	12.4	B	277	0.49	14.9	B	323	0.46	12.8	B	298	0.51	15.5	B	347
Overall		**0.68**	**17.4**	**B**		**0.68**	**19.1**	**B**		**0.69**	**17.7**	**B**		**0.69**	**19.7**	**B**	
PM Peak Hour																	
Falmouth Avenue, EBLT	210	0.46	51.9	D	91	0.71	70.3	E	115	0.51	53.7	D	98	0.74	73.4	E	119
Falmouth Avenue, EBR	150	0.16	0.9	A	0	0.36	9.2	A	31	0.17	0.9	A	0	0.36	9.0	A	31
Preble Street, WBLT	630	0.65	56.5	E	179	0.65	56.5	E	181	0.66	56.8	E	187	0.66	56.6	E	187
Preble Street, WBR	630	0.58	28.4	C	176	0.57	28.4	C	176	0.59	29.0	C	187	0.59	28.8	C	186
Forest Avenue, NBL	200	0.24	24.6	C	m61	0.29	25.3	C	m86	0.25	25.0	C	m62	0.31	25.3	C	m87
Forest Avenue, NBT/TR	700	0.44	4.6	A	45	0.44	4.6	A	44	0.47	4.5	A	42	0.47	4.5	A	41
Forest Avenue, SBL	150	0.52	75.2	E	m123	0.52	75.3	E	m123	0.54	74.8	E	m120	0.54	74.7	E	m119
Forest Avenue, SBT/TR	250	0.38	10.9	B	141	0.41	11.7	B	141	0.40	10.0	A	126	0.43	10.9	B	126
Overall		**0.65**	**18.1**	**B**		**0.71**	**19.4**	**B**		**0.66**	**18.0**	**B**		**0.74**	**19.3**	**B**	
Forest Avenue at Bedford Street/Baxter Blvd																	
AM Peak Hour																	
Bedford Street, EBLT	530	0.43	45.8	D	138	0.42	45.7	D	138	0.43	45.4	D	143	0.43	45.4	D	143
Bedford Street, EBR	375	0.52	19.7	B	203	0.52	19.8	B	203	0.54	20.3	C	220	0.54	20.3	C	220
Baxter Blvd, WBL	140	0.83	72.6	E	#297	0.83	72.6	R	#297	0.86	76.0	E	#318	0.86	76.0	E	#318
Baxter Blvd, WBT	690	0.09	22.6	C	56	0.09	22.6	C	56	0.10	22.3	C	58	0.10	22.3	C	58
Baxter Blvd, WBR	75	0.03	0.1	A	0	0.03	0.1	A	0	0.03	0.1	A	0	0.03	0.1	A	0
Forest Avenue, NBL	1000+	0.84	62.7	E	#412	0.84	62.7	E	#412	0.88	67.2	E	#443	0.88	67.2	E	#443
Forest Avenue, NBT/TR	1000+	0.50	15.8	B	267	0.53	16.6	B	298	0.53	16.8	B	287	0.57	17.6	B	318
Forest Avenue, SBT/TR	700	0.86	44.0	D	#471	0.88	44.5	D	#488	0.93	51.0	D	#512	0.95	52.4	D	#529
Overall		**0.86**	**36.0**	**D**		**0.88**	**36.0**	**D**		**0.93**	**39.3**	**D**		**0.95**	**39.5**	**D**	
PM Peak Hour																	
Bedford Street, EBLT	530	0.66	51.4	D	239	0.66	51.4	D	239	0.69	52.9	D	253	0.69	52.9	D	253
Bedford Street, EBR	375	0.75	31.3	C	388	0.75	31.3	C	388	0.78	33.3	C	421	0.78	33.3	C	421
Baxter Blvd, WBL	140	1.06	114.7	F	#437	1.09	122.4	F	#437	1.14	139.5	F	#466	1.14	139.5	F	#466
Baxter Blvd, WBT	690	0.17	20.4	C	91	0.17	20.6	C	91	0.18	20.6	C	95	0.18	20.6	C	95
Baxter Blvd, WBR	75	0.06	0.9	A	3	0.06	0.9	A	3	0.07	1.0	A	3	0.07	1.0	A	3
Forest Avenue, NBL	1000+	0.90	79.7	E	#366	0.90	79.7	E	#366	0.94	88.3	F	#392	0.94	88.3	F	#392
Forest Avenue, NBT/TR	1000+	0.69	24.0	C	406	0.70	24.2	C	422	0.72	25	C	438	0.74	25.6	C	456
Forest Avenue, SBT/TR	700	0.88	35.4	D	#405	0.93	42.6	D	#493	0.92	40.1	D	#477	0.98	52	D	#534
Overall		**1.06**	**42.2**	**D**		**1.09**	**44.6**	**D**		**1.14**	**47.1**	**D**		**1.14**	**50.1**	**D**	

^ Storage length measured in feet, length of turning lane or distance to adjacent intersection
+ Volume to capacity ratio
* Delay expressed in seconds per vehicles
** Level of Service
Queue measured in feet
95th percentile volume exceeds capacity, queue may be longer
m 95th percentile queue is metered by an upstream signal

Table 7 summarizes the operational analysis at the unsignalized study area intersections during the 2023 and 2028 weekday AM and PM peak hours under No Build and Build conditions, respectively. At the intersection of Deering Street at Bedford Street, , the stop controlled approach, is anticipated to operate at LOS B with less than 12 seconds of delay during the AM peak hour and LOS C with approximately 20 seconds of delay or less during the PM peak hour in 2023 and 2028 No Build conditions. The addition of project related trips has minimal impact. The southbound approach of Deering Street is anticipated to

operate at LOS B with less than 11 seconds of delay under all scenarios due to the high volume of southbound left turns.

At the intersection of Falmouth Street at Oakdale Street, the stop controlled approach is anticipated to operate at LOS B or better with approximately 10 seconds or less of delay under the 2023 and 2028 No Build conditions. The addition of project related trips have minimal impact.

At the intersection of Falmouth Street at the USM Parking Garage Driveway, the stop controlled approach is anticipated to operate at LOS B or better with approximately 10 seconds or less of delay under the 2023 and 2028 Build conditions.

Table 7: 2023 and 2028 Unsignalized Intersection Operations

Intersection		2023 No Build				2023 Build				2028 No Build				2028 Build			
Peak Hour	**SL^**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**
Deering Street at Bedford Street																	
AM Peak Hour																	
Bedford Street, WBR	190	0.127	11.1	B	11	0.127	11.1	B	11	0.137	11.3	B	12	0.137	11.3	B	12
Deering Street, SBLT	300	0.431	10.5	B	55	0.432	10.5	B	56	0.462	10.9	B	62	0.463	10.9	B	63
PM Peak Hour																	
Bedford Street, WBR	190	0.511	18.4	C	72	0.511	18.4	C	72	0.556	20.2	C	84	0.557	20.3	C	84
Deering Street, SBLT	300	0.305	10.2	B	32	0.305	10.2	B	32	0.329	10.5	B	36	0.329	10.5	B	36
Falmouth Street at Oakdale Streeet																	
AM Peak Hour																	
Oakdale Street, SBLR	245	0.012	8.9	A	1	0.013	9.1	A	1	0.013	8.9	A	1	0.015	9.1	A	1
Falmouth Street, EBLT	620	0.001	7.4	A	0	0.001	7.4	A	0	0.001	7.4	A	0	0.001	7.4	A	0
PM Peak Hour																	
Oakdale Street, SBLR	245	0.008	9.6	A	1	0.010	9.9	A	1	0.008	9.6	A	1	0.010	10.0	B	1
Falmouth Street, EBLT	620	0.002	7.5	A	0	0.002	7.6	A	0	0.002	7.5	A	0	0.002	7.6	A	0
Falmouth Street at USM Driveway																	
AM Peak Hour																	
USM Driveway, NBLR	100					0.063	9.7	A	4					0.064	9.7	A	4
Falmouth Street, WBLT	500					0.046	7.6	A	5					0.046	7.6	A	5
PM Peak Hour																	
USM Driveway, NBLR	100					0.141	10.0	B	12					0.145	10.1	B	12
Falmouth Street, WBLT	500					0.018	7.5	A	1					0.025	7.5	A	1

^ Storage length measured in feet, length of turning lane or distance to adjacent intersection
+ Volume to capacity ratio
* Delay expressed in seconds per vehicles
** Level of Service
Queue measured in feet

Table 8 summarizes the operational analysis at the Brighton Avenue, Deering Avenue and Falmouth Street roundabout during the 2023 and 2028 weekday AM and PM peak hours under No Build and Build conditions, respectively. As shown, even with anticipated growth and project related traffic, the proposed infrastructure will result in a LOS A or better condition during the peak hours at the roundabout in 2023 and 2028.

Table 8: 2023 and 2028 Roundabout Levels of Service

Peak Hour		2023 No Build				2023 Build				2028 No Build				2028 Build			
Movement	**SL^**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**	**v/c+**	**Delay***	**LOS****	**Queue**
Falmouth Street at Deering Street and Brighton Avenue																	
AM Peak Hour																	
Deering Ave, SE	200	0.348	4.0	A	5	0.38	4.3	A	6	0.368	4.0	A	6	0.401	4.4	A	6
Falmouth St, NE	290	0.119	5.4	A	1	0.138	5.2	A	2	0.13	5.6	A	1	0.146	5.4	A	2
Deering Ave, NW	420	0.357	4.6	A	4	0.364	4.8	A	4	0.38	4.9	A	5	0.39	5.0	A	5
Brighton Ave, E	165	0.743	7.6	A	21	0.787	9.4	A	26	0.794	9.9	A	26	0.838	12.1	B	33
Falmouth St, SW	625	0.131	10.7	B	2	0.143	11.5	B	2	0.152	11.6	B	2	0.166	12.5	B	2
Overall		**0.743**	**6.2**	**A**		**0.787**	**7.1**	**A**		**0.794**	**7.2**	**A**		**0.838**	**8.4**	**A**	
PM Peak Hour																	
Deering Ave, SE	200	0.593	4.4	A	12	0.612	4.6	A	13	0.643	4.6	A	14	0.663	4.8	A	15
Falmouth St, NE	290	0.322	8.3	A	4	0.402	9.1	A	6	0.378	9.6	A	5	0.467	11.3	B	8
Deering Ave, NW	420	0.354	8.2	A	4	0.371	9.1	A	5	0.41	9.9	A	5	0.431	11.1	B	6
Brighton Ave, E	165	0.499	3.7	A	8	0.517	3.9	A	9	0.548	4.3	A	10	0.566	4.7	A	11
Falmouth St, SW	625	0.084	6.8	A	1	0.086	6.9	A	1	0.099	7.3	A	1	0.101	7.5	A	1
Overall		**0.593**	**5.2**	**A**		**0.612**	**5.6**	**A**		**0.643**	**5.8**	**A**		**0.663**	**6.4**	**A**	

^ Storage length measured in feet, distance to adjacent intersection
+ Volume to capacity ratio
* Delay expressed in seconds per vehicles
** Level of Service
Queue measured in feet

Multi-Way Stop Control Analysis

The intersection of Falmouth Street at Oakdale Street is a concern for the neighborhood. Although there is projected to be good operations and minimal delays, there is concern that with traffic to and from the proposed garage, that traffic and vehicle speeds will increase. The City has asked that USM conduct a multi-way stop control analysis. The Manual of Uniform Traffic Control Devices (MUTCD) guidelines state that the intersection should meet some of the follow requirements:

- Traffic control signals are justified;
- Five or more crashes have been reported in a 12-month and;
- The intersection meets minimum volume thresholds for any 8 hours:
    - 300 vehicles per hour on the major approach and,
    - 200 total vehicles, pedestrians, and bicycles on a minor approach.

The intersection of Falmouth Street at Oakdale Street does not meet the criteria for the installation of multi-way stop control per the MUTCD guidelines. There were no crashes reported at the intersection over the three year period between 2017 and 2019. In addition, the volumes on Falmouth Street and Oakdale Street during the peak hours do not meet the minimum thresholds.

The MUTCD includes additional criteria that may be considered including:

- Need to control left turns conflicts;
- Need to control pedestrian/vehicle conflicts at locations with high pedestrian volumes;
- Locations with limited sight lines and;
- Locations where two residential neighborhood collector streets meet and a multi-way stop would improve operations.

The intersection of Falmouth Street at Oakdale Street does not meet any of the secondary criteria for the installation of multi-way stop control.

Summary and Conclusions

The project consists of a 580 bed residence hall, Career and Student Center, and up to a 500 parking space parking garage. The 580 bed residence hall will be located on the corner of Bedford Street and Durham Street. The new Student Center will be located to the west of the residence hall, set back from Bedford Street. Vehicular access for loading will be provided to the sites via a lot off of Durham Street. Pedestrian access to the dormitory will be via a front entrance on Bedford Street, an entrance on Durham Street and an entrance across from the Student Center. The main entrances to the student center will face the lawn towards Bedford Street with an additional entrance to the rear of the building.

The proposed development program and associated increases in enrollment is anticipated to generate 160 new trips during the AM peak hour and 160 new trips during the PM peak hour. With these trips distributed onto the adjacent roadway network, the signalized intersection of Forest Avenue at Falmouth Street and Preble Street is expected to operate at LOS B with only a two second project related delay increase. The signalized intersection of Forest Avenue at Bedford Street and Baxter Boulevard is anticipated to operate at LOS under all scenarios with an increase in delay of three seconds or less due site traffic. The unsignalized intersections are anticipated to operate at LOS B or better under all scenarios with the exception of Deering Street at Bedford Street which will operate at LOS C or better. The planned roundabout at the intersection of Brighton Avenue, Deering Avenue, and Falmouth Street is expected to operate at LOS A under all scenarios.

Based on the increased pedestrian demand in the area, VHB recommends that the sidewalk crossing improvements identified in the *Portland-South Portland Smart Corridor Plan* be implemented in order to shorten the crossing distances at the intersections of Forest Avenue with Bedford Street and Baxter Boulevard and Forest Avenue with Falmouth Street and Preble Street. The reduction of crossing distances results in the ability to reduce the pedestrian crossing times and results in a more efficient intersection. USM has committed to construct these improvements.

The City of Portland Traffic Engineer has also indicated that the City is investigating modifications to the Forest Avenue signal operations that will allow the traffic signals to operate differently in the off peak periods that will be beneficial to pedestrians as they would not need to wait as long to receive a walk

indication. This modification would improve the pedestrian experience and is recommended as well. USM has committee to providing funds for this improvement up to $10,000 as a part of this project.

University of Southern Maine (USM) Portland Campus

Transportation Demand Management (TDM) Plan

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1

Introduction

This Transportation Demand Management (TDM) plan provides a cohesive strategy for establishing and implementing a successful TDM program for the University of Southern Maine (USM) Portland campus. This plan seeks to enhance multimodal accessibility, ensure the use of non-vehicular modes, and discourage the use of driving through parking management, to achieve and build upon the parking demand reduction goals for the campus.

The TDM Plan expresses a TDM program of strategies and timeframe for when USM intends to implement the various strategies. The strategies aim at promoting walking and bicycling, improving transit service to promote ridership, promoting carpooling, changing time-of-day travel demands to eliminate or reduce vehicle trips, and managing parking demand via changes to USM's pricing and permit policies.

USM Portland

The University of Southern Maine (USM) Portland campus encompasses approximately 30 acres, with 27 buildings comprising 1,190,929 assignable square feet (ASF). Located less than one mile from the heart of downtown Portland, the Portland campus provides excellent access to social, cultural and internship opportunities. Linked to the Gorham campus ten miles to the west and the Portland city center via frequent bus service (METRO's Husky Line),

the Portland campus also has convenient access and visibility from Interstate Highway 295, with Forest Avenue serving as the primary roadway arrival point. A second important arrival point onto the campus is at the intersection of Deering Avenue, Brighton Avenue, and Falmouth Streets, soon to be transformed into a roundabout. Bedford Street bisects the campus providing access to most of the parking lots and garage for the campus.

The campus is in a completely developed urban neighborhood. The adjacent land consists of Interstate Highway 295 on the east, commercial uses on the north (along Forest Avenue), and residential uses on the west and south. The largest adjacent land use is the Oakhurst Dairy distribution center between the campus and Forest Avenue. The adjacent residential areas provide housing for some of USM's students but are generally a set of very solid and cohesive neighborhoods. Currently, no students reside on the Portland campus.

In 2017 and 2018, the University of Southern Maine undertook a process that resulted in a final *Facilities Master Plan* approval by the Board of Trustees in January 2019.[1] The process included information gathering via tours of all three campuses, extensive internal and external stakeholder interviews, and public input. The plan incorporates the visions, goals, facilities assessments, and the campus space needs assessments into a set of campus physical development recommendations. USM is now embarking in implementing specific capital projects identified in the plan.

Commitment to TDM

USM has a history of promoting Transportation Demand Management (TDM) strategies on its campuses. For starters, TDM clearly falls within two guiding principles of the University's Facilities Master Plan through its attempt to increase non-private vehicular transportation and reduce related transportation emissions:

- **Mobility**—the plan supports robust pedestrian, bicycle, shuttle bus, ride share and metropolitan and regional public transit systems that look beyond private vehicular parking to meet the transportation needs of the campus community.
- **Sustainability**—the plan supports all existing sustainability policies of the University.

TDM also indirectly relates to several other guiding principles as a result of potential outcomes from a TDM program:

- **Student Experience**—the process, plan and implementation focuses upon improving the students' academic, co-curricular and living experience on each of the campuses.
- **Public Safety**—the plan and subsequent implementation seeks to provide the safest campus environment possible through physical, programmatic and operational improvements, including those in response to public health threats like Covid-19.
- **Neighbors**—the plan seeks to establish campuses and campus communities that are positive members of the neighborhoods, mitigating negative impact and providing a beautiful and inviting campus landscape for all neighborhood members to enjoy.

[1] For more details, please visit *usm.maine.edu/president/master-plan*.

- **Aesthetics**—the visual quality of the campus facilities is important to creating an environment that meets the mission and goals of the University.

The implementation of TDM measures provides USM with the ability to make access to the campus more enjoyable and safer for affiliates (because of reduced traffic), improved relations with neighbors (because of decreased traffic and parking concerns), and decreased campus space dedicated to parking.

As a result, the University introduced TDM for the first time within its 2017 Sustainability Plan. The sustainability plan set a quantitative goal for sustainability efforts related to transportation and established a baseline of strategies to achieve that goal. Per the sustainability plan, the goal related to transportation was to reduce greenhouse gas emissions from transportation by 20 percent from a Fiscal Year (FY) 2006 baseline. TDM-related strategies suggested by the Sustainability Plan are presented in Chapter 3; one recommendation was to develop a TDM plan.

To further understand how TDM will play a role as the campus continues to transform, USM hired VHB to develop a comprehensive TDM Plan that will allow the University to meet their sustainability goals while responsibly meeting user parking demands (and limiting the additional parking supply requirements). To develop a strategic approach for USM transportation that leverages current realities in developing future outcomes, VHB and USM hosted a series of stakeholder meetings and interviews. These conversations helped inform the proposed strategies presented in this TDM plan.

Development Proposal: Facilities Master Plan Program Elements

Consistent with the USM *Facilities Master Plan* approved January 27, 2019, USM has several development program aspirations that have triggered the need to complete this TDM Plan. In the short-term, in the next three years, the University plans on embarking on building the new campus "heart", consisting of the following capital projects:

- **Career and Student Success Center**—This building will replace the dining and cocurricular activity space currently in the Woodbury Campus Center. In addition, the vision for this building is to provide a common place for programs and functions that support both the academic success and long-term professional success of the USM student. The building is anticipated to be approximately 56,000 square feet.
- **Student Housing**— This approximately 211,000 square-feet building will house upwards of 577 beds to accommodate upper class undergraduate students and graduate students.
- **"Quad"**—A key component of the transformation of the Portland Campus is a second campus open space, located adjacent to the residence halls and the Career and Student Success Center.

To accommodate parking needs for these uses, the master plan proposes increasing parking supply. (Actual proposed parking supply is based on a separate study produced in March of 2020 that shows the University will be short on parking supply at the opening of the new buildings even in a 0% enrollment scenario.)

The development noted above may be followed by the following capital projects, anticipated within five to ten years:

- **Graduate Center for Professional Studies**—A new Graduate Center is anticipated to accommodate and integrate three primary programs: The University of Maine School of Law, a University of Maine MBA Program, and possibly the Muskie School of Public Service. It is anticipated that the new facility will be in the range of approximately 160,000 gross square feet with a footprint of approximately 38,000-45,000 gross square feet.
- **Center for the Arts**—Serving both the needs of USM students and the community, this new 83,818 square foot facility would be a premier arts venue in Portland. Current plans call for a 850-seat theatrical performance hall and a 250-seat recital hall.

2

Mobility Context

Understanding the transportation context that is available for students, faculty, staff, and visitors at USM Portland is important to be able to recommend targeted TDM program elements. This section discusses in detail all the different ways that one can access the USM campus as well as opportunities and challenges related to those options.

Walking and the Pedestrian Environment

USM's Portland campus is located on the edge of the Portland peninsula adjacent to the Oakdale residential neighborhood. Oakdale maintains a grid of streets, a majority with sidewalks, and low-volume, low-speed streets that make it generally comfortable and conducive for walking. The University is also adjacent to Forest Avenue, which offers local retail (including a grocery shop) within a short walk of the University. *Walkscore.com*, a real-estate site that evaluates walkability and transportation when choosing where to live, scores

USM a 78 out of 100 and considers it to be a "Very Walkable" location where most errands can be accomplished on foot. Unfortunately for the University, both built and natural barriers limit accessibility to areas on the south side because of the I-295 highway, to the west and southwest because of a below-grade railroad, and to the northeast because of the Back Cove. Although the University is less than a mile from much of downtown Portland, I-295 adds an additional psychological barrier for walking trips to downtown. Figure 1 shows the walkshed in quarter-mile increments out to a mile from the USM Portland campus.

Figure 1: 1-Mile Walkshed from USM Portland Campus



On campus, there is a robust network of pedestrian paths that connect all campus buildings (Figure 2). There are also information kiosks and wayfinding to assist pedestrians in their orientation around campus.

Figure 2: Portland Campus Map



In summary, walking is easy in and around USM; however, natural or human-made barriers limit accessibility, particularly to downtown Portland. For example, the primary walk route to downtown from campus is on Forest Ave, which is a wide, fast street with large intersections and long wait times. The walking corridor crosses hazardous on and off ramps from 295.

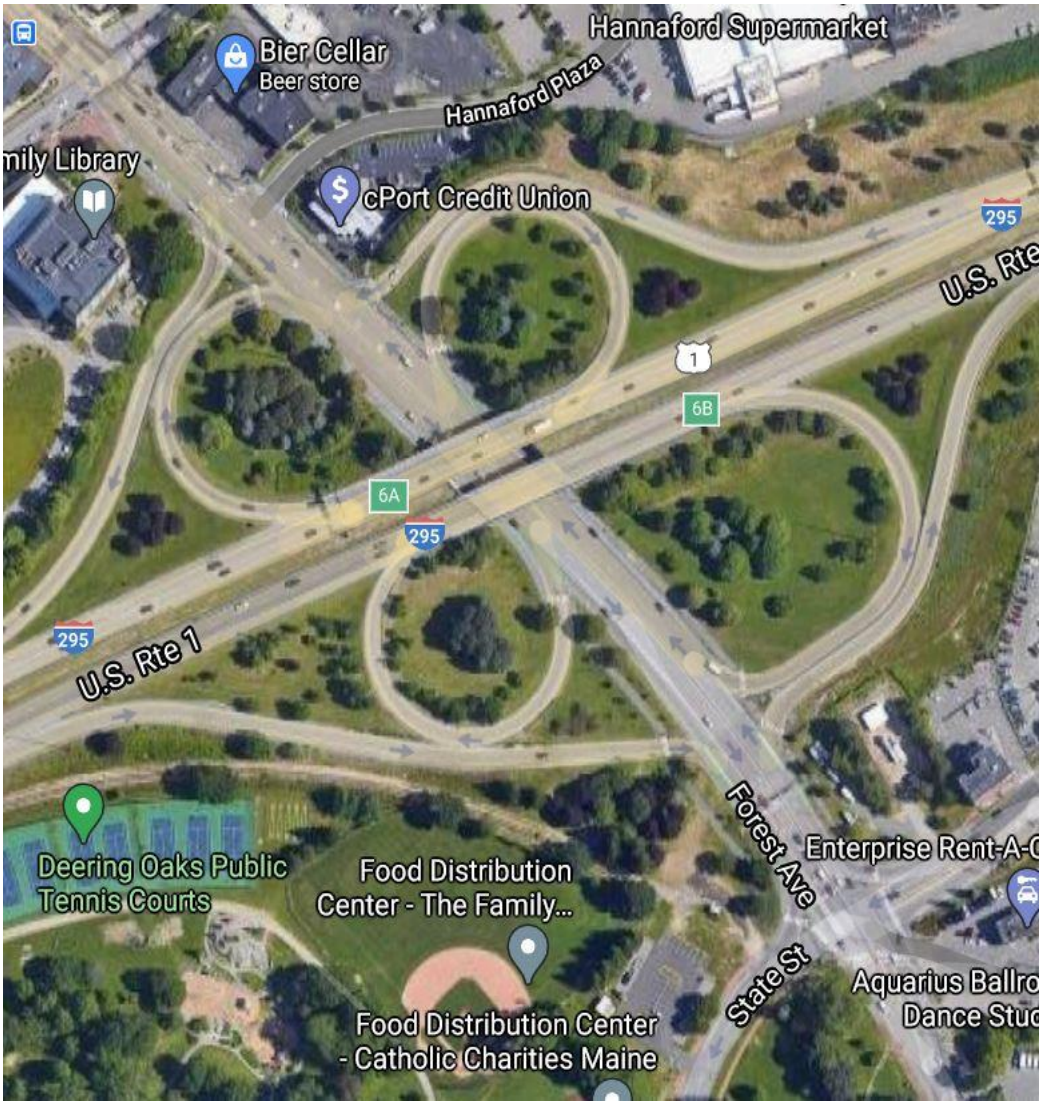
TDM strategies within this plan will seek to better connect the University despite these perceived or real barriers.

Bicycling Environment and Infrastructure

The *Walkscore.com* website lists USM at a Bikescore of 93 out of 100, the equivalent of a "Biker's Paradise." In fact, USM is located at the convergence of several key bike routes in the region that ultimately connect to the Portland Peninsula. Bike lanes around USM can be found along Brighton Avenue, Deering Avenue, Bedford Street, and Forest Avenue.

However, some of the bike lanes navigate treacherous area, most notably the one on Forest Avenue. In less than 1,200 feet, there are six intersections, on ramps, or off ramps on each side of the road. See the aerial image in Figure 3 below:

Figure 3: Forest Avenue Bi-Passing I-295



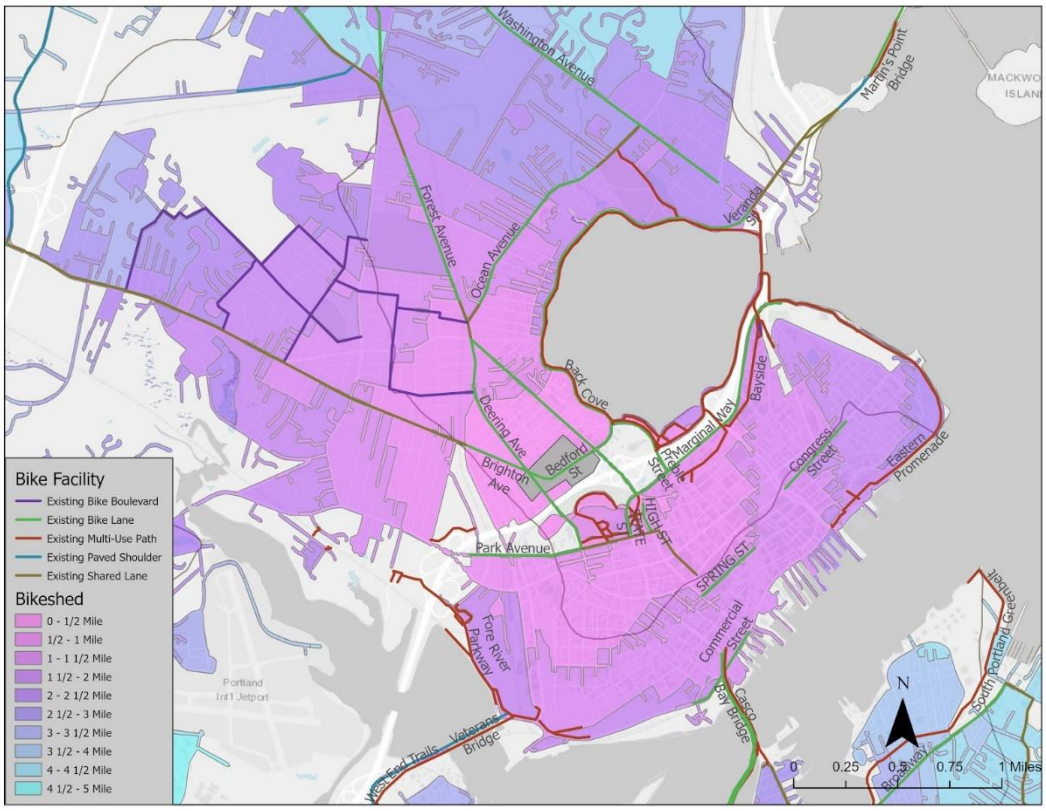
Thankfully, for less confident bicyclists, there is a wide sidewalk that can be utilized.

Figure 4: Crosswalk Available on Forrest Avenue to Cut Across I-295



There is also a multi-use trail that runs parallel along the Back Cove. Although somewhat limited by the aforementioned walking barriers, the entire Portland peninsula can be accessed within 2 miles of USM. Within 5 Miles, one can reach South Portland to the south, Westbrook to the west, and the border of Falmouth to the north. For the bike-to-transit trips, METRO buses serving the University are equipped with bike racks. The Husky line buses have slots for three bikes, and the other METRO buses serving the Portland campus have slots for two.

Figure 5: Bikeshed from USM



On-campus, there are 16 locations with bicycle racks and a bicycle repair stand adjacent to the Woodbury Campus Center. The locations of most of these racks are readily visible within the campus map (Figure 2) posted on kiosks throughout the campus and online. The majority of the racks are easily visible when on foot, except for the covered racks under Masterton's awning and in Abromson parking garage. The condition of the on-campus bicycle racks is fair; however, the Bike Fix-it Station needs repair: its tools have rusted and are bent and unusable. Shower access for campus affiliates is available at the Sullivan Gym. In order to gain access, they must show their campus ID.

In comparison to most places in the United States, the biking network in and around Portland and USM Portland campus is robust. On-campus, commuters have a place to store these bikes. In general, getting people to bike for their commute is difficult and limited to a group of bikers who feel confident to bike on the existing bicycle network. TDM strategies related to biking should focus on marketing this commute option and expanding the potential pool of people that can bike. The University should also collaborate with the City as they seek to expand and improve the bicycle network.

Public Transit

USM affiliates are granted unlimited free METRO transit access as part of their enrollment and employment at USM. Transit access is paid by way of the student transportation fee and

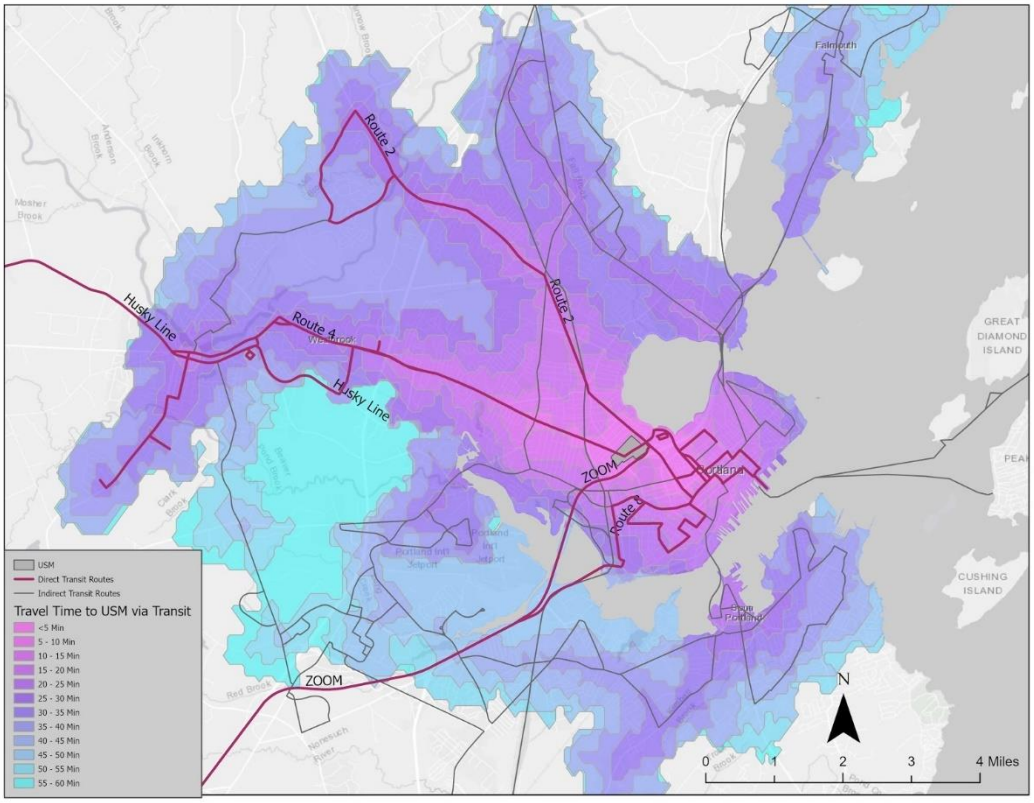
the employee parking permit fee. When boarding a METRO bus, USM affiliates must show their ID to the bus driver.

Four METRO bus routes serve the USM Portland campus: Route 4 and Husky Line serve the campus directly with a stop on Bedford Street, and within a quarter-mile, the Route 2 (via Forest Avenue) and Route 8 (at Hannaford Plaza). In addition to METRO service, the Lakes Region Explorer Bus ($2 one-way) is also nearby. Among the four, only the Husky Line has limited stop service all the way between the Portland and Gorham campuses.

On Bedford Street, at the heart of campus, there are shelters for Route 4 (Westbrook–Portland Pulse) and the Husky Line (USM Gorham via Westbrook–Portland Pulse). Route 2 (Forest Avenue) and Route 8 (Peninsula Loop) can be accessed at nearby Hannaford Plaza roughly a quarter-mile from campus. The Lakes Region Explorer (Windham Route), run by RTP, stops at the corner of Forest Avenue and Bedford Street.

Transit "accessibility" was determined by travel time including walk access (as opposed to walking and biking where distance from campus generally determines accessibility). Expected transit travel time to the campus using the existing Portland transit network was mapped out in 5-minute increments (Figure 6). These increments include up to a maximum of a 15-minute walk for the total trip (to account for walk-access to transit).

Figure 6: Transit Service at USM Portland



Transit is not only a function of having a service route present nearby; other important pieces to consider are its span of service (i.e., is the service available at the times of day when needed) and service frequency (i.e., does the service operate at frequent intervals). Scheduled headways and service hours for direct services are included in Table 1 below.

Table 1: Direct Transit Route Headways

Route	Headways (minutes)							Span					
	Weekday			Saturday		Sunday		Weekday		Saturday		Sunday	
	Peak	Day	Evening	Day	Evening	Day	Evening	Start	End	Start	End	Start	End
Bedford St USM (0.0 Miles)													
Husky	30	30	50	45	45	45	45	6:30 AM	10:30 PM	8:30 AM	11:00 PM	8:00 AM	7:00 PM
4	30	30	60	30	60	45	-	5:30 AM	11:30 PM	6:00 AM	11:30 PM	8:30 AM	7:30 PM
Forest at Bedford St. (<0.25 Miles)													
2	20	30	60	60	60	60	-	6:00 AM	11:00 PM	6:30 AM	10:30 PM	8:30 AM	4:40 PM
Lakes Region Explorer	180	180	180	-	-	-	-	6:00 AM	10:30 PM	-	-	-	-
Hannaford Plaza (<0.25 Miles)													
8	30	30	-	60	-	60	-	7:00 AM	6:00 PM	8:00 AM	6:00 PM	9:00 AM	4:00 PM
?													
Zoom Turnpike Express	30	-	-	-	-	-	-	6:00 AM	6:40 PM	-	-	-	-

While all transit services adjacent to USM operate during the schedule of a normal business day and into the evening, part of the challenge of getting USM affiliates to use these services is the lack of frequency. As one can see above, the most frequent transit service (Route 2) runs every 20 minutes while the Husky Line, Route 4, and Route 8 run on 30-minute intervals. At this frequency it is difficult to capture choice riders even if they had a direct transit route from their home to USM. These services do not offer "transit freedom" or the ability to travel without planning. ("Transit freedom", per the definition by Jarrett Walker in *Human Transit*, is a frequency of at least 15 minutes all day.[2])

Other Mobility

In addition to walking, biking, and riding transit buses, USM affiliates can use ride-hailing services Uber, Lyft, or taxis, which are readily available in and around the peninsula. No carshare vehicles are located within a half-mile of USM. Also, no dedicated carpool parking spaces are designated on campus. Carshare and carpool are opportunities that the TDM Plan can leverage to reduce the number of people parking on campus.

Parking Facilities and Policy

Campus affiliates and visitors can park at 11 distinct parking lots (including one garage) across campus hosting a total of 1,701 spaces (Figure 7). By far, the largest parking facility on campus is the University Garage, which has a total of 1,155 parking spaces. Lots are designated by permit type and only users with that permit can park in that lot. Figure 7 identifies the location of these lots, permitted users, and the total number of spaces. The campus also has dedicated spaces for handicap, service vehicles, and an electric charging station.

[2] Source: humantransit.org/2011/12/how-frequent-is-freedom.html

Figure 7: Parking Spaces at USM Portland



Note: Although the 1,155-space Abromson Garage is primarily for student and visitor parking, faculty and staff may use the facility. The garage is access-controlled by a revenue control system.

All vehicles in University of Southern Maine (USM) parking lots on the Portland campus must display a valid USM parking permit, which comes in the form of a hang tag that must be hung from a vehicle's rear-view mirror. Permits may be obtained from the parking office or online through the University's parking web portal.

USM Portland has the following permit types:

- Student (Commuter, Gorham Residential) – All students are given the same parking privileges on the Portland Campus
- Employee (Faculty, Staff)

On the Portland campus, students may park at three different lots during the day (designated by a green sign) and at a fourth lot only after 4:30 PM. All students pay a transportation fee if registered for on-campus courses. The fee varies based on the number of credits for which they are registered: between $55 and $110 per semester. These payments are mandatory as part of enrollment and are made each semester: fall, spring, and summer.

On the Portland campus, employees are allowed to park in eight different lots on campus (designated by a blue sign). They pay $25 annually for their parking permit, which needs to be renewed each calendar year.

Short-term visitors to the campus may park in the parking garage for $2 an hour between the hours of 7 AM and 5 PM, Monday–Friday. Outside of these hours, visitor parking is free. There is a charge for overnight parking, except during snow bans. Prospective students and their families, campus guests, visitors, and volunteers receive free validation by the office or department they are visiting. To pay for parking, visitors must pay at the Parking Garage Office or use the pay-on-foot stations located by the doors to the parking garage on the first and second floors of Abromson Center and the ground floor of the parking garage by the vehicle exit.

A violation of parking guidelines may result in any number of consequences, including a parking ticket fine, towing of a vehicle (and responsibility of the owner/operator for payment of related towing and storage fees), or suspension of campus parking privileges. Parking tickets range from $25 to $200 depending on the infraction. Students and faculty must pay outstanding tickets before picking up a new permit.

Parking at USM is relatively unconstrained. Typical parking activity is accommodated with the present supply. Although on-street parking is also an option, many of the streets adjacent or near the campus are metered or have 1- or 2-hour parking limits during daytime hours. Recent observations conducted by VHB for USM found approximately one third of the on-street parking spaces available during peak parking periods.

Remote lots have been considered, but a large portion of USM students have one or more off-campus jobs, which require them to have ready access to their vehicles. To be more effective at discouraging parking on-campus, the University plans to make the transactional cost of parking more apparent for students.

The University reviewed parking rates around the City and around the New England market in general to see if there was room to use increased rates as a leverage point. This influenced the University to go from charging $0 for public parking to $2, which is still on the low to medium end of the market. The University is considering raising prices again to possibly $3-$4. However, the current plan is to keep it free for the early evening hours (5-11 pm), and to help out the neighborhood by allowing them to park for free during for snow bans from the hours of 5 pm to 8 am the following morning.

Regional TDM Program

At USM's disposal are several regional, state, and national-level TDM programs and services that are intended to support programs such as the one being reviewed by USM. Among these potential programs/services that could support USM include:

GO MAINE: Run by the Maine Turnpike Authority, this state-wide program serves as a rideshare matching service as well as a platform to log any kind of non-single occupancy trips, including non-motorized trips. The range of services include the following:

- ***Emergency Ride Home***- This program essentially serves as "insurance" to provide people an option to get home from work in case of an emergency. The rides are provided using a taxi or Enterprise rent-a-car. It is available to commuters who carpool, vanpool, take transit, bike or walk at least three days a week. The benefit may be used up to eight times per calendar year.
- ***Way 2 Go Maine***- *Way 2 Go Maine* is an annual commuter challenge in October that encourages employees of local businesses to use alternative transportation options through an inter-company competition. The competition recognizes companies for their successful participation and distributes prizes such as gift cards and swag to encourage participation.
- ***Vanpool Matching***- Vanpooling is a common, long-distance commute option for employees headed to the same general area consisting of between 5 to 15 commuters. GO MAINE assists to form these vanpools.
- ***Rewards Program***- GO MAINE has a rewards program for individuals who take greener trips, which include walking, biking, telecommuting, carpooling, vanpooling, or taking public transportation. Participants must sign-up and log their commutes daily. Rewards include gift cards and discounts to various local businesses.

Portland Slow Ride: To get people comfortable with biking, the Bicycle Coalition of Maine offers the "Portland First Friday Slow Ride". These rides are typically done at a relaxed pace and coincide with Portland's "First Friday" art walk event.

Smart Cycling Traffic Skills 101 and Educational Courses: Traffic Skills 101 is hosted by the Bicycle Coalition of Maine and is a course that teaches new and experienced cyclists how to ride in traffic. An individual or employer can specifically request a safety workshop.

Discounted Helmets: The Bicycle Coalition of Maine runs a helmet purchase discount program: when purchased in bulk (8-30 helmets) the cost is $7 per helmet.

Bicycle Benefit: As part of this national program, local businesses offer rewards to patrons who arrive at their establishments by bicycle.

Cycling Savvy: Is a program of the American Bicycling Education Association aimed at helping communities become more livable and sustainable by promoting a civil and cooperative environment on roads through complementary education and infrastructure design.

Best Employers for Commuters: This membership program provides qualified employers with national recognition and an elite designation for offering outstanding commuter benefits.

TDM at USM

TDM related to increasing multimodal transportation is not a new concept for USM. In 2017, the Office of Sustainability worked with various campus stakeholders to develop an eight-year sustainability plan that set a quantitative goal for sustainability efforts related to transportation and established a baseline of strategies to achieve that goal. Per the

sustainability plan, the goal related to transportation was to reduce greenhouse gas emissions from transportation by 20 percent from a FY 2006 baseline.

Table 2 below identifies the original strategies pursued by the sustainability plan as well as current strategies that came as a result of this original proposal:

Table 2: Suggested TDM Tactics from Sustainability Plan

Category	Original TDM Strategy	Present Day (Fall 2019) Response
Shuttle	Extend shuttle routes and improve shuttle footprint	USM has partnered with the Greater Portland bus system, METRO, allowing students, staff and faculty to ride anywhere in the METRO system for free and vastly expanding the reach of University affiliates.
Carsharing	Explore option of starting a carshare program on campus	USM has explored options with one company and discussed ways it could fit into the vehicle fleet.
Comprehensive TDM Strategy	Create a Comprehensive Transportation Demand Management (TDM) strategy	This document is a product of the development of a comprehensive TDM Plan.
Bicycle Infrastructure	Create adequate bicycle infrastructure & education on campus to support people who would consider biking including a bikeshare program.	To accommodate bicycles, USM provides bicycle racks around the campus (16 racks & 250 spaces total). The Portland campus also has a fix-it work stand which is the first of its kind in Portland and allows riders to make simple bike repairs on campus. The University transportation website also highlights the benefits of biking from a health and environmental perspective.
Carpooling	Create adequate carpooling infrastructure & education on campus to support people who would consider carpooling	USM researched different carpool apps and began interviewing stakeholders to create a plan.
Hybrid & EV Vehicle Discounts	Create modest incentives for hybrid or electric vehicles	An EV charging station is provided at the parking garage and is free to use. Additional charging stations are being considered for the garage, Wishcamper, and locations in Gorham.
Incentive Program	Explore a partnership with Rise-Up to award incentives for alternative transportation commuting	The Office of Sustainability has held brainstorming sessions with the Wellness Committee to determine what types of incentives would qualify for the health credit. The Wellness Committee has agreed to work on implementation.
Carbon On-Setting Project	Explore possibility of creating a carbon on-setting project with local low-income households	No transportation related actions were identified. The Office of Sustainability chose a home weatherization project instead.

Category	Original TDM Strategy	Present Day (Fall 2019) Response
Sustainable Business Travel	Develop mechanism for incentivizing more sustainable business travel	Measured carbon footprint of business travel in order to establish a baseline.
Parking Enforcement	Create a parking enforcement division of the University, separate from Public Safety, in order to maximize space utilization of existing lots	Division was created, staff were hired, and enforcement began.

The responsibilities for implementing these strategies have largely fallen on the Parking and Sustainability Offices. According to USM, approximately 0.1 FTE is spent currently implementing TDM strategies, not counting parking enforcement which exceed 1 FTE by itself

The Plan found that it would be useful to conduct a Transportation Survey of campus affiliates to understand transportation patterns, needs and barriers. USM most recently conducted a transportation survey effort in Spring 2019, yielding over 1,000 responses related to current commute patterns, inter-campus travel, and receptiveness of possible TDM strategies.

Not listed within the Sustainability Plan, but nevertheless worth mentioning as TDM measures that have been pursued by the University include:

- Establishing a new USM transportation website to communicate the availability of alternative modes of transportation.
- Charging USM employees, students, and visitors for parking.
- Having a University System-wide telecommuting policy, which allows for telecommuting in certain cases. In response to the global pandemic, this policy has been broadened to incorporate more people for longer periods of time.
- Having a larger portion of online classes in response to the global pandemic.

3

Existing Transportation Patterns

By exploring how USM students, faculty, and staff are currently traveling to campus we can identify which alternative modes may have the greatest potential to reduce drive alone commutes, and save on trips, parking and carbon emissions. This investigation allows for the development of targeted TDM strategies that offer a greater degree of changing commuter behavior.

VHB has reviewed USM affiliates' travel patterns using two data sources: a transportation survey and registered permit data. These data help identify how people are commuting to campus, what modes of transportation may interest commuters, and finally, what types of strategies would be most beneficial towards encouraging alternative commute modes.

Transportation Survey: Mode Shares and Travel Behavior

The Transportation survey conducted in Spring 2019 was done as part of the University's sustainability effort to chart emissions related to transportation. The online survey asked about current travel patterns between home and USM and about travel between the USM campuses. The survey also included questions about one's receptiveness to certain TDM strategies. About 1,000 USM affiliates participated.

Some key findings related to the survey (pulled from the "Final Survey Summary" prepared by USM) include:

- 78 percent of the USM population reported driving alone at least once a week to campus from home. About 72 percent of the population drives 2+ times per week to campus.
- 94 percent of USM employees park on campus; 81 percent of students park on campus.
- 25 percent of commuter students ride the METRO bus
- Dedicated, preferential carpool spots were the highest ranked activity to encourage students to use an alternative mode of transportation
- Per the survey, a new bike would be the best buyout reward for a parking cashout program, which may be a function of it being the highest value option ($500) compared to less valuable options of $100 cash, $200 discount on carshare/bikeshare, $200 discount on carshare/scootershare, $150 gift certificate to bookstore, and $150 gift certificate to dining services.

Additional conclusions from the survey data for the USM population who indicated making a trip to the Portland Campus include:

- 72 percent of USM Portland population reported having driven alone at least once a week to campus, 66 percent of the population drive 2+ times per week alone.
- 14 percent of the USM Portland population reported have taken transit at least once a week, 11.5 percent have taken transit at least twice per week.
- Considering only USM Portland commute trips (of employees and students), the Portland campus mode split is as follows: Drive Alone: 73 percent; Transit: 6 percent; Walk/Bike: 11 percent; Carpool: 8 percent; Motorcycle: 2 percent[3]
- USM's Walk/Bike mode split of 11% exceeds the typical average of 3% among Universities across the country, including those who have implemented TDM programs, according to VHB
- Average One-Way Commute Distance: 13.8 miles.
- 56 percent of the USM Portland population travels to other campuses
- For trips taken between the Portland and Gorham Campus, 40 percent take transit, 37 percent drive alone, 20 percent carpool, 3 percent bike, 1 percent use a motorcycle

Commute Trip Origins Based on Parking Permit Data

USM provided VHB with anonymized home address data for all their parking permit holders, which allows for an investigation of opportunities for providing incentives for reducing drive-alone trips to the campus. The following figures shows the distribution of commute trip origins based on the permit data. Major clusters of population are centered around the City of Portland, Westbrook, Gorham, Lewiston-Auburn, Brunswick, and Sanford (Figure 8). Figure

[3] It is important to note that this survey was taken before the Covid-19 pandemic. The next survey may show considerably different percentages for transit and carpooling.

9 shows a zoomed-in version of the same data, showing that major residential areas include: Portland, South Portland, Westbrook, Gorham, Biddeford, Scarborough, and Yarmouth.

Using the parking permit data, VHB calculated drive time for faculty and staff. About 50 percent live less than a 20-minute drive from the Portland campus and 94 percent live within a 60-minute drive of the campus.

Figure 8: Distribution of Home (Commute Trip Origins) – Southern Maine Area

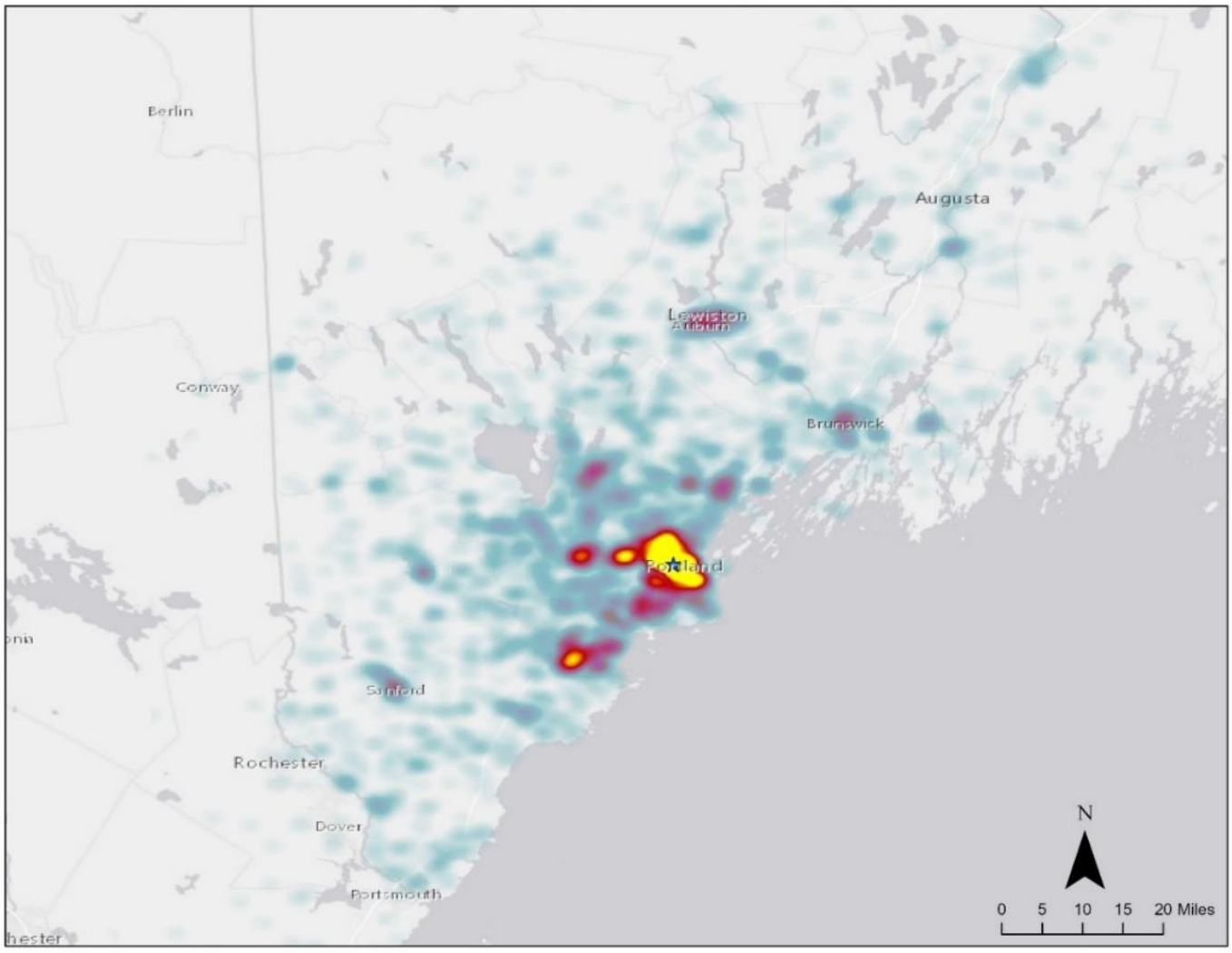
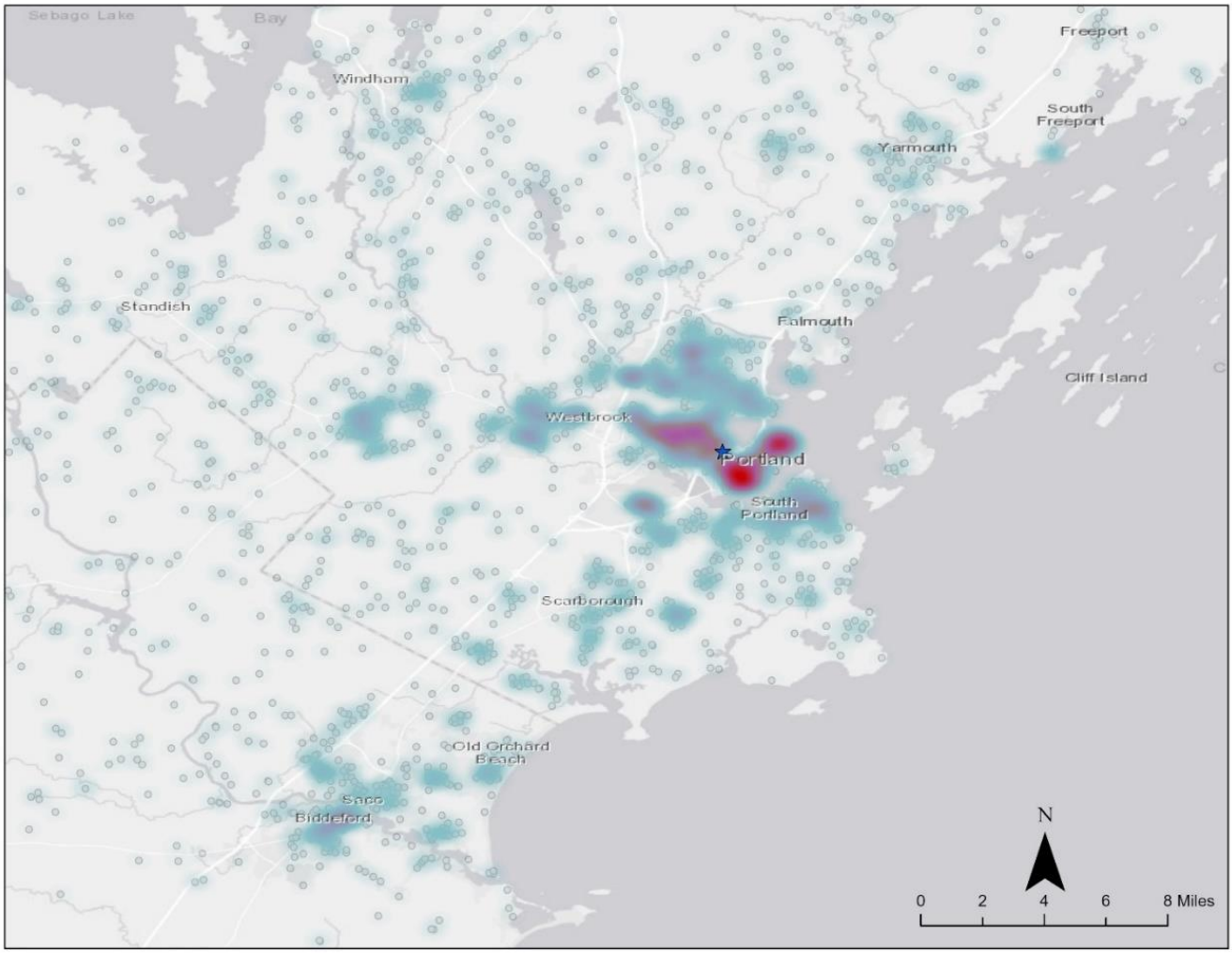


Figure 9: Distribution of Home (Commute Trip Origins) – Greater Portland Area



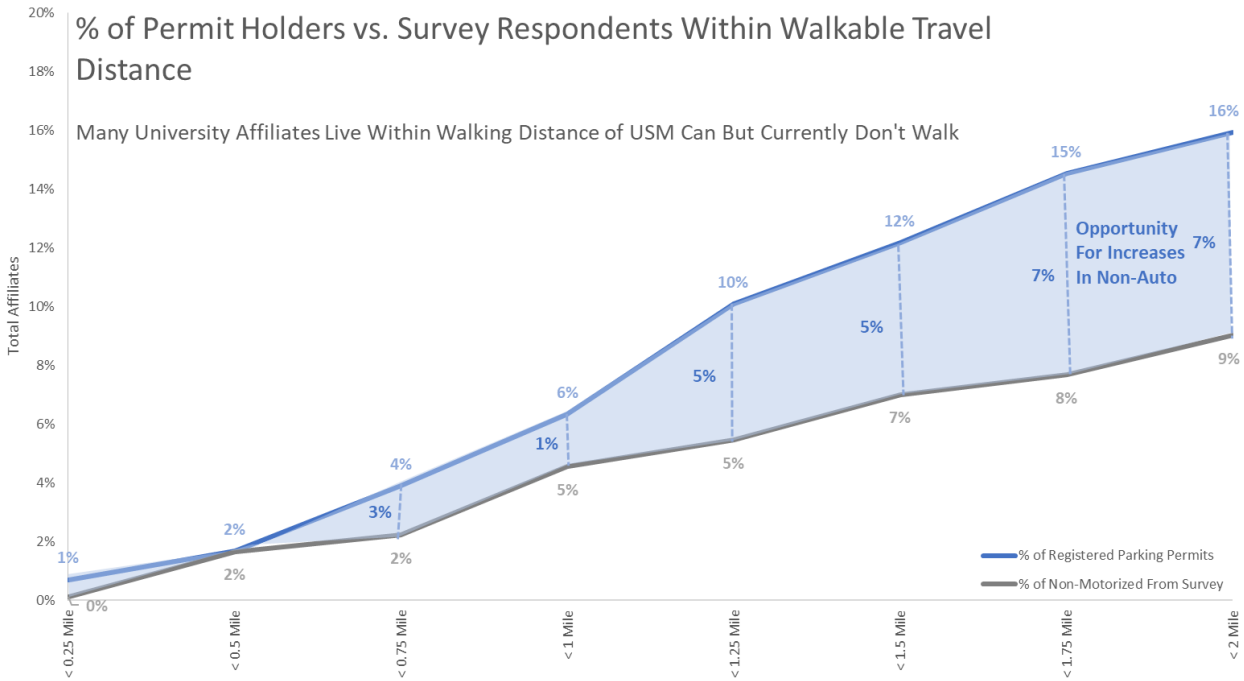
Alternative Mode Potential: Opportunities for TDM

To gauge the modal potential for walking, biking, and transit to USM, the geographic distribution of parking permit trip origin data was compared to the walking, bicycling, and transit travel market sheds. To get an understanding of current travel behavior versus potential travel choices, the 2019 transportation survey results are overlaid against this geographic distribution. The difference between the total number of people matched to a particular mode and the mode choice results from the survey form an "opportunity" zone for a potential increase in the use of a travel mode.

Walk Potential

Within a mile walking distance from campus, approximately 5 percent (an estimated 251 full-time equivalent individuals) of USM Portland students/employees reported using non-auto transportation to the USM Portland campus whereas per the permit data 6 percent of parking permit holders were geographically matched to reside a mile from USM (Figure 10). The delta between the two data points increases significantly as distance from campus increases. At 2 miles, only 9 percent of students/employees use non-auto travel modes (per the survey), whereas a total of 16 percent live within 2 miles of campus (per the permit data).

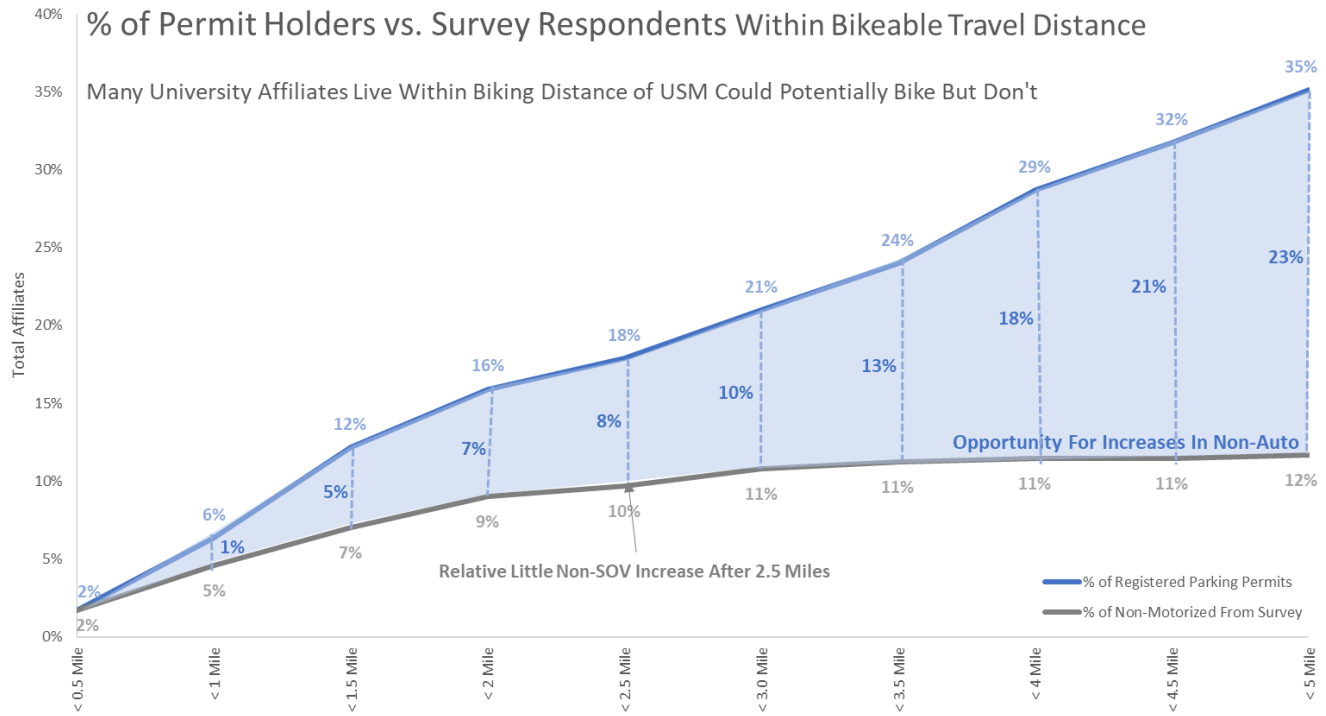
Figure 10: Walk Potential



Bicycling Potential

Biking distance for parking permit holders was compared to non-motorized users based on survey results (Figure 11). Based on the geocoded parking permit data, up to 35 percent of all USM employees and commuter students (an estimated 1,759 full-time equivalent individuals) live within 5 miles of campus, considered the upper limit for a reasonable biking distance for a commute. Per the transportation survey, however, only about 12 percent of commuters who live within 5 miles of campus use a non-motorized form of transportation. According to Figure 11, below, after 2½ miles, most people at USM stop using non-SOV[4] modes of transportation, which may be an indication of the cultural and environmental limits of biking in Maine. Although there is potential beyond 2 ½ miles, that potential should be tempered by barriers of safety, comfort, and weather.

Figure 11: Bike Potential

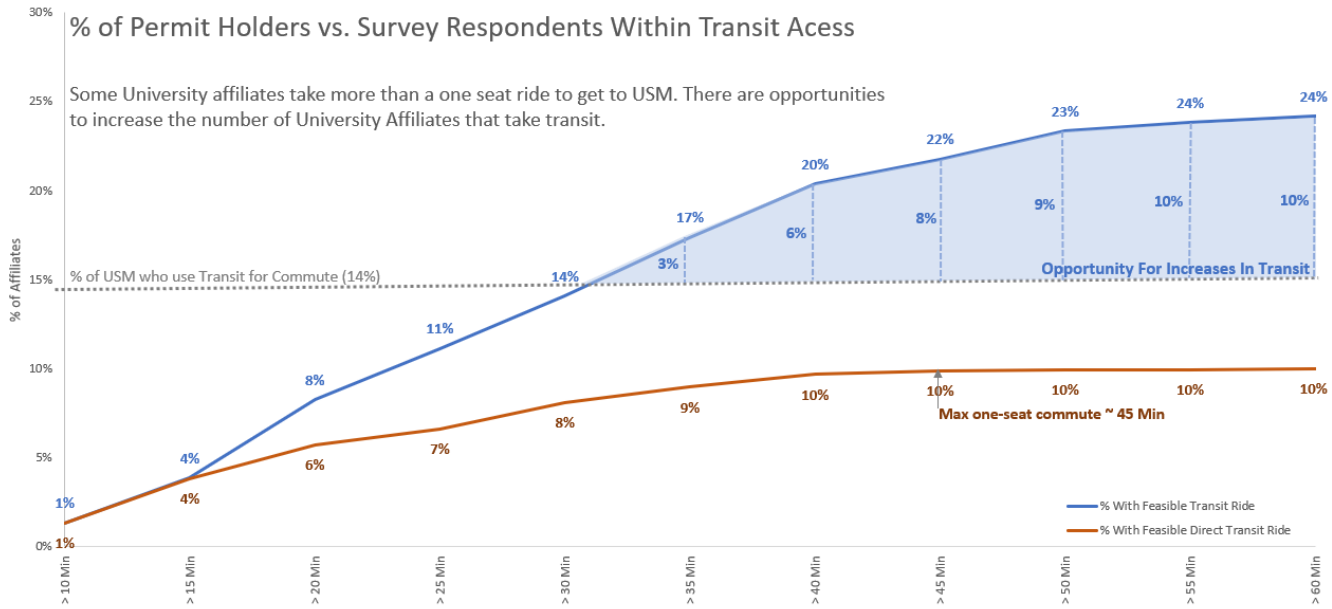


[4] SOV – single-occupancy vehicle (this mode is also referred to as *drive alone*)

Transit Potential

Transit-access time was compared to the percent of commuters from the survey who reported using transit (Figure 12). Up to 10 percent (or 503 FTE individuals) of USM affiliates live within walking distance of a direct transit route to USM Portland (based on the parking permit data). A further 14 percent (summing to 24 percent) can take a transit option that would take less than an hour to access USM Portland. This is 10 percent more than the existing number of University affiliates who indicated taking transit to USM (as reported in the transportation survey).

Figure 12: Transit Potential



Given the higher number of USM affiliates who noted taking transit than the number of affiliates within direct transit routes indicates that either a percentage of affiliates may be connecting on transit service or otherwise driving to a stop first (example driving to Gorham campus and then hopping on the Husky Line). Of all transit routes with direct access to the USM Portland campus, the Husky Line[5] has the highest number of permit holders who live within walking distance (459), followed by Route 4 (451), Route 2 (352), and Route 8 (270). Of all transit routes, the Route 9A and Route 9B serve the most affiliates within walking distance of stops (611), but these routes require a transfer to a transit bus line with direct service to the Portland campus.

[5] This analysis does not account for the fact that the Husky Line is a direct service route with few stops, whereas the other lines are more traditional services; however, the comparison serves to highlight what would be possible if the Husky Line or a route like it where to offer more stops in certain neighborhoods.

4

TDM Coordinator (TC)

TDM program management responsibilities will be designated to a single representative associated with the University.

USM will appoint Aaron Witham, Assistant Director of Facilities Management for Sustainability, as TDM Coordinator for USM; the Director of Auxiliary Services will play a supporting role.

The Assistant Director of Facilities Management for Sustainability can be reached via:

- email at aaron.z.witham@maine.edu
- phone at 207-780-5947.

The responsibilities of the Assistant Director of Facilities Management for Sustainability will include the following:

- Promote non-SOV transportation choices primarily to faculty, staff, students and residents
- Champion the implementation of new TDM strategies to reduce parking demand and increase the use of non-SOV transportation modes
- Conduct new student/new employee orientation to educate incoming affiliates regarding their transportation options to and from the campus.

- Coordinate the implementation of TDM strategies with Campus Scheduling, Human Resources, Parking, and any other departments.
- Work with the City of Portland, METRO, GoMaine, a private carpool app and other potential partners to improve non-SOV transportation access to the campus and to gain support for program implementation.
- Recruit and engage participants for any outreach events or campaigns associated with the TDM program over time.
- Review potential new alternative transportation technology or SOV reduction technology and coordinate implementation efforts associated with them.
- Coordinate all monitoring and evaluation activities necessary to measure the effectiveness of the TDM program in achieving the targets.
- Develop a TDM Report, which will provide an assessment of strategies implemented to date and outline the activities to be implemented in the upcoming year.

The responsibilities of the Director of Auxiliary Services will include the following:

- Provide consultation on TDM strategies that impact parking supply, services, and technology.
- Provide up-to-date data on parking volumes and patterns from the parking garage.
- Provide support for conducting additional parking assessments and measurements annually.
- Co-develop and implement financial parking incentives or disincentives as identified by the TDM plan.
- Maintain existing parking infrastructure and technology, with the support of Facilities Management and Capital Planning.
- Maintain parking services, including payments, campus notifications, and website updates.
- Carry-out parking enforcement.

5

Transportation Demand Reduction Goals

USM expects the TDM program to reduce the number of single-occupancy vehicle trips, thus reducing overall trips, demand for parking and greenhouse gas emissions.

Trip Reduction Goal: USM aims to reduce University-generated peak hour vehicle trips between 3-6% (17-35 trips) by 2025. This goal is relative to a future baseline of 2023, at the opening of Portland Commons, the Career & Student Success Center, and a new parking garage. It is a goal set in relation to the only USM-generated trip data that can be measured accurately: trips entering and exiting the existing Abromson parking garage and the forthcoming new parking garage. The peak hours occur twice a day and are considered to be between 7:30 am- 8:30 am, and also between 4:30-5:30 pm. They are based on total traffic in the area, inclusive, but not limited to USM's contribution. Given that the morning hour is a higher peak overall, this will be the primary focus of the goal.

Parking Demand Reduction Goal: USM aims to reduce parking demand by 10-14% (159-222 vehicles) by 2025 during the hour of peak demand on campus[6]. The peak parking hour and baseline volume was established from 12:30-1:30 pm, Monday- Wednesday, inventoried in the Fall of 2018. As strategies are implemented to achieve this goal, the peak demand

[6] The peak hour for trips is related to the peak hour for parking, but they are not the same. For example, the first peak hour for trips occurs early in the morning when the maximum volume of people are on the road traveling. The peak parking hour occurs later, reflecting cumulative impact as a result of multiple hours of trips coming to campus. This is why the trip reduction goal is smaller than the parking reduction goal.

hour may change, so the goal will stand in reference to the volume, not the time, of parking demand measured at the original baseline peak hour in Fall of 2018.

Greenhouse Gas Reduction Goal: USM aims to reduce greenhouse gas emissions from transportation by 20% (or .48 MT of CO2e per year per capita) by the year 2025. This goal is tied to a larger University pledge called the President's Carbon Commitment, a national commitment among hundreds of college and universities to reach carbon neutrality. USM signed the pledge in 2006, and set 2006 as the baseline with a goal of 2040 for carbon neutrality. Since FY 2007, per capita emissions from the commuting portion of transportation at the University have fallen by an estimated 4.9%, according to the last carbon inventory conducted in 2017[7]. The remaining 15.1% of the commuting sector's relative contribution to the transportation footprint is calculated to be easily surpassed by a combination of the trip and parking goals stated above and the anticipated increase in fuel economy of student, staff, and faculty vehicles. According to the 2020 Transportation Energy Data Book published by Oak Ridge National Laboratory[8], the average required fuel economy of the US fleet is expected to increase by 31.8% between 2019 and 2025. Surpassing this goal will help the University stay on track to hit the overall transportation reduction targets since the other sectors of business travel and study abroad are a little more difficult to reduce by the nature of serving as an increasingly nationally-known University.

[7] The FY 2019 carbon inventory is on track to be completed in December of 2020 and is expected to show that even further reductions have been made over the FY 2006 baseline.

[8] See Table 4.25 of https://tedb.ornl.gov/data/

6

Trip, Parking & GHG Reduction Strategies

The USM Portland TDM Plan establishes an aspirational vision and set of goals for transportation, mobility, and sustainability. The Plan builds off USM's multimodal strengths but pushes forward-thinking and multifaceted solutions.

Ultimately, USM will achieve success if one keeps in mind the following key concepts:

There is no "silver bullet" in TDM. The recommendations represent a package of reforms; implementing only one or two items will not solve USM's parking challenges.

Behavior change is difficult, but critical if USM would like to realize its vision. Future growth at the University will present critical challenges with parking. USM will need to depart from the status quo and rethink parking and transportation in order to grow sustainably.

The Plan is a "living" document. Key to the success of this plan is to implement, measure, learn, and adjust. Over time as the transportation context, technology, institutional culture, and user preferences change, so may the types of strategies that are pursued. This is true now, more than ever, given the current global pandemic, and the need to remain adaptable.

What is presented here is the University's current plan for Transportation Demand Management (TDM). It is subject to change as the global pandemic unfolds, as financial constraints dictate, and as annual survey data and parking counts inform what is working and what is not working among USM's unique population.

Therefore, the University is not committing to launch every one of these initiatives necessarily or committing to keeping every initiative in place permanently if they prove to not be feasible. Rather, the University is aiming to achieve trip, parking, and greenhouse gas emissions reduction targets using the most effective suite of technologies and policies available and achievable for a particular year. That said, it is the desire of the University to launch most of these initiatives in order to provide a multi-modal suite of options to students, staff and faculty, not all of which have the privilege of owning a personal vehicle.

The matrix below introduces a snapshot of the initiatives that USM hopes to implement. Following the matrix is a section outlining descriptions of these initiatives. To the extent possible, strategies are grouped by categories reflected in the *City of Portland's Technical Manual*. For each strategy, an anticipated launch date is provided.

Table 3: Overview of TDM Initiatives for USM

STRATEGY	LAUNCH DATE	INFRASTRUCTURE	INCENTIVES	EDUCATION
Walking				
Create Walk Spot Maps	Fall 2023			X
Publicize the "Complete City Project"	Fall 2021			X
Hold Fitness Challenges	Spring 2022		X	
Biking				
Co-launch City Bikeshare	Spring 2023	X		
Build Bicycle Repair Station	Spring 2023	X		X
Promote Local Bike Activities	Spring 2021		X	X
Offer Discounted Bike Supplies	Spring 2021		X	
Improve Bike Infrastructure	Spring 2023	X		
Apply for Bike Friendly University Certification	Fall 2022	X	X	X
Transit				
Propose Husky Line Improvements	Fall 2022	X		
Propose Transit Service Expansion Beyond Husky Line	Fall 2022	X		
Install Transit Screens	Spring 2023	X		
Carpooling, Telecommuting & Time-of-Day				
Establish Vanpool Vehicles	Fall 2022	X	X	
Designate Carpool/Vanpool Spaces	Fall 2022	X	X	
Develop Rideshare Matching Platform	Fall 2022	X		
Promote Telework & Flexwork	Ongoing		X	X
Restructure Course Schedule	Ongoing	X		

Parking Pricing				
Establish Commuter Parking Buyout Program	Fall 2021		X	
Establish Residential Parking Buyout Program	Spring 2023		X	
Host Carshare Program to Support Buyouts	Spring 2023	X	X	
Unbundle Student Parking Fees	Fall 2021		X	X
Build Additional EV Charging Stations	Fall 2021	X		
Review Parking Price Levels	Fall 2022		X	
Communications & Marketing				
Hold New Student & Employee Orientations for Transportation	Spring 2021		X	X
Revise Transportation Website	Spring 2021			X
Publish Access Guide	Spring 2021			X
Offer Guaranteed Ride Home Service	Spring 2023		X	

Walking Initiatives

Create Walk Spot Maps: Partner with a class and utilize GIS resources to create a semester-long project to build out exciting walking maps that would be made available both online and in print, in high profile locations on campus. The maps would include walkable points of interest, such as bus stops, public restrooms, cafes, breweries, scenic areas, and parks. The online version could be a user interface where you can select your points of interest and create a preferred route around the city. The online version should also include a forum, or a place for individuals to leave comments so they may spread information about the safest and most scenic routes, and also work to create a community of walkers.

This potential initiative program could also be made into a bi-annual "Walking Challenge" where individuals keep track of the various routes and enter that information into a type of raffle or other contest where they win a gift certificate to a sporting goods or shoe store.

Publicize "The Complete City" project: Participate in this project through a class or creation of a stakeholder group. The project is being run by the Portland Society for Architecture. They are reaching out to the Greater Portland community to make the area more accessible, more attractive, more just and equitable. This includes creating what they (and others) describe as "The Complete City," where within the city, each neighborhood has all it needs within a half mile, incentivizing alternative transportation by intentionally planning communities.

Hold Fitness Challenges: Partner with an existing health app or utilize the USM student app to create a fitness challenge for most steps per week. This will be accessible to most students, as most individuals have a smartphone that would be compatible with such an app.

Each week, the app could send out a public note of congratulations to the walker with the most steps. The app could also create benchmarks where if a member of the community reaches a certain number of steps in a certain number of days, they receive a percent discount code to a local sporting goods store or shoe store.

Biking Initiatives

Co-Launch City Bikeshare: Partner with the City of Portland to co-launch a Bikeshare program that will cover, at a minimum, the USM-Portland campus, the back cove, Oakdale, Brighton, Bayside and Parkside. The University will provide financial support for Bikeshare parking spaces on the Portland campus if necessary.

Build Bicycle Repair Station: Install a new student-run bike repair station or shop (deemed "the Hub") in a central part of their campus. Shop will be located in a corner of the Abromson parking garage, a stand-alone shed or some other covered location, where it can be out of the wind and the rain. The University aims to make it a social hub as well, where information about alternative modes of transportation can be offered. If survey data suggests additional need, then we can build a stand-alone self-service fix-it station near the center of campus.

Promote Local Bicycle Activities: Promote the participation in (and facilitation of) local bike activities such as the Portland Slow Ride, Smart Cycling Traffic Skills 101, and Cycling Savvy events. At least one opportunity or event will take place each semester.

Offer Discounted Bike Supplies: Provide Discount Sales for Bike Supplies (through a partnership with Bicycle Coalition of Maine or another program). Sales will either be ongoing in the bookstore and/or combined with the special events noted above once per semester.

Improve Bicycle Infrastructure: Improve bicycle infrastructure on campus, and propose improvements off campus. The University plans to increase bicycle parking spaces to 2.5 times what is currently offered on the Portland campus. Currently there are 250 spaces with another 10 being planned for the Wishcamper lot remodeling. Forty-one of these spaces are covered.

USM plans to add 122 short-term (uncovered spaces) to campus, with a lot of them slated for the new quod and some of them being distributed throughout campus to fill in gaps. USM also plans to add 288 long-term (covered spaces). Forty of these long-term spaces are proposed for a bike room inside the Portland Commons residence hall, and 248 long-term spaces are proposed for another location somewhere near Portland Commons and the Career & Student Success Center (CSSC). Possible sites include the new parking garage if it is located near the other two new buildings, in a stand-alone shelter, or in a secure area of the Abromson parking garage. In addition to spaces for personal bikes, the current plan is to offer dedicated spaces for the proposed bikeshare bikes.

These volumes of new bike parking meet or exceed several important standards that align with the University's aggressive plan to increase biking among its students, staff and faculty:

- 5.5 times higher than City of Portland's Technical Specs, campus-wide[9]
- Double the amount suggested by APBP for short-term parking for students & employees[10]
- Meets APBP's recommended long-term space allocation per bed[11]
- Exceeds City of Washington D.C.'s requirement by over 50% for long-term spaces per dwelling units in residential apartments[12]
- Double City of Cambridge, MA's requirements for short-term spaces and exceeds their requirements for long-term spaces.[13]

Off campus, the University will collaborate with the City of Portland on identifying improvements to bicycling infrastructure along corridors traveled by USM commuters through the annual transportation survey.

Apply for Bike Friendly University Certification: Apply for Bike Friendly University Certification. The application process, completed every four years, will help the University identify areas for improvement, and inform the types of questions that need to be asked in the annual survey of students, faculty and staff.

Transit Initiatives

Bus ridership has obviously been impacted by the global pandemic by some customers deciding not to ride the bus and by bus capacity being limited to comply with Federal standards. Despite these challenges, VHB believes that transit ridership demand will fully rebound again within a couple of years, so they do not recommend changes to long-term ridership predictions at this point. However, they note that the ability for ridership to be accommodated depends on supply of seats being available, which could possibly be impacted by future policy decisions coming from the Federal government. For the time being, the University is not adjusting expected transit impact for TDM goals set on a 2023 horizon.

Propose Husky Line Improvements: Conduct graduate-level research on how to increase ridership on the METRO using a community-based social marketing model. Then, make a proposal to METRO with goal of increasing the frequency of the Husky Line to 15 minutes to achieve "transit freedom."

[9] Per City of Portland Code of Ordinances, Section 14-526

[10] Per Association of Pedestrian & Bicycle Professionals' Bicycle Parking Guidelines, 2nd Edition, assuming that student & faculty vehicle spaces are a reasonable proxy for individuals on campus at one time

[11] Per Association of Pedestrian & Bicycle Professionals' Bicycle Parking Guidelines, 2nd Edition multi-family housing criteria of .5 spaces per bed

[12] Per Table 1: https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/DDOT%20bike%20parking%20guide_060118_Screen.pdf

[13] Per College or University Student Activity Facilities, page 4: https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/Bicycle_Parking_Guide_20130926_2017PictureEdits.pdf

Propose Transit Service Expansion Beyond Husky Line: Conduct graduate-level research, using GIS and USM student, staff, and zip code data to analyze route potential. Then, make a proposal to METRO for potential local on-demand bus shuttle connecting downtown Portland to campus and/or increasing the frequency on other non-Husky line routes that serve the Portland campus.

Install Transit Screens: Install real-time transit screens at high profile locations on campus. Candidates are the new parking garage and the Career & Student Success Center.

Carpooling, Telecommuting & Time of Day Initiatives

The initiatives below, when taken together, are some of the strongest leverage points the University has and some of the most nimble. They are paired together here so that they can be substituted for one another when responding to the risks created by the pandemic. For example, under non-pandemic circumstances, the telework and class schedule initiatives could constitute 50% of the demand management that this category is capable of, while under a pandemic scenario they may need to constitute 100% of the demand management. The aggregate goal for this collection of initiatives is to get 125 vehicles out of parking lots during the peak parking demand hour.

Establish Vanpool Vehicles: Establish a program to lease vanpool vehicles and initiative vanpools in high commuter corridors. A candidate for the first potential vanpool is a Lewiston-Auburn Campus to Portland Campus trip.

Designate Carpool/Vanpool Spaces: Designate prime parking spaces for carpool or vanpool on the Portland campus, starting with 50.

Develop Rideshare Matching Platform: Develop rideshare matching platform or meet n' greet events to pair potential carpool participants. University will consider using Go Maine if Go Maine can increase safety measures for student ridership. The University has provided Go Maine with feedback on how to improve safety.

Promote Telework & Flexwork: Establish teleworking arrangements with more employees, with options for full or part-time work and off-peak work.

Restructure Course Schedule: Conduct course catalog review with the goal of spreading out courses by day, time, and/or location. A first iteration of this initiative was started this Fall semester, but the effects of it are currently invisible due to the high percentage of classes being taught online due to Covid-19.

Parking Pricing Initiatives

Establish Commuter Parking Buyout Program: Launch a parking buyout program to encourage employee and student commuters to give up their parking pass in exchange for an incentive of upwards of $500 per year. Only individuals who previously purchased a parking pass the semester before may enter the buyout program. Buyouts would be offered on a first come, first serve basis. A max of 50 buyouts would be given out the first year (so

that the University can monitor and increase when/if effectiveness is proven). Ten emergency parking passes will be offered each semester, which gives individuals the right to park on campus if they have extenuating circumstances, such as childcare issues or emergent health challenges. Emergency passes could be printed from an online form that records number used per individual).

Establish Residential Parking Buyout Program: Launch a parking buyout program to encourage students residents on the Portland campus to give up their parking pass in exchange for a cash incentive, value toward a bikeshare subscription, and value toward a carshare subscription (if available). The value of each of the three incentives is proposed to be $20 per month, totaling $60 in value. The first 40 applicants would get secure, covered parking inside Portland Commons. The second 60 applicants could utilize secure, covered parking in the larger covered parking area in the vicinity. A max of 100 buyouts would be given out the first year (so that the University can monitor and increase when/if effectiveness is proven).

Host Carshare Program to Support Buyouts: Establish a carshare program in partnership with the City, that may be utilized as part of the residential student buy-out program (in subsidized form), or by commuter students, staff, faculty and non-USM community members. The University recognizes that the carshare business plan has been challenged by covid due to the financial losses sustained by car rental businesses, so this initiative may not prove reliable. To that end, it is not a critical leverage point within this TDM plan; rather it is supplemental to the buy-out initiative. The hope is that the industry will rebound by 2023.

Unbundle Student Parking Fees: Unbundle student transportation fee from their other tuition-related fees, so that the payment for a parking permit must be made separately through a manual opt-in program. This action which will draw attention to the cost of those applying and serve as a disincentive to some.

Build Additional EV Charging Stations: Install additional electric vehicle charging stations at select locations. Goal will be to ensure there are enough charging stations available to meet the next year's expected demand of staff & faculty driving EV vehicles to campus (as indicated by annual survey), so that spaces to park do not limit potential EV drivers. Stations are likely to be pay-as-you-go.

Review Parking Price Levels: Review of staff member parking to determine if there is a pricing model that will reduce transportation demand. Goal will be to achieve greater parity between employee and student parking pricing.

Communications & Marketing Initiatives

Communications & Marketing: Hold new student & employee orientations for alternative transportation modes, infrastructure, resources and incentives. This initiative may build upon current student and employee orientation programs to maximize participation.

Revise Transportation Website: Build upon current website (launched in May of 2019) by adding new & expanded alternative transportation options and benefits, and performing ongoing maintenance and updates.

Publish Access Guide: Develop a "slick sheet" access guide summarizing ways to travel to campus and nearby destinations.

Offer Guaranteed Ride Home Service: Promote a guaranteed ride home program from Go Maine or a private carpool app to compliment alternative mode use, and provide security to students, staff and faculty.

Potential Greater Portland Initiatives

The University recognizes that it is only one entity within a much larger complex system of transportation within the greater Portland. Toward that end, VHB researched potential improvements that could be considered by the METRO, the City of Portland, and other supporting entities to support USM's TDM plan. VHB also estimated the potential impact these initiatives could have on USM's trip generation and parking goals. The proposed initiatives and their potential impacts are summarized here:

- **Increase frequency of Husky Line to 15 minutes:** Reduction of 39 (2.5%) to 79 (5%) Peak Hour Parking Spaces
- **Increase frequency of METRO Routes 2 & 4 to 15 minutes**: Reduction of 39 (2.5%) to 79 (5%) Peak Hour Parking Spaces
- **Restructure departures and arrivals of all METRO routes serving the Portland campus in order to create 10 minute headways to downtown:** Reduction of 8 (0.5%) to 16 (1%) Peak Hour Parking Spaces, with even greater reductions possible if all routes were routed to serve the same stop on campus
- **Create local on-demand circulator route (shuttle):** Reduction of 56 (3.5%) to 111 (7%) Peak Hour Parking Spaces
- **Improve downtown METRO loop (Route 8) & route it through the USM campus:** Reduction of 43 (2.7%) to 86 (5.4%) Peak Hour Parking Spaces
- **In support of the above initiatives, METRO could begin to plan around USM as an anchor node in their network when the new residence hall comes online**
- **Create a better defined & safer bicycle/pedestrian corridor from USM to downtown:** Reduction too difficult to estimate until the goal is more defined

7

Monitoring and Reporting Plan

Program monitoring and evaluation are important components of any successful TDM Program, because they provide a quantitative benchmark of the program's effectiveness in reducing single occupancy vehicle trips and parking demand. The Transportation Coordinator (TC) can use the information gathered via the monitoring plan to direct the ongoing implementation of the TDM Program, allowing for adjustments and the introduction of new strategies. Furthermore, via regular periodic reports, USM will provide evidence to the City of the applicant's diligence in implementing the program.

There are different methods for collecting the data necessary to monitor a TDM Program, including surveys, program participation documentation, vehicle parking counts, and activity logs. USM's TDM program monitoring will use vehicle parking counts and person surveys in evaluating the effectiveness of the program. Each of these tools is discussed below.

Trip Generation Counts

Trip generation counts refer to estimating the potential contribution of USM students, staff, and faculty to the total volume of vehicles on the roads feeding the Portland campus. The peak trip hours will be used as the boundary for this metric, and the data will originate from recorded vehicles entering and exiting the parking garage structures on campus (as these structures represent the only automated count system the University has at this time. The peak hours will be assumed to be between the hours of 7:30-8:30 am and 4:30-5:30 pm, Monday through Wednesday, in October, unless future analysis shows they should be at a different time.

The Director of Auxiliary Services at USM will provide vehicle count data from the automated garage entry systems to qualified University staff or a third-party contractor to analyze.

Parking Occupancy Counts

Parking counts refer to a visual or automated account of occupied and/or empty parking spaces. These data are used to ensure that the amount of parking supply (spaces) on site is appropriate to meet peak hour parking demand (parked vehicles).

Under the direction of the Transportation Coordinator, the university will collect observations of vehicle parking during a representative (typically busy, classes-in-session) 3-day period in October. The TC will report the peak parking demand for the campus parking for those observed days.

Parking occupancy of the campus's garages will be based on data retrieved for the parking revenue control system, whereas occupancy of the campus's surface parking lots will require manual field observations. Observations of spaces occupied will be made during each hour in a ten-hour period of 8:00 AM to 6:00 PM.

The reporting of parking transactions and garage use should distinguish, to the extent possible, those users who are USM employees, students, and transient/visitors (hourly, public) users.

A parking occupancy rate relative to total supply of parking on campus will be reported.

Commute/Travel Survey

The Transportation Coordinator will administer a survey of both employees and students of USM Portland.

Surveys provide a qualitative understanding of how well TDM (and Parking Management) program elements are working. The survey will also be used to estimate greenhouse gas emissions associated with commuting.

The TC will conduct the surveys in either the spring or fall session (e.g., March or October), depending on available resources and labor relative to the resources and labor required to conduct the trip generation and parking analysis. The survey will be completed during a week without any holidays and when classes are in session.

Survey questions will incorporate the following components, in addition to others:

- Type and frequency of modes of transportation used in a typical week
- Destinations traveled to via particular modes
- Reasons why people are driving alone
- Reasons why people are not driving alone
- Level of enthusiasm for incentives that would encourage drive-alone respondents to use an alternative mode
- Ideas for improvements to transportation system, including ideas for incentives
- Routes traveled by foot or bike & associated improvements desired
- Trip generation during time of day (in order to supplement USM-generated contribution to peak traffic generation)
- Ownership of elective vehicles
- Questions required for Bike Friendly University application
- Questions about health concerns (e.g. Covid-19) with different modes and how that is impacting behavior and expected to impact behavior in the future

Status and Monitoring Report

Each year, after data are conducted, the TC will prepare a report summarizing TDM program status and monitoring results. In addition to reporting the results of the data collection, the report will detail (1) what/when strategies were implemented, (2) an estimate of how many individuals participated in certain programs, (3) the lessons learned regarding the most effective TDM strategies, including barriers to not driving alone from the survey.

The TC will submit the report to the City of Portland's TDM Program Manager (a position currently staffed in the Planning and Transportation Division of the Planning and Urban Development Department). A report should be issued within 3 months following the last of the three data collection activities (e.g., if the survey is done in March, then a report should be issued no later than June of that same year). The TC will meet with the City of Portland Planning Department and discuss suggestions for changes to the TDM Program, and will make adjustments before the start of the Fall semester.

Monitoring Schedule

Monitoring (survey, parking, and traffic data collection) should begin within the year following the opening of the planned residence hall. Monitoring will occur according to the schedule detailed below, until the year 2030, the horizon year of the *Facilities Master Plan*. Updates to the *Sustainability Strategic Plan* may conclude that further monitoring is warranted.

- Annually:
    - Conduct analysis of trip generation (as described above)
    - Conduct parking occupancy observations (as described above)
    - Conduct a travel survey (as described above)
    - Prepare a TDM monitoring report (as described above)

USM CAREER AND STUDENT SUCCESS CENTER AND RESIDENCE HALL

LEVEL III SITE PLAN

Portland, ME

41 Hutchins Drive
Portland, ME 04102
800-426-4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0232656.00
University of Southern Maine
March 2020

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March 5, 2020

James Rather
Development Review Services Manager
City of Portland
389 Congress Street
Portland, ME 04101

Re: University of Southern Maine – 23 Bedford Street
Career and Student Success Center and Residence Hall
Level III Site Plan Application
Site Location of Development Amendment Application

Dear James:

On behalf of the University of Southern Maine, Woodard & Curran is pleased to submit applications for a Level III Site Plan Review and a Site Location of Development (SLOD) Amendment for a new Career and Student Success Center and a new Residence Hall to be located at 23-29 Bedford Street. The project represents a significant implementation of the University's Facilities Master Plan. In addition to the approximately 60,000 SF Student Success Center and the 580-bed Residence Hall (approximately 220,000 SF) the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services; site lighting; and other site amenities.

The Site Plan application has been prepared in accordance with the City of Portland's Chapter 14, Land Use Code of Ordinances and the applicable sections of the City of Portland Design and Technical Manuals. The SLOD Amendment has been prepared in accordance with Maine Department of Environmental Protection Chapter 500 Rules. It is our understanding that the City will be reviewing the SLOD Amendment under its Delegated Review Authority.

The application materials, supporting documents, and design drawings will be uploaded into the ePlan folder when it becomes available for the project. Thank you for coordinating the review of this important project. If you have any questions regarding this application, please feel free to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

cc: Alexander Porteous - University of Southern Maine
Keith Brown - Capstone Development Group
Craig Piper – SMRT Architects

1. APPLICATION CHECKLIST

[Attached separately]

CITY OF PORTLAND
Planning & Urban Development Department

LEVEL II and LEVEL III SITE PLAN
GENERAL DOCUMENT AND DRAWINGS CHECKLIST

* Please upload each document and drawing as a separate PDF file
* Please upload all drawings in a 24 x 36 sheet size
* Please confirm each item by electronically checking the boxes to the left for each document/drawing
* Please fill out and upload separately the zoning assessment table and waiver table

(At the time of application submission, please contact the Department of Public Works regarding E-911 addressing of your project)

GENERAL APPLICATION DOCUMENTS	
Yes ☑ NA ☐	**Project Description** • Cover Letter with detailed project description
Yes ☑ NA ☐	**Completed Checklist – Level II and Level III Site Plan** (this document)
Yes ☑ NA ☐	**Right, Title and Interest** • Deeds, leases, or purchase and sales agreements
Yes ☑ NA ☐	**Evidence of State or Federal Approvals** • Permits or letters of non-jurisdiction, if applicable
Yes ☑ NA ☐	**Zoning Assessment** • Table listing required and proposed uses and dimensional standards Zoning Assessment Table
Yes ☑ NA ☐	**Existing and/or Proposed Easements or Covenants, applicable.** • Evidence of existing easements and any proposed easements
Yes ☑ NA ☐	**Waiver Requests** • Written request for waiver describing request and reason Waiver Table
Yes ☑ NA ☐	**Financial Capability** • Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
Yes ☑ NA ☐	**Technical Capability** • Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN
STANDARDS AND SUBMISSION CHECKLIST

* Please provide assessment of compliance with standards and include supplemental documentation, as applicable
* Please upload each document as a separate PDF file

TRANSPORTATION

Yes	NA	
☑	☐	**Transportation Analysis- Traffic Impact (14-526 (a) 1)** • Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts • Traffic Impact Study (Technical Manual, Section 1) if applicable
☑	☐	**Access and Circulation (14-526 (a) 2 a)** • Access and internal circulation, addressing ADA access • Access and egress impacts on traffic flows • Description and use of drive-up features, if applicable
☑	☐	**Loading and Servicing (14-526 (a) 2 b)** • Loading and servicing needs, route and travel way geometrics for deliveries • Turning templates for delivery vehicles, if applicable
☑	☐	**Sidewalks (14-526 (a) 2 c)** • Sidewalks and condition along street frontages and internal walkways • Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
☑	☐	**Public Transit (14-526 (a) 3), if applicable** • Existing available transit services • Proposed site plan design details, such as easement, pad base, and shelter
☑	☐	**Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c)** • Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements • Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
☑	☐	**Bicycle Parking (14-526 (a) 4 b)** • Address bicycle parking requirements and identify locations on-site • Construction details for bike racks (Technical Manual, Section 1)
☑	☐	**Snow Storage (14-526 (a) 4 d)** • Management plan for snow removal and locate snow storage areas on plan
☑	☐	**Traffic Demand Management (TDM) (14-526 (a) 5), if applicable** • Develop TDM with Trip Reduction Targets and Strategies

ENVIRONMENTAL AND LANDSCAPE FEATURES	
Yes ☐ NA ☑	**Preservation of Significant Natural Features (14-526 (b) 1), if applicable** • Trees, plants, habitats listed on State or Federal list of endangered or threatened • High and moderate value waterfowl and wading habitat • Aquifers on Casco Bay Islands • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental consultants, determinations from applicable state agencies
Yes ☑ NA ☐	**Landscaping and Landscape Preservation (14-526 (b) 2 a)** • Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) • Protection measures of existing vegetation during construction • Protection measures within Shoreland Zone, if applicable
Yes ☑ NA ☐	**Site Landscaping (14-526 (b) 2 b)** • Screening and buffering of service areas and between non-residential and residential uses • Planting plans with plant schedule and sizes (Technical Manual, Section 4)
Yes ☐ NA ☑	**Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable** • Landscaped islands within parking areas (Technical Manual, Section 4)
Yes ☑ NA ☐	**Street Trees (14-526 (b) 2 b iii)** • Existing Heritage or Feature Trees on site and measures to preserve • Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable
ENVIRONMENTAL AND STORMWATER	
Yes ☑ NA ☐	**Water Quality, Stormwater Management and Erosion Control (14-526 (b)3 a)** • Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable • Erosion control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable • Subsurface sanitary sewage disposal and groundwater protection

PUBLIC INFRASTRUCTURE AND SAFETY	
Yes ☑ NA ☐	**Consistency with City Master Plans (14-526 (c) 1)** • Identify consistency with master plans • Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes ☑ NA ☐	**Public Safety and Fire Prevention (14-526 (c))** • Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) • Emergency vehicle access • Address consistency with public safety standards (Technical Manual, Section 3) • Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
Yes ☑ NA ☐	**Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)** • Electrical services, including providing underground services • Identify existing and proposed connections for public utilities and required public utility upgrades • Sewer line connections are required, if there is a main within 200 feet • Proposed solid waste management facilities on-site and management for the site • Written evidence of the ability to serve from utility companies, as applicable
SITE DESIGN	
Yes ☑ NA ☐	**Massing, Ventilations and Wind Impact (14-526 (d) 1)** • Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable • Bulk, location or height impacts on adjoining structures • Identify and locate HVAC equipment and venting away from public spaces and residential properties • Identify screening and manufacturing specifications for noise, if applicable
Yes ☑ NA ☐	**Shadows (14-526 (d) 2), if applicable** • Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes ☑ NA ☐	**Snow and Ice Loading (14-526 (d) 3)** • Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes ☐ NA ☑	**View Corridors (14-526 (d) 4), if applicable** • Protection of designated view corridors (Portland Design Manual, Appen. 1)

Yes	NA	
☐	☑	**Historic Resources (14-526 (d) 5), if applicable** • Identify developments within Historic Districts or affecting Designated Landmarks • Certificate of Appropriateness or other evidence • Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required • Address preservation and documentation of Archaeological Resources
☑	☐	**Exterior Lighting (14-526 (d) 6)** • Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) • Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
☑	☐	**Noise and Vibration (14-526 (d) 7)** • Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
☑	☐	**Signage and Wayfinding (14-526 (d) 8), if applicable** • Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff • Proposed commercial and directional signage on site
☑	☐	**Zone Related Design Standards (14-526 (d) 5)** • Address Historic Preservation Design Review, if applicable • Address any applicable design review standards by zone • Address submission requirements from Design Manual, page 1, addressing neighborhood context • Description of exterior materials, color, finish, and samples
Construction Management Plan		
☑	☐	**Construction Management Plan** • Construction Management Document and Plan

LEVEL II AND LEVEL III SITE PLAN DRAWINGS CHECKLIST

*** Please upload the following drawings with the listed details as separate pdfs**

(ALL drawings must be uploaded in a 24 x 36 sheet size)

RECENT BOUNDARY SURVEY (stamped by Maine Licensed Surveyor)

- [x] Must be in compliance with Technical Manual, Section 13

SITE PLAN(s) (stamped by Maine Licensed Engineer) including:

Existing Conditions

- [x] Approximate location of structures on abutting property
- [x] Topography
- [ ] Locate water courses
- [ ] Delineate wetlands
- [x] Zone lines

Proposed Site Plan

- [x] Ground floor area, and grade elevations for all buildings

Access, Circulation, and Parking

- [x] Streets and intersections adjacent to site, any proposed geometric modifications
- [x] Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines
- [x] Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas
- [x] Location and dimensions of proposed loading areas
- [x] Existing and proposed transit infrastructure with dimensions/ engineering specifications
- [x] Location of vehicle and bicycle parking with dimensions and engineering specifications

Site Considerations

- [x] Identify snow storage areas
- [x] Location of fire hydrants
- [x] Location of solid waste management facilities

UTILITY PLAN including:

- [x] Existing utilities on site and within public streets
- [x] Location, sizing and directional flows of all existing and proposed utilities
- [x] Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site
- [x] Electric utility infrastructure

GRADING AND DRAINAGE PLAN including:

- [x] Existing grades and drainage
- [x] Proposed grades
- [x] Proposed stormwater management meeting Technical Manual (Section 5), standards
- [ ] Location and proposed alteration of a water course
- [ ] Preservation or alteration of wetlands

EROSION CONTROL

- [x] Must be in compliance with Technical Manual, Section 5

LANDSCAPE PLAN including:

- [x] Existing vegetation to be preserved and preservation measures
- [x] Proposed landscaping and buffers
- [x] Planting schedule

RECORDING PLAT, if applicable
☐ If Subdivision, must be in compliance with requirements of Section 14-496 (b)
ARCHITECTURAL PLANS AND RENDERINGS including:
☑ Exterior building elevations, color renderings, illustrations of all sides
☑ Location and dimensions of all existing and proposed HVAC and mechanical equipment, all proposed screening
☑ Provide context drawings, if applicable (Design Manual, page 1)
☑ Floor plans

2. APPLICATION FEES

A check for the required application fee(s) will be provided to the Planning Department. It is our understanding that the application fee includes:

• Level III Site Plan 200,000 to 300,000 SF	$7,000
• Site Location of Development Permit	$3,500
TOTAL:	$8,500

3. PROJECT SUMMARY

On behalf of the University of Southern Maine (USM), Woodard & Curran (W&C) is pleased to submit applications for a Level III Site Plan Review and a Site Location of Development (SLOD) Amendment for a new Career and Student Success Center ("CSSC") and a new Residence Hall to be located at 23-29 Bedford Street. The project represents a significant implementation of the USM Facilities Master Plan. In addition to the approximately 60,000 SF Student Success Center and the 580-bed Residence Hall (approximately 220,000 SF) the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services; site lighting; and other site amenities. The proposed work is shown on the drawings and renderings included with this application and is detailed below.

3.1 Introduction

The proposed CSSC and Residence Hall project is located on the Portland Campus of USM, at approximately the corner of Bedford Street and Durham Street in Portland, Maine (Site). The attached Location Map and Tax Maps show the project location. The project is located within two underlying City Zones. Most of the project is in the R-5 Residential Zone, with a small portion on the eastern side in B-2 Community Business Zone. The entirety of the project is in the USM Overlay Zone. The purpose of the USM Overlay zone is to allow the University to continue and reasonably expand within defined boundaries, and to recognize the unique qualities of a university campus while at the same time protecting the value and integrity of established neighborhoods. This project is in alignment with that purpose. University buildings and structures are subject to the requirements of the underlying zoning districts, except as modified by the USM Overlay Zone.

The site is currently developed with the Facilities Building, the Woodbury Student Center, and several paved parking lots. The proposed project includes redevelopment of the site for a new Career and Student Success Center, Residence Hall, and Campus Quad. The project will also include reconstruction of the sidewalks along the project's frontages, and the addition of street trees and streetlights.

3.2 Project Purpose and Need

The University of Southern Maine comprises three campus locations in central and southern Maine, a region that is viewed nationally as among the most livable and desirable in the country. The three campuses, located in Portland, Gorham, and Lewiston, have different physical features and dynamics, and each offers a variety of educational, cultural, and recreational opportunities to USM students.

In fall 2019, USM enrolled 8,429 students across its three campuses[1]. The growing student body is the most diverse in the state of Maine, and one of the most diverse in New England. USM's student enrollment has grown since 2015, and USM aims to grow to a total of 10,000 students in the near future.

Further details are provided in the table below regarding USM's fall 2019 student enrollment:

[1] Online students are not included in this figure

Table 1. USM's Population by Classification

Classification	Fall 2019 Enrollment
First-year undergraduate students	1,053
Second-year undergraduate students	1,043
Third-year undergraduate students	1,238
Fourth-year undergraduate students	1,887
Graduate and law students	1,754
Non-degree seeking students	1,454
Total	**8,429**

In fall 2019, 25% of USM's undergraduate students resided in residence halls on the Gorham campus. Almost all graduate and law students are accommodated in the off-campus market, with many living in the Portland area. The design capacity of the Gorham campus housing portfolio is 1,180 beds as of fall 2019. The housing portfolio is typically occupied beyond its design capacity, with fall 2019 occupancy at 119% of capacity.

USM has several strategic objectives and guiding principles for the planning, design and development of the new residential and student life community. Specifically, USM's priorities are as follows:

- To provide a safe, high quality and affordable student life environment that supports the overall well-being of its diverse student community
- To create a residential community for upper-division (third- and fourth-year) undergraduate, graduate and law students that is highly proximate to academic resources and support
- To construct a housing development that maintains affordability for students while assuring the financial sustainability of USM
- To design an iconic community that serves as a campus gateway, that is inviting to off-campus visitors while maintaining a safe and secure campus
- To create a development that serves as a catalyst for community development and connection between USM and Portland and elevates the presence of USM in the community
- To create a vibrant, connected student center environment to service both on-campus and off-campus student populations and sharing facilities infrastructure with the residence hall
- To demonstrate fiscal and environmental responsibility by striving for the sustainability goals outlined in USM's Facilities Master Plan[1]

USM completed a student housing market analysis in 2019 with Brailsford & Dunlavey (B&D), Inc. The analysis includes the following key findings[2]:

- The private housing market is very tight and rental rates are above what students can afford to pay. In B&D's student survey, 71% of USM students who live off campus indicated finding and securing housing accommodations to be at least somewhat difficult.

[1] The USM Facilities Master Plan is an internal plan and is not subject to review and approval by the City. Because this proposed project complies with the existing USM Overlay Zone, USM is not seeking an Institutional Overlay Zone at this time. The full Master Plan document can be viewed here: https://usm.maine.edu/president/master-plan.

[2] From "Housing Survey Market Analysis" - Brailsford & Dunlavey – August 2019

- In B&D's survey, 64% of USM students considered affordability to be the primary factor in their current housing decision. According to the survey, 63% of USM students who live off campus live outside of Portland and have an average one-way commute to campus of 28 minutes.
- B&D surveyed 7,083 rental housing units in the Portland market, the majority of which were not student focused units. The average reported rent was $1,296 per month without utilities, whereas 70% of the students who live off campus indicated paying less than $700 per month for housing, excluding utilities. As 58% of these students don't share a bedroom with another person, this further indicates students rely on the market outside the Portland area to find affordable living accommodations that offer the privacy they desire.
- Proximity to campus was also identified as a critical housing preference for upper-division, graduate, and law students. Forty-six percent (46%) of these students selected proximity to campus and on-campus resources as the second greatest factor which contributed to their decision where to live during the 2018-19 academic year. As these students are more likely to have the majority of classes on the Portland campus, this suggests a strong likelihood that students will prioritize any potential new on-campus housing offered on the Portland campus.
- B&D's survey of USM students tested a variety of unit types at varying rental rates. The survey specifically tested unit types at the rental rates that are comparable to the housing market in the City of Portland. B&D's proprietary demand-based programming model focused on the demand from upper-division, graduate and law students most likely to choose on-campus housing. B&D identified approximately 674 beds of demand for housing at the Portland campus for the current academic year (2018-19).
- Based on the demand analysis, B&D found that USM students seek the most affordable housing options while maintaining their privacy. This was demonstrated through students' unit-type preferences, in which they prioritized private (single bedroom) options with the least cost. Thirty-five percent (35%) of the demand for on-campus housing on the Portland campus was for the single bedroom with en-suite bathroom unit (the cheapest available option), and 40% of the demand was for a single bedroom in a two- or four-bedroom apartment.
- It is clear that USM students desire to maintain their privacy while maximizing affordability. Therefore, minimizing the size of residential units and out-of-unit programming space is paramount to ensuring affordability. As a result, residential support spaces must be limited, and alternative methods of fostering a vibrant, community-oriented atmosphere should be explored.

The multi-family housing market in the immediate area is primarily focused on accommodating the residential needs of the general (non-student) population. With no student housing available on its Portland campus, and limited student-friendly off-campus housing options in close proximity, USM needs to increase its capacity to house students and provide an appropriate and affordable residential experience for multiple class years. USM views the provision of dedicated housing on campus as an important mission-driven goal.

USM completed a Facilities Master Plan in January 2019, which was approved by the Board of Trustees for the University of Maine System. The Facilities Master Plan includes a new residence hall and student center on the Portland campus. The projects support USM's goals and objectives with respect to advancing student development, providing needed space for student activities, and strengthening of the USM community of residential and commuter students.

The University has instituted several strategic objectives and guiding principles for the planning, design and development of the new residential and student life community on the Portland Campus. The new Career and Student Success Center and Residence Hall represent significant advancement towards that vision. The following sections and attached plans and renderings describe the proposed project in more detail.

3.3 Existing Conditions

The Existing Conditions Plan, included in the drawings submitted with this application, depicts the existing conditions of the project area, based on a ground-level survey and site observations completed by SurveyWorks, Inc in February 2020. The Site is currently fully developed with buildings and surface parking lots. There are no significant natural features or wetlands due to the intense level of existing development. Topography slopes generally from west to east towards the intersection of Bedford and Durham Streets, from approximate elevation 50' down to 23'.

3.4 Proposed Development

Siting of the Career and Student Success Center and the Residence Hall generally follows the concepts established in the USM Facilities Master Plan (2019). The new 580-bed, approximately 220,000 SF Residence Hall will anchor the project at the corner of Durham and Bedford Streets. The approximately 60,000 SF Career and Student Success Center will be set back at a slight incline from Bedford Street and works in concert with Masterton Hall to the West and the new Residence Hall to the east to establish the edges of a new Campus Quad. In addition to the Career and Student Success Center and the Residence Hall the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services and site lighting; and other site amenities.

3.5 Civil Engineering Approach

General Siting of Buildings

The proposed project will significantly alter approximately 3.6 acres of the Portland campus of the University of Southern Maine. The project area is the easterly corner of the block defined by Falmouth, Durham, and Bedford Streets which presently includes a large public parking lot, the Woodbury Student Center (approx. 21,701 sf), the Facilities Management building (8,950 sf), and associated service areas, parking, and infrastructure. While these functions are important to the campus operation, the siting of these features does not reflect a planned approach that identified a highest and best purpose for this part of the campus. Consistent with the Facilities Master Plan, the existing features are proposed to be replaced with a new Career and Student Success Center and a Residence Hall to more fully provide a campus experience with a higher functioning and aesthetic site layout. This project will remove all features in the project area and essential services, infrastructure, and offices will be relocated on campus prior to commencing demolition.

The project will replace the Woodbury Center with an updated and properly sized student activity center to be known as the Career and Student Success Center. The Career and Student Success Center will be an approximately 60,000 sf building with three stories to accommodate multiple campus uses including dining, bookstore, student activities, formal mass gatherings, and informal collaboration spaces. It has been sited to generally establish a center of the campus population with the intention that students will commonly use its amenities on a daily basis. The building is generally in the center of the block between Bedford and Falmouth Streets, and located amid three primary academic buildings, a physical recreation building, and the other new building, a residence hall. It was sited in the interior of the campus to establish a central connection to these buildings and emphasize that it be accessed by multiple adjacent pedestrian ways. The new Residence Hall will be approximately 220,000 sf and has been sited on the corner of Durham and Bedford Streets to establish a prominent, singular structure that will improve the campus gateway image. The building will be an approximately 31,000 sf footprint in a "C" shape with wings of 5- and 8-stories and provide housing for approximately 580 students in multiple dwelling unit layouts. The building will be set at 10' from the property line on Bedford Street and 4' from the property line on Durham Street to create an urban streetscape consistent with its mass and provide for hardscape and landscaping amenities for pedestrians. The residence hall will provide residential amenities

including informal gathering spaces, laundry, storage, and support spaces. A public main entrance on the ground floor will be located on Bedford Street and provide access to Residential Life offices and services. The other entrances and building areas including an interior courtyard will be secured for residents only. This is the first residence hall on the Portland campus and represents an important improvement in student services and campus experience.

The two buildings have been sited consistent with a Facilities Master Plan and in accordance with the University Overlay District in order to be consistent with existing building massing. The Residence Hall has been sited at the lowest grade on the campus to de-emphasis its eight-story height in addition to massing the eight-story portion of the building away from Bedford Street. The existing Glickman Library with 7 stories is across Bedford Street from the Residence Hall and the two buildings will be complimentary in their size and height. The Student Success Center was sited to be generally the center of campus and will be a similar height or lower than adjacent buildings such as the Science Building and Masterton Hall.

Site Layout (pedestrian and vehicular accesses, service areas)

Pedestrian access has been provided to both buildings through a combination of public and campus pedestrian ways. The existing sidewalk on Bedford Street will be reconstructed and widened to accommodate higher use by resident students. A new sidewalk will be constructed on Durham Street. Existing campus sidewalks will be maintained or improved to support the new buildings. Vehicle access to the Career and Student Success Center will be provided by expanding the existing service area adjacent to the Central Heating building. It will include a formal loading dock area facing Durham Street and this area will also include parking for dining and service vehicles. Student "move-in and move-out" activities are anticipated to be conducted along Durham Street where the existing one-way pattern will accommodate loading/unloading vehicles along the residence hall frontage. The crosswalks on Bedford Street will be unaltered by this project.

The campus is presently connected to City of Portland mass transit and the project will maintain and capitalize on these routes. The bus stop with shelter structures on Bedford Street will be unaltered by this project and allows for convenient access by resident students.

An associated project is anticipated to be a future parking garage to be constructed in the existing parking lot between Sullivan Hall and the Science Building. This garage is intended to replace the parking lost by the demolition for this project and include student resident parking. Garage access would be from Falmouth Street and allow for access through the garage to the parking lot between Luther Bonney and Masterton Halls. This function would allow for the existing access drive along Masterton Hall to be modified to a primary pedestrian way. The Masterton access drive will continue in service throughout the project construction period and the garage project will be addressed under separate submission to the City of Portland.

Site Grading

The new buildings have been sited to generally maintain and complement the existing topography of the project area. The residence hall ground floor has been set at a finish floor elevation that will complement the elevations along Bedford and Durham Streets. The second-floor finish floor elevation of the residence hall matches the ground floor of the Career and Student Success Center and allows for a potential bridge structure between the residence hall 3rd floor and the 2nd floor of the Career and Student Success Center. The grades between the Career and Student Success Center and Bedford Street will be generally flattened to be appropriate for a lawn while maintaining connection with the area in front of Masterton Hall. The service area grading near the Central Heating building will be generally unchanged with a retaining wall extending from the Career and Student Success Center loading dock to allow for an access ramp and maintain sidewalk grades near Sullivan Hall.

Site Utilities

Existing utility services to the demolished buildings will be abandoned and new services established from Durham Street to the Residence Hall and Career and Student Success Center. Utility services from the public right of way will include sanitary sewer, water, gas, and storm drain. Electrical, telecom, and steam service will be provided from internal campus infrastructure.

Other Site Features

The project provides several site improvements to enhance the campus experience for all student populations. The area between the front of the Career and Student Success Center and Bedford Street will be converted from paved parking to a lawn mall with landscaping and park amenities. This area will allow for both formal mass gathering use and informal recreational use and provide an aesthetic connection between campus buildings. The Career and Student Success Center will include a covered front porch for exterior student gathering and the residence hall courtyard will have landscaping and hardscape for resident recreation. Landscaping is provided adjacent to the new buildings and other frontage and accent areas.

A set of project design plans is attached to this application. The set includes site, utility, grading and drainage plans, and details to support the site design.

3.6 Architectural Approach

Architectural design plans have been provided and reflect the design approach described below.

3.6.1 Building Organization

Description of spaces

The programming at the ground floor of the Residence Hall is designed to enhance the gateway to the campus along Bedford Street and augment the boulevard and campus environment the University has been developing with other development projects.

The Bedford Street Ground floor uses include various meeting spaces, a large multipurpose room, a common kitchen, student lounge/living room, and direct access to the inner courtyard. Transparency is to be utilized to create a visual connection from Bedford Street through the ground floor and into the courtyard. The Student lounge/living room with an adjacent common use kitchen is located at the corner to celebrate student life and to create a welcoming gateway into the campus.

The bicycle storage room is also located along Bedford to encourage multimodal means of transportation.

The Durham Street side of the building contains ground floor residences with a planted buffer between the building and sidewalk to create privacy and separation. As the building returns perpendicular to Durham, maintenance and utility spaces have been located to keep them off street frontages and create a direct connection to the service yard.

The Career and Student Success Center is designed to be an open, permeable building inviting students and faculty to engage in ad-hoc collaboration and spontaneous interaction. A central place of gathering, it is envisaged to be a bustling hub at the core of the USM campus. The southern elevation of the student center fronts the new campus quad with a two-story lobby / lounge. There is a university store, café/pub and satellite radio station in the main lobby on level 1. The student dining center is located north of the lobby with a pedestrian connection to a second entrance enhancing campus connectivity. Level 2 contains a multi-purpose room and student career center. Level 3 contains the USM radio station and other administrative and student service spaces.

Heights, Grades

The Residence hall is situated on the corner of Bedford and Durham Streets. The site grading rises up along Bedford and continues to rise as it wraps around the building parallel with the new Quad towards the student center. We have utilized the site grade to allow for the active and social functions to occur on Bedford street, residences along Durham, and all service and maintenance space to occur back within the parcel, most of which is below grade.

The building form compromises two distinct wings: a five-story wing along Bedford and the new Quad, and an eight-story wing along Durham Street that returns into the heart of the campus. The design intent is for the building adjacent to Bedford to be similar in size—or volume— to the Osher Map Library, Muski School, Hannaford Hall, and Masterton Hall. This volume is also intended to be of brick construction and glass to maintain a look and feel consistent with the nearby buildings.

The shorter five-story wing allows more natural light to reach the courtyard and creates a larger amount of south facing windows within the eight-story wing, which help us meet our Passive House goals. In addition to increasing southern exposure, the eight-story wing is intended to align with building heights allowed along the Forest Avenue Corridor. The building components get smaller at the heart of the site before shifting into more residential aesthetic along Falmouth Street.

The Career and Student Success Center is three stories tall with a mechanical penthouse and an array of solar panels on the roof. The grades rise from the southeast corner of the large open porch to the northwest entry. The front of the building sits several steps above the quad which slopes gently southeast toward the Residence Hall.

Entrances and Egresses

The primary public entrance to the Residence Hall is located on Bedford Street in the middle of the building. This is the only access into the building from Bedford Street other than into the bicycle storage room, which has its own entrance but connects through the primary vestibule to gain access to the building. The only other “public” entrance is located between the CSSC and Residence Hall, which allows ADA accessible elevator access to the courtyard. There are doors located at each stairwell on the exterior of the building for emergency egress only. An additional egress point in the eight-story wing facing Sullivan gym can be used only for move-in/move-out days and emergency egress. There will also be access doors to the mechanical and utility spaces that face the service yard. The student center has a main entrance facing the new campus quad and a second ‘front door’ at the northwest corner of the building connecting to the larger campus context and the new proposed parking structure to the North.

The Career and Student Success Center has a large open porch across the entire front which faces the quad. There are several walks that lead up to the porch and the main entrance vestibule sits slightly to the right of center on the porch. There is another entrance at the northwest corner of the building.

3.7 Landscaping Approach

Landscaping for the new Career and Student Success Center and Residence Hall will be consistent with other campus landscaping improvements including landscape treatments associated with the Wishcamper Building. Landscaping will consist of street trees, accent trees, perennials and shrubs and lawn areas. The main landscape feature of the project will be a large open lawn area in front of the CSSC to create a Campus Quad. Landscaping will be provided to augment campus aesthetics, screen discordant uses (service area and residence hall), manage stormwater and provide recreation areas. The CSSC is intended to be a LEED certified building and as such plant species will be selected to be native or adaptive native plants that require minimal maintenance and be appropriate for the Portland climate.

3.7.1 The Public Streetscape

Proposed sidewalk improvements are provided for both the Durham Street and Bedford Street frontages. A new sidewalk within the street R.O.W is proposed on Durham Street where currently one does not exist. A new, detached sidewalk is proposed on Durham Street to create separation for pedestrians from the travel way and reflect the existing detached sidewalk across the street at the Wishcamper Building.

Existing crosswalks on Bedford Street and at the corner of Bedford St. and Durham Street will be maintained and pedestrian circulation to these locations will be reinforced by layout of campus walk connections.

Existing streetlights on Bedford St. and Durham Street will be maintained. Additional site lighting will be provided to provide safe and secure pathways to campus building structures and public ways.

Street trees are proposed along Bedford Street to meet City requirements and reinforce the existing landscape treatments in from of the Wishcamper Building.

The existing Bus stop on Bedford Street will be maintained and pedestrian access from the proposed project will be enhanced by new walk connections.

3.7.2 The Campus Quad

Hardscape within the quad consists of concrete walks of varying width to provide direct connections to crosswalks and building entrances. All walks will be ADA compliant and of sufficient width to accommodate university maintenance operations.

Landscape on the Quad primarily consist of lawn with accent trees along the edges to transition the building massing to pedestrian/human scale and to frame views to the CSSC. The University envisions that the Quad will be a focal point for student activities due to its central location, solar orientation and flexible space. Accent landscaping along the sides of the Quad include shrubs and perennials in areas where grades are steeper or as buffers between pedestrian walks and building bases.

Site walls will be required to achieve the maximum size of the Quad and to achieve ADA accessible routes. The site walls are also intended to become a landscape amenity for seating and impromptu gatherings and as such all walls have been designed to be a maximum of 3' high and most are proposed to be approximately 18-24" high for ease of seating. Materials for walls will be durable and aesthetically appropriate within the campus vernacular.

The Campus Quad has been located at the front of the CSSC . This location acts as the front yard of the Center and will complement the building uses as the main gathering space for the USM Portland Campus. The Quad is intended for impromptu and planned student activities and gatherings.

3.7.3 The Courtyard

The Courtyard within the Residence Hall Building is designed primarily for use by residents. The courtyard will provide more private outdoor use for the residents of the building and act as a backyard for those living on campus.

Primary access to the courtyard is from the more public spaces within the Residence Hall Building with secure restricted access from outside the building. This reinforces the intended more private use of the courtyard by the residents but allows for special events held within the Residence Hall common spaces to break out into the courtyard.

Landscaping within the Courtyard includes hardscape and softscape areas. Hardscapes (walks and patio) allow for year-round use. Softscape (trees, shrubs and lawn) allow for visual aesthetics, delineation of public and private spaces and buffering of Career and Student Success Center units from more public space.

3.7.4 Materials

Selection of trees, shrubs and ground covers will be appropriate for the Portland climate and site microclimates, maintenance capabilities of the University and intention of LEED standards.

Street trees will be appropriate for the Portland climate and site microclimates along with City requirements.

We anticipate working closely with the City Arborist on the final selection of these plant species.

3.8 Permit Summary

As noted above, this project is being submitted for Site Plan Approval from the City of Portland. The project's size and scale qualify it for a Level III Site Plan that will be reviewed and approved by the Planning Board. The project site is under an existing Maine Department of Environmental Protection (DEP) Site Location of Development Act (SLOD), or Site Law Permit, No. L-20438-22-D-A. An amendment to this permit is required, and it is our understanding that the project will be reviewed by the City of Portland under their Delegated Review Authority. A separate SLOD permit amendment application has been provided with this Site Plan Application, and 3 paper copies have also been provided for the City to supply to the Maine DEP.

3.9 Attachments

- Agent Letter
- Location Map
- Tax Map
- Student Housing Analysis by Brailsford & Dunleavy (Uploaded Separately to Eplan)
- Civil, Landscape, & Architecture Design Plans (uploaded to Drawings folder in Eplan)
- Architectural Renderings (uploaded to Drawings folder in Eplan)

Maine's Public Universities
UNIVERSITY OF MAINE SYSTEM

UNIVERSITY OF SOUTHERN MAINE
PORTLAND • GORHAM • LEWISTON • ONLINE

February 27, 2020

To: Local, State, and Federal Review Officials

The University of Southern Maine, a member of the University of Maine System, is preparing plans for the Career and Student Success Center (CSSC) at the University of Southern Maine, Portland, ME. The University has retained Woodard & Curran, Inc. to assist in the preparation of the applications associated with permitting approvals for this project. When necessary, Woodard & Curran, Inc. is authorized as its agent to represent the University in addressing questions on the plans, or applicable applications, for this project.

Sincerely,

John M. Souther,
Executive Director of Facilities Management,
University of Southern Maine for the
University of Maine System

Facilities Management
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(207) 780-4160, TTY (207) 780-5646, FAX (207) 780-4538
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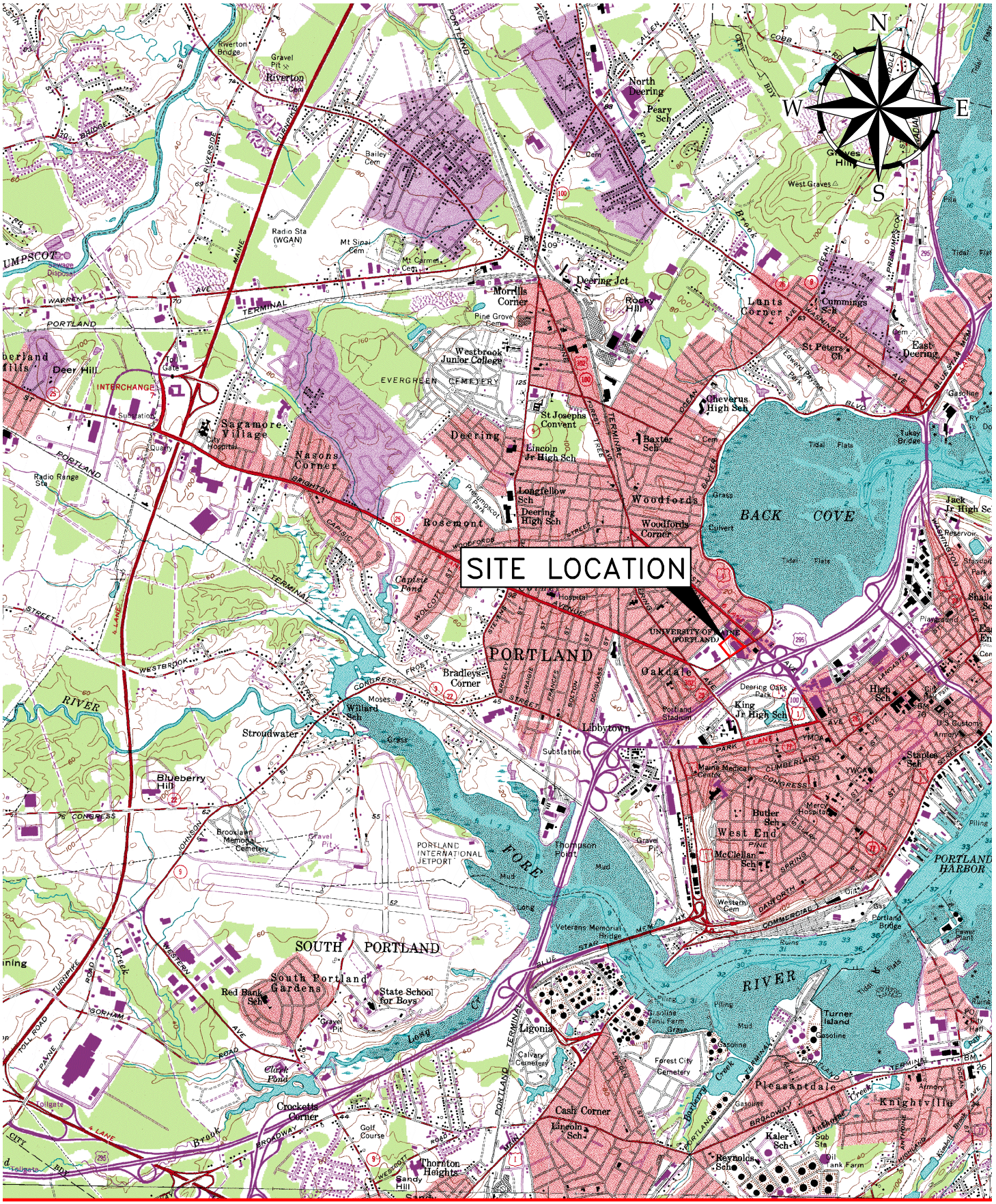
A member of the University of Maine System



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COMMITMENT & INTEGRITY DRIVE RESULTS

LOCATION MAP

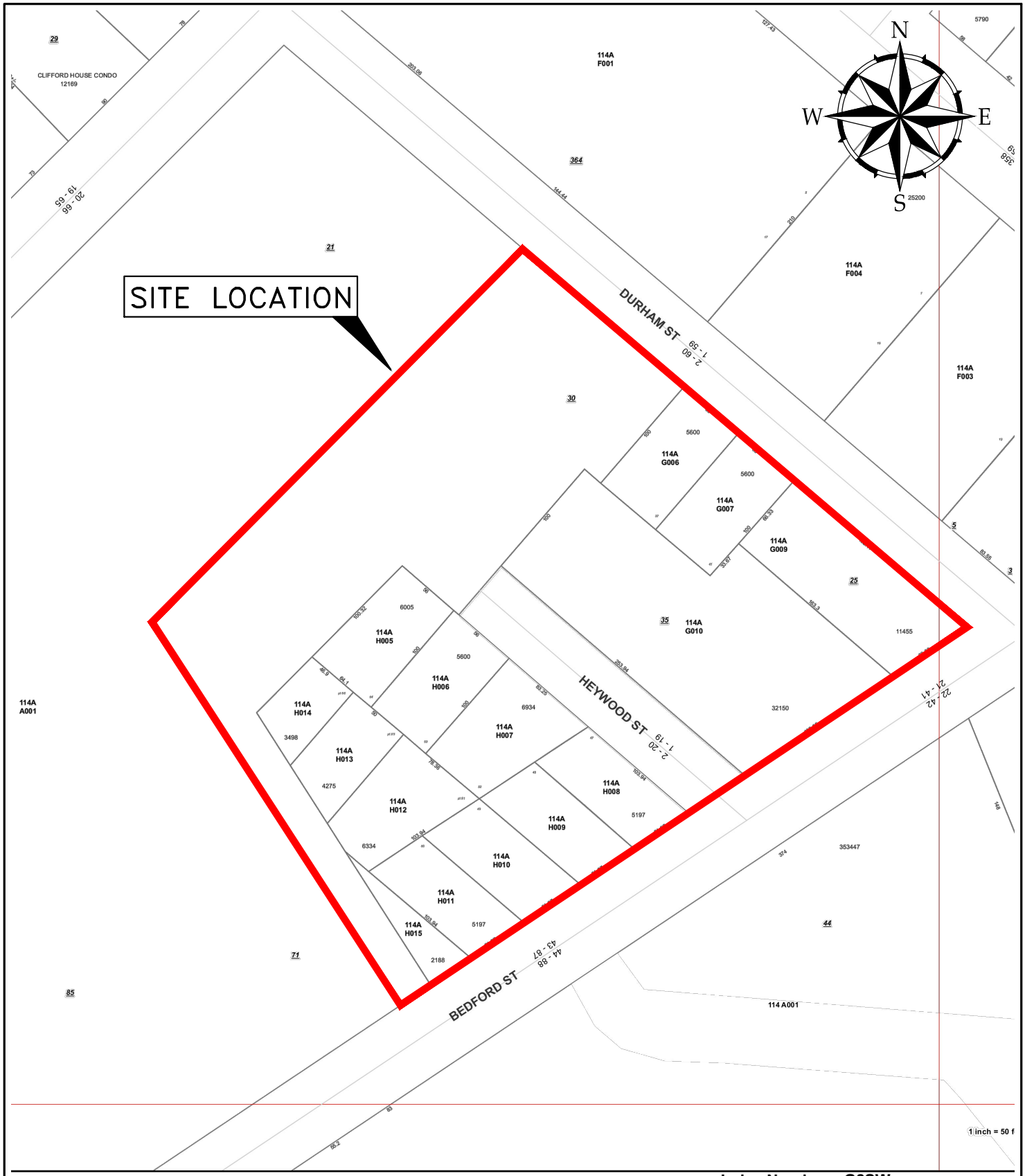
DESIGNED BY: DS	CHECKED BY: DS
DRAWN BY: DS	0232656.00 LOCATION MAP*.dwg

UNIVERSITY OF SOUTHERN MAINE
PO BOX 9300
PORTLAND, ME

CAMPUS STUDENT SUCCESS CENTER
& STUDENT RESIDENTIAL
PORTLAND, MAINE

JOB NO:	0232656.00
DATE:	March 2020
SCALE:	1" = 1000'

Location Map



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TAX MAP

DESIGNED BY: DS	CHECKED BY: DS
DRAWN BY: DS	0232656.00 TAX MAP.dwg

UNIVERSITY OF SOUTHERN MAINE
PO BOX 9300
PORTLAND, ME

CAMPUS STUDENT SUCCESS CENTER
& STUDENT RESIDENTIAL
PORTLAND, MAINE

JOB NO: 0232656.00
DATE: February 2020
SCALE: 1" = 50'

Tax Map

4. WAIVER REQUESTS

At this time, we are requesting only one waiver related to the fiber cement panels. Per the City of Portland Design Manual - (e) University of Southern Maine Overlay Zone, Appendix 3 Standard D-7 "Low Grade Materials" such as fiber cement siding shall not be used on facades visible from the public rights of way. In the intervening years since the design standard was written, the quality of these materials has improved significantly, and they may now be considered long lasting. Fiber cement is currently seen in many high-quality projects throughout Portland.

4.1 Attachments

- City of Portland Waiver Table

Standard to be Waived: Cite Ordinance or Technical Manual Standard	Cite Standard Language: Cite specific language of applicable Ordinance or Technical Manual Standard	Waiver Being Sought: Describe waiver being sought. Ex. – We are requesting a two-way parking lot drive aisle width of 20' feet.	Justification for Waiver: Address specific waiver criteria, if applicable, and document reasons for the waiver request.
City of Portland Design Manual - (e) University of Southern Maine Overlay Zone, Appendix 3 Standard D-7 Materials	Paraphrased: Facades visible from public rights of way shall use natural building materials that are considered to be permanent for 100 years. .... Low grade materials such as panelized "thin brick", fiber-cement or cementitious panel siding, shall not be used on facades visible from public rights of way.	Requesting a waiver for the use of materials listed as "low grade".	In the intervening years since the design standard was written, the quality of these materials has improved significantly and they may now be considered long lasting. Fiber cement is currently seen in many high quality projects throughout Portland.

9. CONSISTENCY WITH PORTLAND DESIGN STANDARDS

Section 14-526 of the City of Portland's Land Use Code outlines the site plan standards that must be met by Level III Site Plan projects. The proposed development will follow the City's design standards as described in the following section.

9.1 Transportation

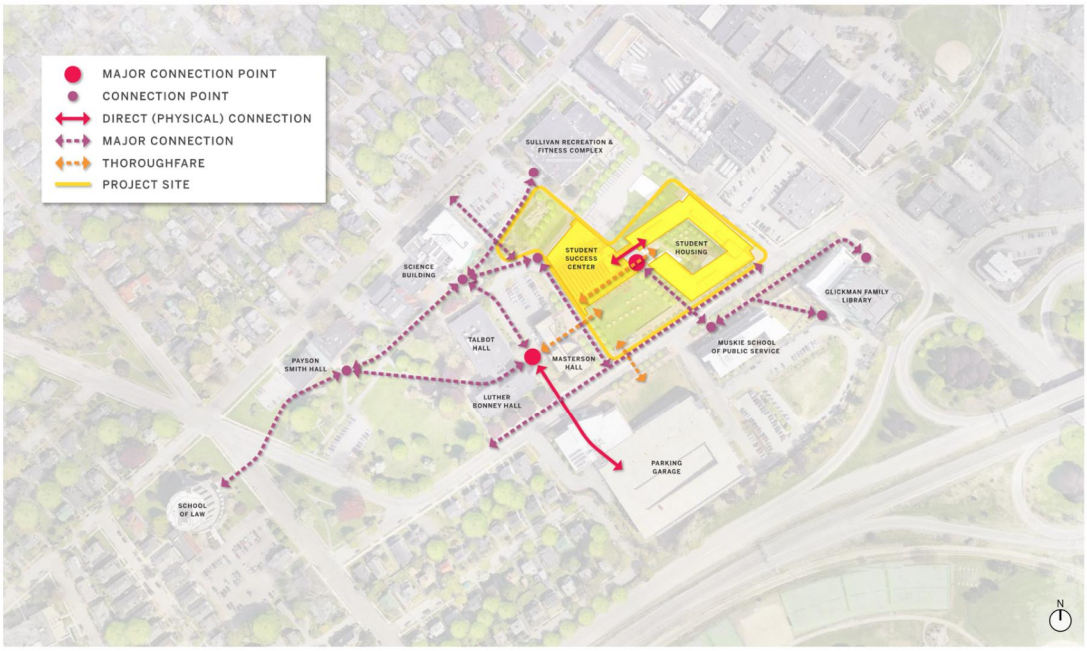
1. *Impact on Surrounding Street Systems*
   A Traffic Impact Study (TIS) was prepared by VHB for the proposed project and is attached. This study included an analysis for the proposed CSSC and the Residence Hall. Although a planned parking garage is not part of this application, the impacts from the garage were included. The analysis also incorporates the proposed Deering's Corner Roundabout, which will be constructed by the City in the next two years.

   The addition of the dormitory beds to the campus is anticipated to reduce vehicle trips as commuters convert to on-campus residences. The student center is expected to better serve the existing student population and is not expected to increase trips to the campus except perhaps for special events. In the future, with optimistic enrollment increases, and conservative methodology, vehicular trips are anticipated to increase between 163 and 174 during the weekday AM and PM peak hours. With these trips added to the roadway network, delay increases will be minimal at the signalized intersections along Forest Avenue and at the proposed roundabout at Falmouth Street and Brighton and Deering Avenues. Overall, this proposed project is not intended to adversely impact traffic operations in the vicinity of the USM campus.

2. *Access and Circulation*

   Pedestrian circulation on the USM campus is a priority and this project will maintain existing patterns and establish new circulation from its new uses. Pedestrian access along Bedford Street will be maintained through reconstruction of the existing sidewalk and a new sidewalk is proposed along Durham Street. The sites selected for the two new buildings were intended to enhance circulation and avoid pedestrian impacts. The site for the Residence Hall was previously covered by service areas that were non-student related and consequently avoids impacts to existing pedestrian corridors. The Career and Student Success Center is intended to be a building that students can conveniently and frequently access and subsequently its site is centrally located adjacent to several existing pedestrian corridors. Campus circulation is shown in the diagram below.

Campus Circulation Diagram



The University of Maine System is a Title II entity for ADA compliance and is committed to serving all campus populations. ADA accessibility will be provided for all pedestrian corridors associated with the project and access to the two new buildings. ADA parking specifically for the CSSC and Residence Hall will be provided in a future parking garage. There will continue to be ADA parking available in the Luther Bonney/Masterton Lot. It is noted that the courtyard of the Residence Hall is not intended as a public area and accommodated, controlled access will be provided through the building.

Vehicle access to the project areas is generally unchanged or improved by the project. Vehicle accesses to the service areas at the corner of Bedford and Durham will be removed and the existing vehicle access to the Central Heating Facility from Durham will be used to provide service areas to the CSSC. Access to the fuel tank off Durham will be maintained for fueling and maintenance and serve a dual-purpose to access mechanical areas on the ground floor of the Residence Hall.

There are no drive-up features associated with this project.

3. *Loading & Servicing*

An existing service area adjacent to the Central Heating Plant will be expanded to include new access to the CSSC and associated utilities. The CSSC will include a formal loading dock area facing Durham Street and include internal receiving and storage areas to support its bookstore, dining areas, and other student gathering uses. Typical delivery vehicles are anticipated to be food and beverage vehicles, shipping and delivery vehicles (i.e. USPS and UPS), and campus catering vehicles. Two solid waste compactors with removable dumpsters will be relocated from an existing facility off Durham Street to the loading dock area and will continue to serve as the Portland campus collector. During construction the solid waste compactors will be temporarily located on the NE corner of the Sullivan building, as described in the Construction Management Plan in Section 13. The new service area will also include parking for dining and facilities management vehicles and provide access to utility infrastructure including electric,

telecom, and emergency power. A new service access to an existing fuel tank will be created from Durham Street adjacent to a Residence Hall entrance that will also serve as an emergency and service access.

A truck turning area of 65-foot radius will be provided at the head of the loading area which is anticipated to accommodate single unit trucks up to 40 ft in length including the dumpster vehicles. Larger vehicles (i.e. dual unit trucks with 30 to 40 ft trailers) will back in from Durham Street which is consistent with existing large vehicle access to the Central Heating building and adjacent Oakhurst Dairy operations. Sketches created with AutoTurn software are enclosed as the basis of design.

4. *Sidewalks*

The project area that fronts on Bedford Street presently has a 6' bituminous sidewalk in poor condition. There is presently no formal sidewalk for the project area that fronts on Durham Street. The new Residence Hall will be located at a 10-foot setback from the property line on Bedford St. and 4' on Durham Street. A new 10' foot wide concrete sidewalk will be constructed along the face of the residence hall along Bedford to foster a streetscape/boulevard setting consistent with the public offices on the ground floor. A 10' wide esplanade will be constructed along the curb with a bioretention cell and street trees. A new 6-foot concrete sidewalk will be constructed along the Durham Street frontage in the right of way with a 6-foot landscaping buffer between the sidewalk and the building. This layout is consistent with establishing separation to the residents' rooms on the ground floor.

Existing crosswalks for Bedford and Durham Streets will be maintained and new ADA ramps and features will be constructed consistent with the City's Technical Manual at existing crosswalks and street corners.

Sidewalks in the interior of the site will range from 8 to 16 feet in width depending upon anticipated traffic and will be constructed of concrete.

5. *Public Transit Access*

No changes to public transit access are proposed as part of this project. There is an existing Metro stop located on Bedford Street near the southwest corner of the project that will be maintained in its current location during construction.

6. *Parking*

There are no proposed parking areas included in this project. The existing parking in the vicinity of the Central Heating Plant will be reconfigured and maintained.

To address parking on a campus-wide basis, the University commissioned a Parking Assessment in late 2019, and the study was completed in January of 2020. A copy of the Assessment is attached. The study was developed to provide a comprehensive profile of the current on-campus parking conditions and estimate future parking demand based on projections in student enrollment, employment growth, and changes to campus activities. It specifically included the completion of the Career and Student Success Center and the new Residence Hall in 2022 in its analysis.

Summarized findings of the Parking Analysis are as follows:

- The current (2019) parking capacity is 1,701
- The current peak parking hour is at 1pm and is 1,587 spaces, or 93%

- With construction of the Career and Student Success Center and Residence Hall, new parking capacity will be needed. See the attached parking analysis for the estimated demand for parking compared to supply over the course of future years.
- A moderately aggressive Transportation Demand Management (TDM) program could result in reductions of up to twelve percent for USM. The TDM is described in more detail in item (8) below.
- The expansion of the Wishcamper Parking Lot in 2020[1] will offset the anticipated loss of parking spaces in the Woodbury lot where the new Campus Quad will be located.

As evidenced in the Parking Analysis, additional parking will be required on campus to accommodate the needs of the new Residence Hall which is planned for occupancy in August of 2022. The University had a second study completed by Platz Associates to look at options to provide new structured parking on campus. This study considered two options: (1) a new parking structure located in the existing Sullivan Gym parking area on 68 Falmouth Street; and (2) expansion of the existing parking garage located on Bedford Street. There were several scenarios evaluated for each site.

The University has reviewed the options and will be pursuing a structured parking solution on the 68 Falmouth Street lot. It will be a multi-level structure and include primary access from Falmouth Street. It is expected that the new garage will provide approximately 400-500 parking spaces and may include a pedestrian skybridge to the new Career and Student Success Center, although the skybridge is not part of this project. The option of locating Campus Safety services within the garage is also being considered. It is anticipated that the new garage on Falmouth Street would be primarily used by residence hall students, so that the impacts of day to day trip generation will be significantly less than the garage located on Bedford Street. The new parking garage will require a Level III Site Plan approval from the City of Portland. The Site Plan Approvals for the garage will be pursued separately from this project.

The University is currently seeking approval from the Board of Trustees (BOT) in March of 2020 to solicit proposals for the design and permitting of the new structured parking. The anticipated schedule for development and construction of the project includes submitting for Site Plan Approval in mid-2020, anticipated approvals by late 2020, and construction of the garage being completed by the summer of 2022, and fully operational by August of 2022, before the new Residence Hall is occupied. A more thorough analysis of the proposed parking garage will be included with the Level III Site Plan application. We expect that a condition of the Certificate of Occupancy for the Residence Hall will be occupancy of the parking structure.

Bike Parking

The project will restore existing bicycle parking in the vicinity of the Woodbury Center and accommodate residents who bring bikes to campus. Exterior bike racks will be provided at the Student Success Center to accommodate student commuters. These racks, accommodating 35-60 bicycles, will be provided on hardscape surfaces and be "lockable" City-approved DERO Bike Hitch model. The residence hall will include an internal bike storage room for storage of resident bikes with direct access from the Bedford Street sidewalk. The bike storage room will be secured and allow for residents to secure their bikes in racks.

[1] A Level III Site Olan application for the expansion of the Wishcamper Parking Lot is currently under review by the City.

7. Snow Storage

   A snow management plan has been prepared through coordination with the USM Office of Facilities Management (OFM). The OFM is responsible for snow removal clearing on campus and this plan reflects campus priorities and resources. Snow storage areas are indicated on the site layout drawing. These snow storage areas are commonly short-term as the campus actively manages the amount of snow received and periodically removes snow from campus areas to retain capacity for future storms When necessary, snow is removed from campus by commercial contractor for lawful disposal.

8. *Transportation Demand Management (TDM)*
   The University of Southern Maine (USM) has recently developed a Transportation Demand Management (TDM) plan that provides a cohesive strategy for establishing and implementing a successful TDM program for the Portland campus. The TDM plan seeks to enhance multimodal accessibility, ensure the use of non-vehicular modes, and discourage the use of driving through parking management, to achieve and build upon the university's parking demand reduction goals for the campus. The TDM Plan presents a suite of strategies and timeframe for when USM intends to implement the various strategies. The strategies aim at promoting walking and bicycling, improving transit service to promote ridership, promoting carpooling, changing time-of-day travel demands to eliminate or reduce vehicle trips, and managing parking demand via changes to USM's pricing and permit policies. The implementation of the TDM will reduce the vehicle trips to the site and reduce delays at area intersections. The draft TDM Plan prepared by VHB is attached.

9.2 Environmental & Landscape Features

1. *Preservation of Significant Natural Features*
   The Site has been previously developed and there are no known areas of significant natural features, including unusual natural areas, rare or endangered botanical features, areas of significant wildlife habitats, or wetland areas. The attached Official Species List identifies the northern long-eared bat, which has been listed as a Federally Threatened Species, in association with the project area (a common designation across the state); however, there are no critical habitat areas located within the project area.

2. *Landscaping & Landscape Preservation*
   This project does not impact any trees greater than ten (10) inches DBH or greater within any required zoning setback area.

3. *Site Landscaping & Street Trees*
   Landscaping for the new CSSC and Residence Hall will be consistent with other campus landscaping improvements including landscape treatments associated with the Wishcamper Building. Landscaping will consist of street trees, accent trees, perennials and shrubs and lawn areas. The main landscape feature of the project will be a large open lawn area in front of the CSSC to create a Campus Quad. Landscaping will be provided to augment campus aesthetics, screen discordant uses (service area and residence hall), manage stormwater and provide recreation areas. The CSSC is intended to be a LEED certified building and as such plant species will be selected to be native or adaptive native plants that require minimal maintenance and be appropriate for the Portland climate.

   Landscaping features and vegetation will be used to improve site aesthetics and accent the new buildings. Planting plans with plant schedules and sizes have been provided consistent with the City's Technical Manual.

There are presently no heritage or feature trees on the project site to preserve. Street trees will be provided along the Bedford frontages in accordance with City requirements. The esplanade along Bedford Street will be constructed to contain sufficient planting soil to provide supportive growth conditions for proposed street trees.

Landscaping Plans are included in the drawings referenced in Section 3 of this Report.

9.3 Environmental & Stormwater

1. *Water Quality, Stormwater Management & Erosion Control*
   The project must comply with the water quality, stormwater management, and erosion control standards identified by the City of Portland in the Land Use Chapter of the Code of Ordinances, as well as the MaineDEP Chapter 500 Stormwater Standards associated with Site Location of Development Act Permit requirements. The Stormwater Management Plan included with this application demonstrates that the proposed development meets the applicable standards.

   The project has been designed to minimize the impact of stormwater leaving the site. The project will not result in the flooding of adjacent lots or City property. Additionally, the project is not located within the watershed of an Urban Impaired Stream and is not anticipated to pose a risk of groundwater contamination during or after construction. Erosion and sediment control measures are described in the attached Stormwater Management Plan and detailed on the drawings. The project has also been designed to provide for the adequate and sanitary disposal of sewage, as further described in Section 14 of this Report.

9.4 Public Infrastructure & Safety

1. *Consistency with City Master Plan*
   The development's consistency with City Master Plan is described in Section 11 of this Report.

2. *Public Safety and Fire Prevention*

   The project has considered public safety and fire prevention measures in its design. The concept of Crime Prevention Through Environmental Design (CPTED) has been incorporated by maximizing visibility, eliminating escape routes, avoiding concealment near pedestrian areas, and associated lighting. Landscaping plant varieties and locations have been selected to maintain visual corridors and view ways.

   Emergency vehicle access to the two new buildings has been provided and existing access to other buildings maintained.

   Compliance with the Portland Fire Department Site Review Checklist is described in Section 16 of this Report.

3. *Availability and Adequate Capacity of Public Utilities*
   The availability and adequate capacity of public utilities is described in Section 15 of this Report.

9.5 Site Design

1. *Massing, ventilation, and wind impact*

The two buildings have been sited consistent with the USM Facilities Master Plan and in accordance with the USM Overlay District and design standards in order to be consistent with existing building massing. The Residence Hall has been sited at the lowest grade on the campus to de-emphasis its 8-story height in addition to massing the 8-story portion of the building away from Bedford Street. The existing Glickman Library with 7 stories is across Bedford Street from the Residence Hall and the two buildings will be complimentary in their size and height. The CSSC was sited to be generally the center of campus and will be a similar height or lower than adjacent buildings such as the Science Building and Masterton Hall. Mechanical units for the Career and Student Success Center will be located primarily in the penthouse with some equipment located on the rear roof. In the Residence Hall, the equipment will be on the roofs of both wings centered in the middle of the bar. There are no residential properties in the vicinity of the new buildings and there are no permanent noise sources proposed on the ground.

2. *Shadows*

A preliminary shadow analysis, identified in the Technical Manual, has been prepared due to the creation of two structures greater than 45 feet in height above grade. The attached preliminary shadow analysis shows the required shadow length calculation based upon the building designs and existing site conditions. The Career and Student Success Center shadow length was calculated to generally be on campus with some extension into the Durham Street right of way. The Residence Hall shadow length is approximately half on campus and half on other parcels northerly of the campus, including portions of the Durham Street, Bedford Street, and Forest Avenue right of ways. This analysis shows that there are no "significant public resource" areas impacted by the proposed project. No further analysis is required.

3. Snow and ice loading

The project has been designed to avoid snow and ice from loading or falling onto adjacent properties or public ways. The two new buildings will have flat roofs and will not shed snow or ice directly to the ground. Building entrances are designed to allow for egress and access safe from falling snow or ice.

4. View corridors

This project is not located within the limits of the Downtown Vision View Corridor Protection Plan, and therefore the massing, location, and height of the development does not substantially obstruct any view corridors identified in said Plan.

5. *Historic Resources*

This project is not located within, or within 100 feet, of any City Historic District. There are no known Historic Resources located within or within 100 feet of the project limits.

6. Exterior Lighting

Site lighting has been designed to support pedestrian ways, accent building entrances and provide security. Cut-off style lighting fixtures will be used to limit light intrusion off site.

The proposed exterior lighting is shown on the drawings. A lighting schedule, cut sheets, and photometric plan are attached.

7. Noise and Vibration

The proposed buildings will have a combination of roof-mounted and interior-located mechanical equipment for heating, ventilation, and air conditioning (HVAC). Two new generators with sound attenuating enclosures will be located in the service area near the existing generator, which is to remain.

Noise levels at present are minimal and are not known to have created an unreasonably adverse impact on the surrounding campus and industrial (Oakhurst) areas. Proposed noise levels are anticipated to be similar. The generators will be exercised weekly and not run continuously unless there is a power outage. Note that the generators are located within the service core and flanked by existing and proposed buildings, providing partial shielding of the sound. Cut sheets for the proposed generators and enclosures are attached

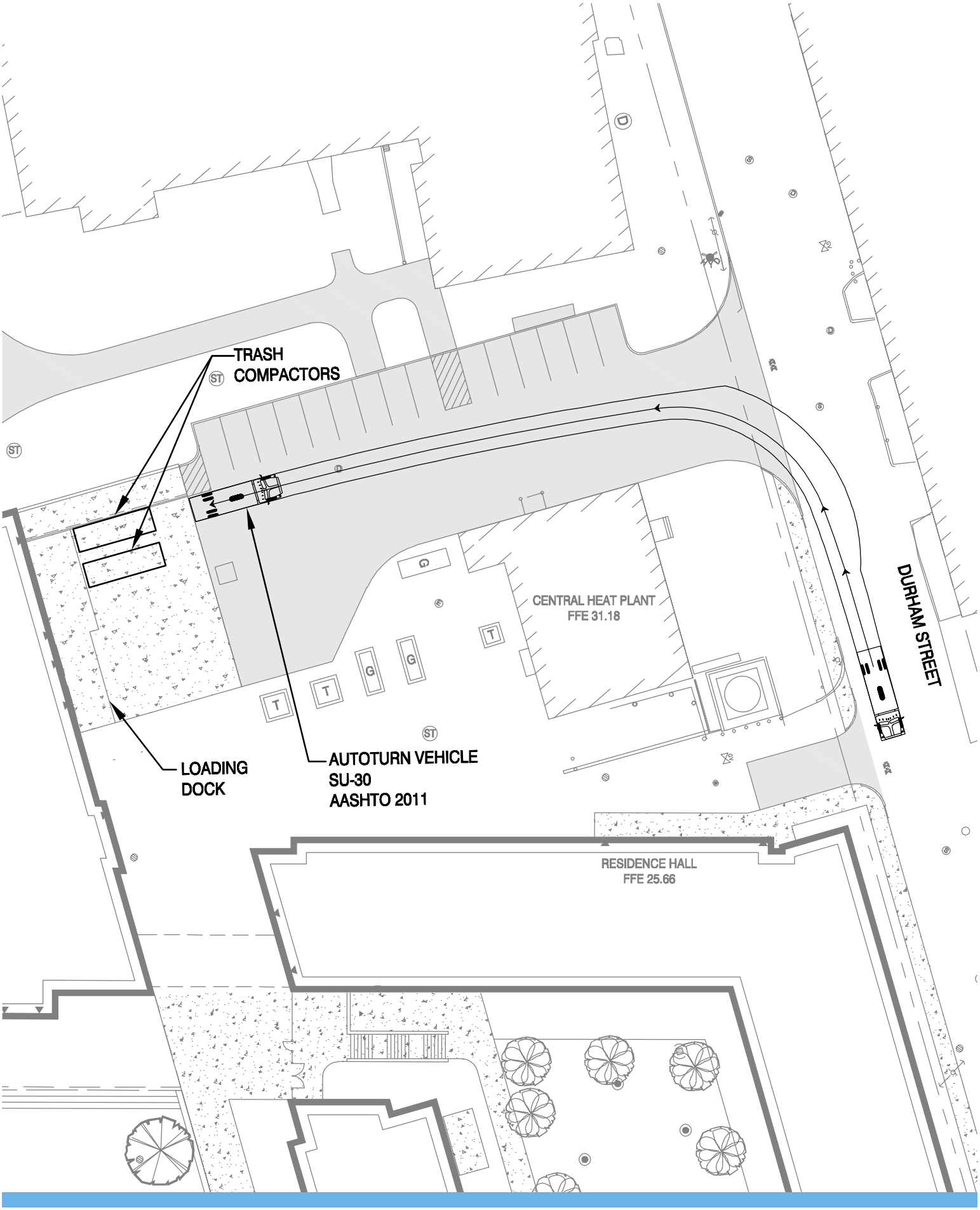
8. *Signage and Wayfinding*

   Campus signage and wayfinding has been provided on the drawings. The new signage will be related to the new buildings. The two new buildings will likely receive the ground or building mounted signs consistent with the campus standard that identifies all campus buildings at the street level.

9. *Zoning Related Design Standards*
   An assessment of the City Zoning requirements is provided in Section 11 of this Report.

9.6 Attachments

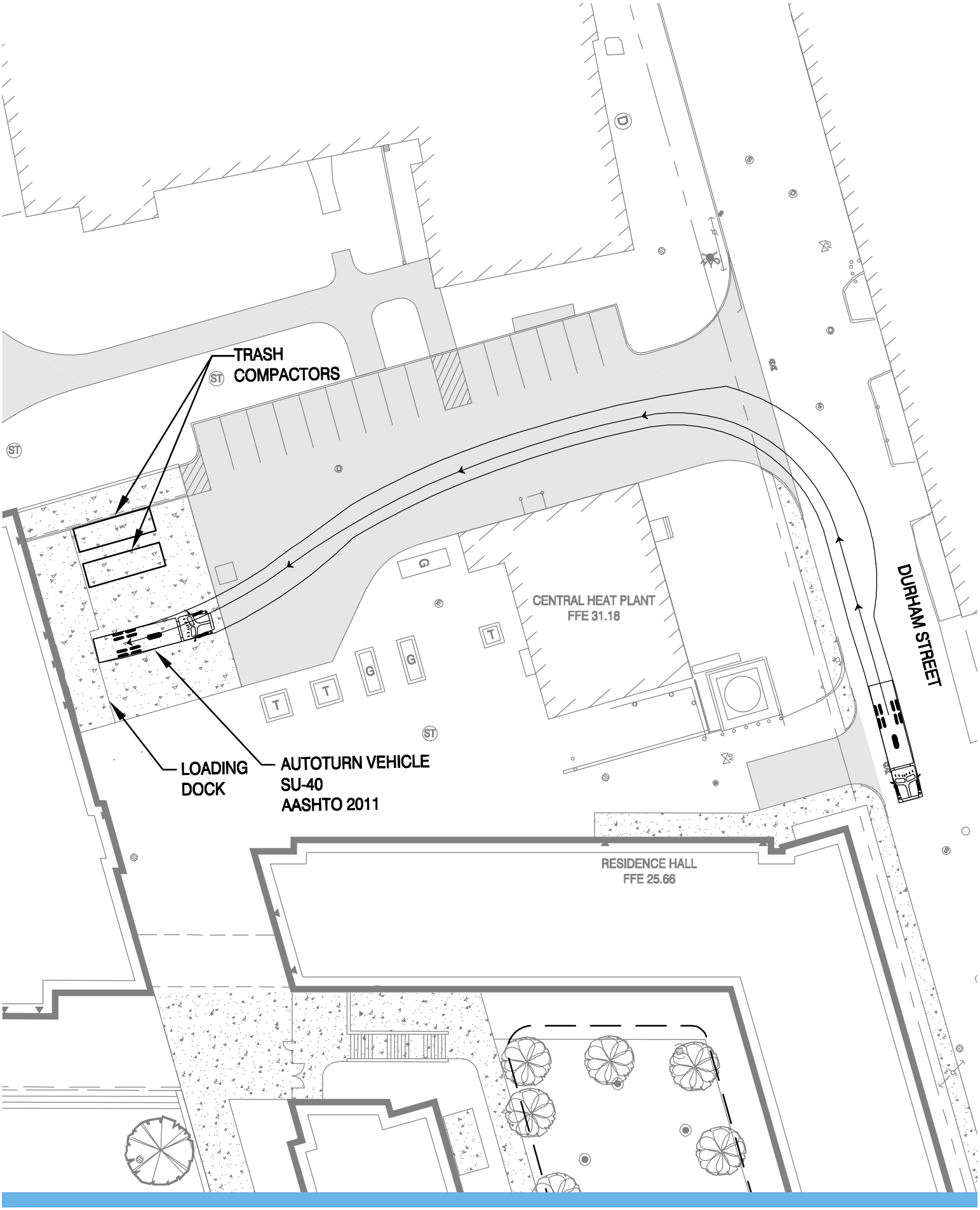
- Traffic Impact Analysis prepared by VHB (uploaded separately in Eplan)
- Truck Turning Movement Diagram
- Parking Analysis prepared by VHB (Uploaded separately to Eplan)
- Parking Feasibility Study by Platz Associates (Uploaded separately to Eplan)
- TDM Plan prepared by VHB (uploaded separately in Eplan)
- Official Species List
- Lighting Schedule, Photometric Plans & Cut Sheets
- Stormwater Management Plan (uploaded separately in Eplan)
- Preliminary Shadow Study
- Generator and Sound Enclosure Cut sheets



Truck Access-30' Box Truck
University of Southern Maine Reisdence Hall
March, 2020

SMRT PROJECT NO. 19206
0 40' 80' 160' 320'

SMRT



Truck Access-40' Trailer/Double Unit

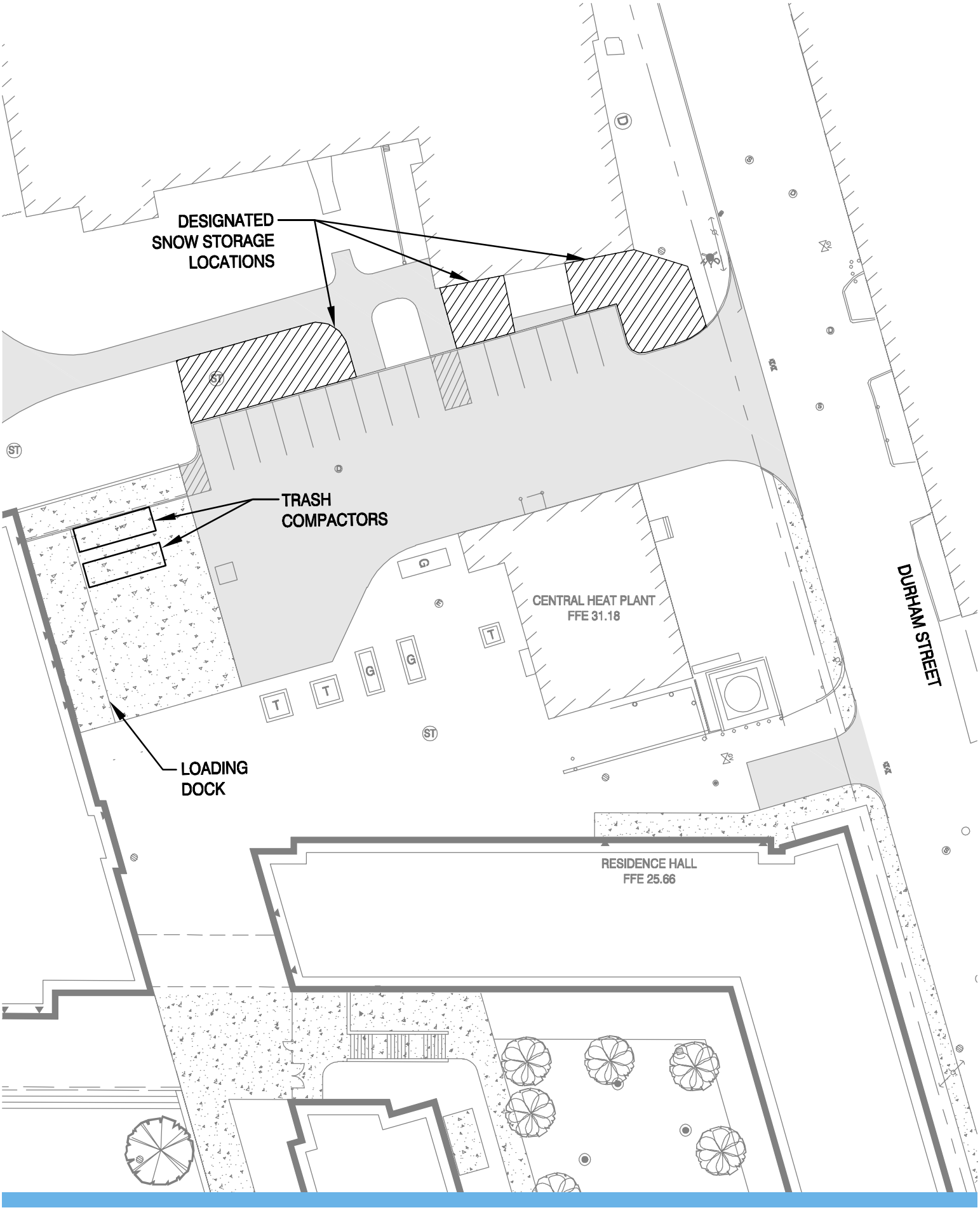
University of Southern Maine Reisdence Hall

March, 2020

SMRT PROJECT NO. 19206

0 40' 80' 160' 320'

SMRT



Snow Storage Sketch

University of Southern Maine Reisdence Hall

March, 2020

SMRT PROJECT NO. 19206

0 40' 80' 160' 320'

SMRT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: February 24, 2020
Consultation Code: 05E1ME00-2020-SLI-0740
Event Code: 05E1ME00-2020-E-02458
Project Name: USM Portland Student Housing

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2020-SLI-0740

Event Code: 05E1ME00-2020-E-02458

Project Name: USM Portland Student Housing

Project Type: DEVELOPMENT

Project Description: Proposed development on the USM Portland campus on the corner of Bedford Street and Durham Street in Portland, ME

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.6628773524905N70.27456771513867W



Counties: Cumberland, ME

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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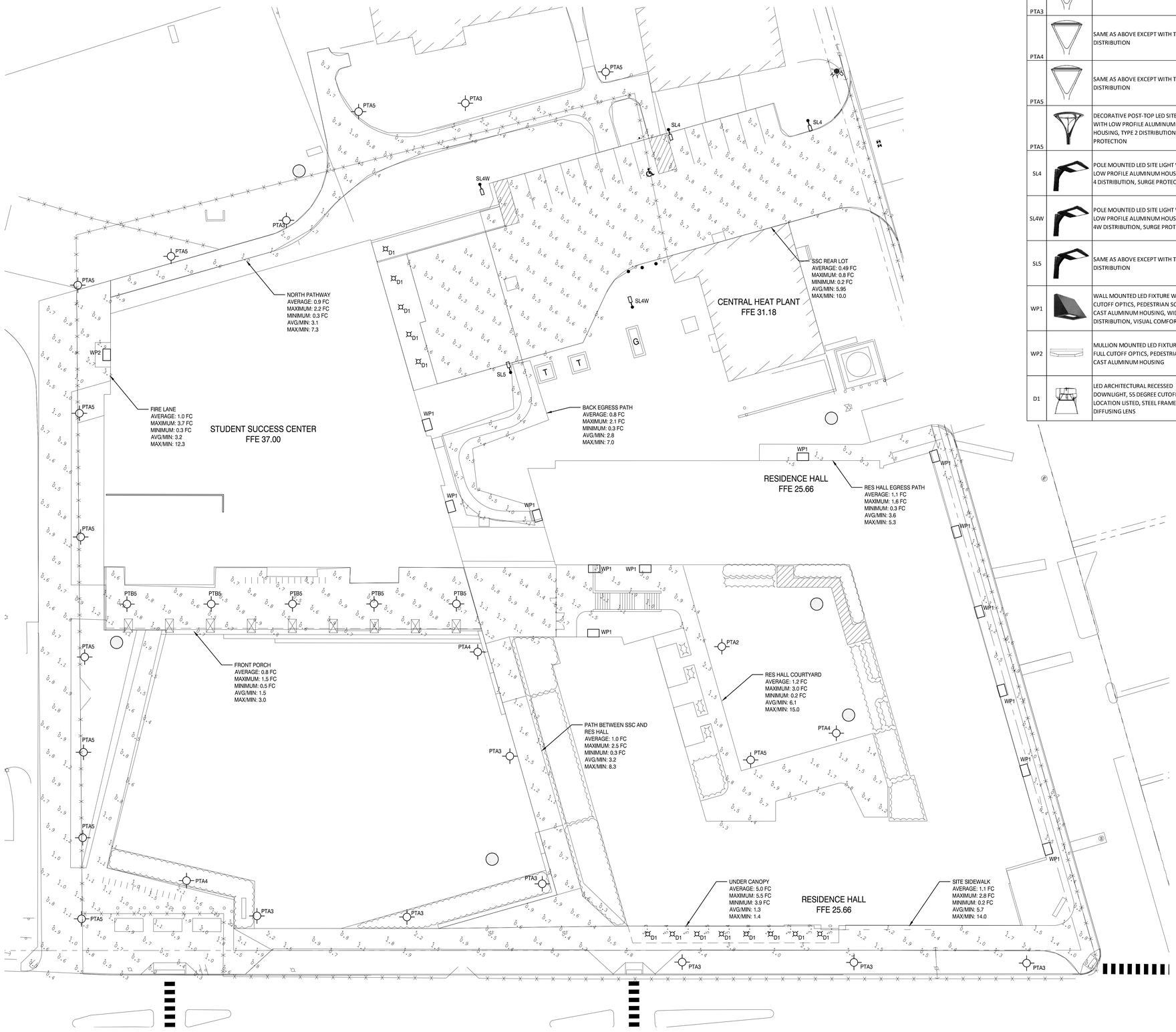
1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



SITE & LANDSCAPE LIGHTING SCHEDULE

LABEL	IMAGE	DESCRIPTION	MANUFACTURER & MODEL NUMBER	QUANTITY	BUG RATING	FULL CUTOFF?	WATTAGE	OUTPUT	CONTROL METHOD	MOUNTING	NOTES
PTA2		POST-TOP LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 2 DISTRIBUTION, SURGE PROTECTION	KIM LIGHTING UR20-24L-25-3K7-2-PT-UNV-BLT-SF	1	B1-U0-G1	YES	25 W	3,000 LUMENS	TIME CLOCK	12' TALL ROUND 4" OD ALUMINUM POLE	
PTA3		SAME AS ABOVE EXCEPT WITH TYPE 3 DISTRIBUTION	KIM LIGHTING UR20-24L-25-3K7-3-PT-UNV-BLT-SF	8	B1-U0-G1	YES	25 W	3,000 LUMENS	TIME CLOCK	ROUND 12' X 4" ALUMINUM POLE	
PTA4		SAME AS ABOVE EXCEPT WITH TYPE 4 DISTRIBUTION	KIM LIGHTING UR20-24L-25-3K7-4W-PT-UNV-BLT-SF	3	B1-U0-G2	YES	25 W	3,000 LUMENS	TIME CLOCK	ROUND 12' X 4" ALUMINUM POLE	
PTA5		SAME AS ABOVE EXCEPT WITH TYPE 5 DISTRIBUTION	KIM LIGHTING UR20-24L-25-3K7-5W-PT-UNV-BLT-WSP-40F1-5F	12	B2-U0-G1	YES	25 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 12' X 4" ALUMINUM POLE	
PTA5		DECORATIVE POST-TOP LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 2 DISTRIBUTION, SURGE PROTECTION	EATON LIGHTING ARB B1 LED D1 T5 DP	5	B2-U1-G1	NO	24 W	2,300 LUMENS	TIME CLOCK & MOTION SENSOR	DECORATIVE WOOD POLE	THIS FIXTURE HAS A SMALL UPLIGHT COMPONENT BUT IS MOUNTED UNDER A HIGH CANOPY
SL4		POLE MOUNTED LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 4 DISTRIBUTION, SURGE PROTECTION	KIM LIGHTING ALT1-28L-20-3K7-4-UNV-A34-BLT-NXSP30F-SF	2	B1-U0-G1	YES	20 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE	
SL4W		POLE MOUNTED LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 4W DISTRIBUTION, SURGE PROTECTION	KIM LIGHTING ALT1-28L-20-3K7-4W-UNV-A34-BLT-NXSP30F-SF	2	B1-U0-G1	YES	20 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE	
SL5		SAME AS ABOVE EXCEPT WITH TYPE 5 DISTRIBUTION	KIM LIGHTING ALT1-28L-20-3K7-5R-UNV-A34-BLT-NXSP30F-SF	1	B2-U0-G2	YES	20 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE	
WP1		WALL MOUNTED LED FIXTURE WITH FULL CUTOFF OPTICS, PEDESTRIAN SCALE, CAST ALUMINUM HOUSING, WIDE DISTRIBUTION, VISUAL COMFORT LENS	LITHONIA WDGE2-LED-P1-30K-80CRI-VW-MVOLT-PIRH-DBLBXD	14	B0-U0-G0	YES	10 W	1,200 LUMENS	TIME CLOCK & MOTION SENSOR	SURFACE, 12' AFG	
WP2		MULLION MOUNTED LED FIXTURE WITH FULL CUTOFF OPTICS, PEDESTRIAN SCALE, CAST ALUMINUM HOUSING	LUMINAIRE LED BLD 36-15W 3000K BLK OCC	1	B0-U0-G0	YES	15 W	1,500 LUMENS	TIME CLOCK & MOTION SENSOR	SURFACE, 8' AFG	
D1		LED ARCHITECTURAL RECESSED DOWNLIGHT, 55 DEGREE CUTOFF, WET LOCATION LISTED, STEEL FRAME, DIFFUSING LENS	LITHONIA LDN4-30-05-LO4AR-LSS-MVOLT-EZ1	13	NA	YES	6 W	500 LUMENS	TIME CLOCK	RECESSED	

REV	DESCRIPTION	DATE
0	ISSUED FOR SD AND PERMITTING	3-6-20

ISSUED FOR SD AND PERMITTING
3-6-20
CURRENT ISSUE STATUS:

TRUE NORTH:

WILLIAM R. HALL No. 7860 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

SMRT Architects and Engineers
144 Fore Street/P.O. Box 618
Portland, Maine 04104
1.877.700.7678
www.smrtinc.com

UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PHOTOMETRIC PLAN

SHEET TITLE:

SCALE: 1" = 20'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	WRH		
JOB CAPTAIN:	SDL		ES103
DRAWN BY:	RBB		
SMRT FILE:	ES103-19206	SHEET No.	

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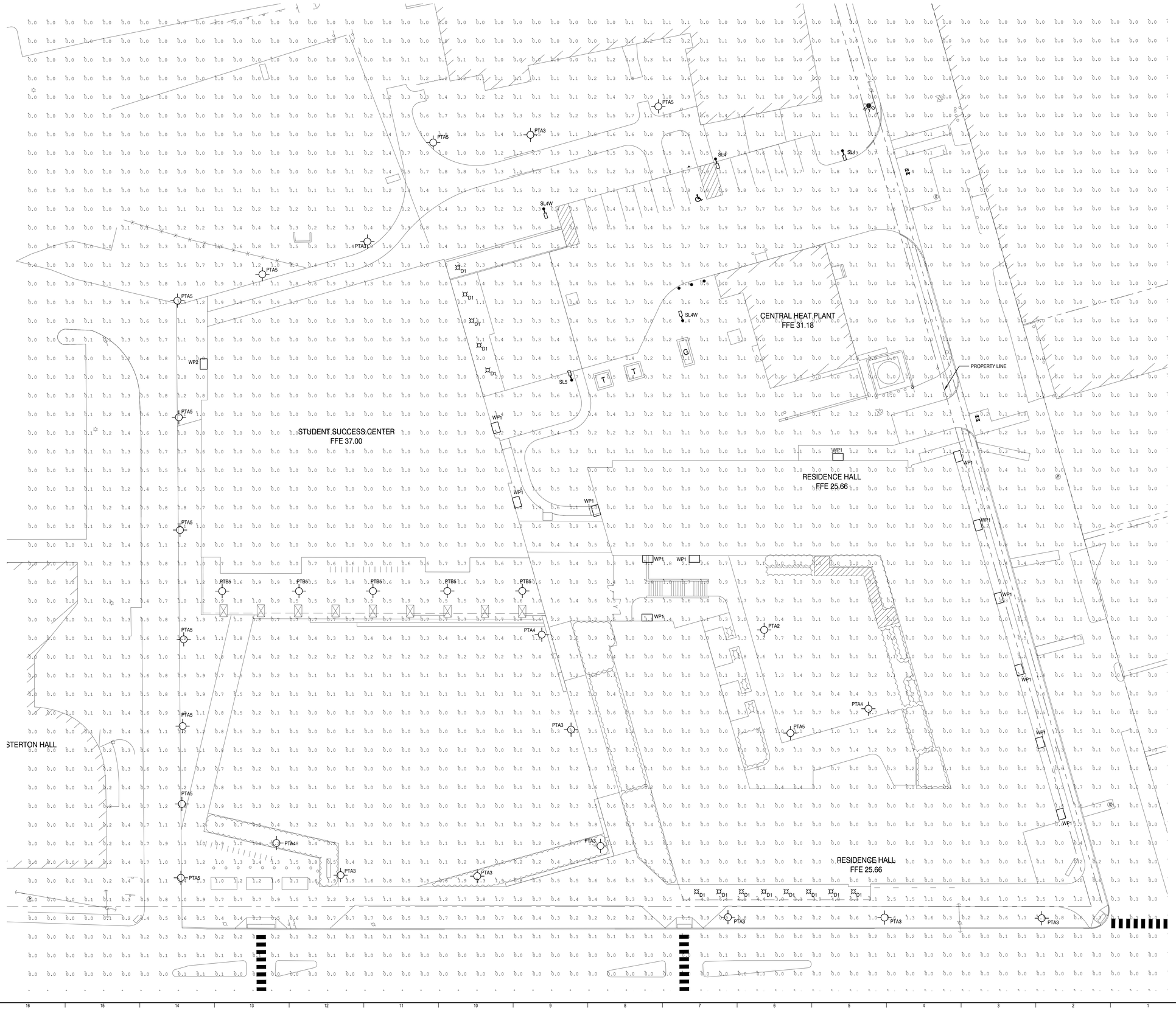

REV	DESCRIPTION	DATE
0	ISSUED FOR SD AND PERMITTING	3-6-20

ISSUED FOR SD AND PERMITTING
3-6-20

CURRENT ISSUE STATUS:

TRUE NORTH:

STATE OF MAINE
WILLIAM R. HALL
No. 7860
LICENSED
PROFESSIONAL ENGINEER

SMRT
Architecture • Engineering • Planning
SMRT Architects and Engineers
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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PHOTOMETRIC PLAN

SHEET TITLE:

0 10' 20' 40' 30'

SCALE: 1" = 20'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	WRH		
JOB CAPTAIN:	SDL		ES104
DRAWN BY:	RBB		
SMRT FILE:	ES104-19206	SHEET No.	

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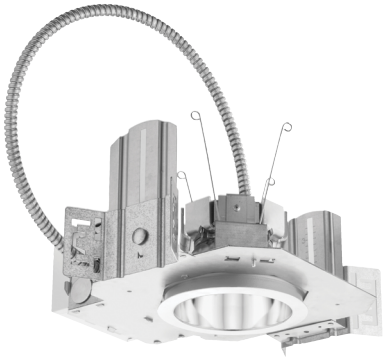
NOT FOR CONSTRUCTION

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

LDN4

4" OPEN
Non-IC
New Construction Downlight



FEATURES & SPECIFICATIONS

INTENDED USE — Typical applications include corridors, lobbies, conference rooms and private offices.

CONSTRUCTION — Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches. Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination 1/2"-3/4" and four 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C standard; high ambient (40°C) option available. Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

OPTICS — LEDs are binned to a 3-step SDCM; 80 CRI minimum. 90 CRI optional.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in specular, semi-specular, or matte diffuse finishes. Also available in white and black painted reflectors.

ELECTRICAL — Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% or 1% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 60,000 hours.

LISTINGS — Certified to US and Canadian safety standards. Wet location standard (covered ceiling). IP55 rated. ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

battery pack

A+ Capable options indicated by this color background.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LDN4 35/15 LO4AR LSS MVOLT EZ1

LDN4												
Series		**Color temperature**		**Lumens**[1]		**Aperture/Trim Color**				**Finish**		**Voltage**	
LDN4	4" round	27/	2700K	05	500 lumens	LO4	Downlight	AR	Clear	LSS	Semi-specular	MVOLT	Multi-volt
		30/	3000K	07	750 lumens	LW4	Wallwash	WR[2]	White	LD	Matte diffuse	120	120V
		35/	3500K	10	1000 lumens			BR[2]	Black	LS	Specular	277	277V
		40/	4000K	15	1500 lumens							347[3]	347V
		50/	5000K	20	2000 lumens								
				25	2500 lumens								
				30	3000 lumens								
				40	4000 lumens								

Driver		**Options**		**Options**	
GZ10	0-10V driver dims to 10%	SF[4]	Single fuse	N80[8]	nLight™ Lumen Compensation
GZ1	0-10V driver dims to 1%	TRW[6]	White painted flange	NPS80EZ[7,10]	nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1).
EZ10	0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 10%	TRBL[6]	Black painted flange	NPS80EZER[7,10]	nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1). ER controls fixtures on emergency circuit.
EZ1	0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 1%	EL[5]	Emergency battery pack with integral test switch. 10W Constant Power, Not Certified in CA Title 20 MAEDBS	HAO[11]	High ambient option (40°C)
		ELR[5]	Emergency battery pack with remote test switch. 10W Constant Power, Not Certified in CA Title 20 MAEDBS	CP[12]	Chicago Plenum
		ELSD[5]	Emergency battery pack with self-diagnostics, 10W Constant Power, integral test switch. Not Certified in CA Title 20 MAEDBS	RRL__	RELOC®-ready luminaire connectors enable a simple and consistent factory installed option across all ABL luminaire brands. Refer to RRL for complete nomenclature. Available only in RRLA, RRLB, RRLAE, and RRLC12S.
		ELRSD[5]	Emergency battery pack with self-diagnostics, 10W Constant Power, remote test switch. Not Certified in CA Title 20 MAEDBS	NLTAIR2[8,9]	nLight® Air enabled
		E10WCP[5]	Emergency battery pack, 10W Constant Power with integral test switch. Certified in CA Title 20 MAEDBS	NLTAIRER2[9,10]	nLight® AIR Dimming Pack Wireless Controls. Controls fixtures on emergency circuit, not available with battery pack options
		E10WCPR[5]	Emergency battery pack, 10W Constant Power with remote test switch. Certified in CA Title 20 MAEDBS	USPOM	US point of manufacture
		NPP16D[7,10]	nLight® network power/relay pack with 0-10V dimming for non-eldoLED drivers (GZ10, GZ1).	90CRI	High CRI (90+)
		NPP16DER[7,10]	nLight® network power/relay pack with 0-10V dimming for non-eldoLED drivers (GZ10, GZ1). ER controls fixtures on emergency circuit.		

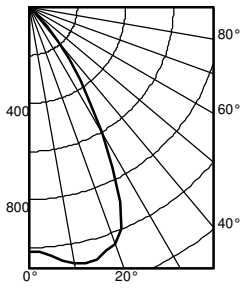
Notes

1 Overall height varies based on lumen package; refer to dimensional chart on page 3.
2 Not available with finishes.
3 Not available with emergency options.
4 Must specify voltage 120V or 277V.
5 12.5" of plenum depth or top access required for battery pack maintenance.
6 Available with clear (AR) reflector only.
7 Specify voltage. ER for use with generator supply EM power. Will require an emergency hot feed and normal hot feed.
8 Fixture begins at 80% light level. Must be specified with NPS80EZ or NPS80EZ ER. Only available with EZ10 and EZ1 drivers.
9 Not available with CP, NPS80EZ, NPS80EZER, NPP16D, NPP16DER or N80 options.
10 NLTAIR2 and NLTAIRER2 not recommended for metal ceiling installations.
11 Fixture height is 5-11/16" for all lumen packages with HAO.
12 Must specify voltage for 3000lm. Not available with emergency battery pack option.

PHOTOMETRY

Distribution Curve | **Distribution Data** | **Output Data** | **Coefficient of Utilization** | **Illuminance Data at 30" Above Floor for a Single Luminaire**

LDN4 35/10 LO4AR, input watts: 10.58, delivered lumens: 1085.2, LM/W = 102.57, spacing criterion at 0= 1.04, test no. ISF 30712P229.



	Ave	Lumens
0	1017	
5	1039	101
15	1084	304
25	895	395
35	369	232
45	52	51
55	1	2
65	1	1
75	0	0
85	0	0
90	0	

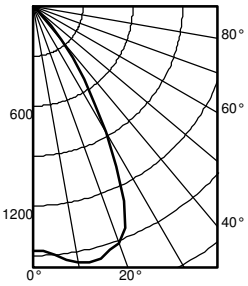
Zone	Lumens	% Lamp
0° - 30°	799.7	73.7
0° - 40°	1031.5	95.1
0° - 60°	1084.7	100.0
0° - 90°	1085.2	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	1085.2	*100.0

*Efficiency

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	33.6	5.8	16.8	8.9	3.4
10.0	18.1	7.9	9.0	12.2	1.8
12.0	11.3	10.0	5.6	15.4	1.1
14.0	7.7	12.1	3.8	18.6	0.8
16.0	5.6	14.2	2.8	21.9	0.6

LDN4 35/15 LO4AR, input watts: 17.5, delivered lumens: 1570.1, LM/W = 89.72, spacing criterion at 0= 1.04, test no. ISF 30712P234.



	Ave	Lumens
0	1472	
5	1503	146
15	1569	440
25	1295	571
35	534	335
45	75	74
55	1	3
65	1	1
75	0	0
85	0	0
90	0	

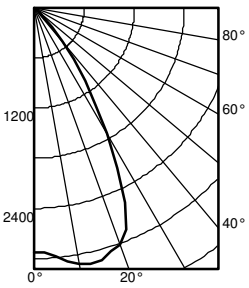
Zone	Lumens	% Lamp
0° - 30°	1157.1	73.7
0° - 40°	1492.5	95.1
0° - 60°	1569.4	100.0
0° - 90°	1570.1	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	1570.1	*100.0

*Efficiency

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	48.7	5.8	24.3	8.9	4.9
10.0	26.2	7.9	13.1	12.2	2.6
12.0	16.3	10.0	8.2	15.4	1.6
14.0	11.1	12.1	5.6	18.6	1.1
16.0	8.1	14.2	4.0	21.9	0.8

LDN4 35/30 LO4AR, input watts: 32.1, delivered lumens: 3122.6, LM/W = 88.52, spacing criterion at 0= 1.04, test no. ISF 30712P249.



	Ave	Lumens
0	2927	
5	2989	290
15	3120	875
25	2575	1136
35	1062	667
45	149	148
55	3	5
65	2	1
75	0	0
85	0	0
90	0	

Zone	Lumens	% Lamp
0° - 30°	2301.2	73.7
0° - 40°	2968.2	95.1
0° - 60°	3121.1	100.0
0° - 90°	3122.6	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	3122.6	*100.0

*Efficiency

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	96.8	5.8	48.4	8.9	9.7
10.0	52.0	7.9	26.0	12.2	5.2
12.0	32.4	10.0	16.2	15.4	3.2
14.0	22.1	12.1	11.1	18.6	2.2
16.0	16.1	14.2	8.0	21.9	1.6

Accessories: *Order as separate catalog numbers (shipped separately).*

SCA4	Sloped ceiling adapter. Degree of slope must be specified (5D, 10D, 15D, 20D, 25D, 30D). Refer to TECH-190.

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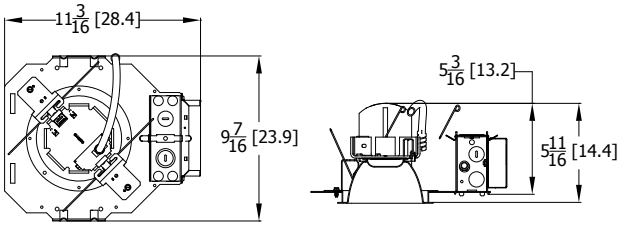
LDN4

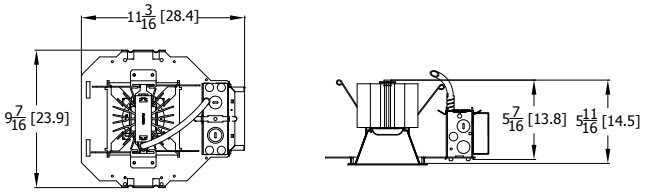
* All dimensions are inches (centimeters) unless otherwise noted.

LDN4 500-1500 LUMEN



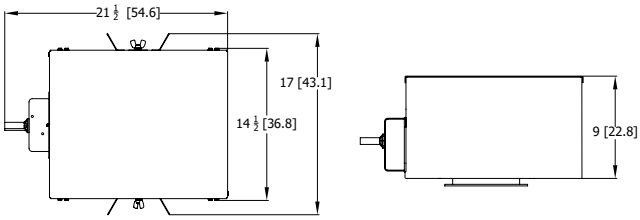
Aperture: 4-5/16 (11)
Ceiling Opening: 5-1/8 (13)
Overlap trim: 5-7/16 (13.8)

LDN4 2000-3000 LUMEN



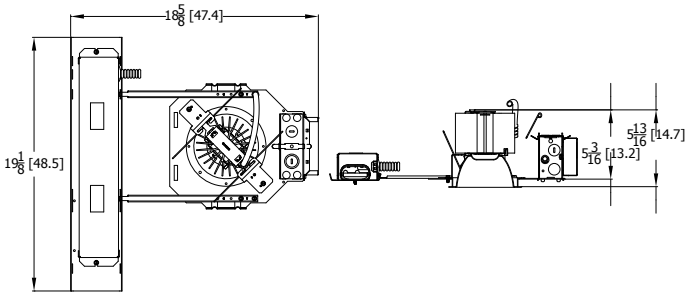
Aperture: 4-5/16 (11) Square
Ceiling Opening: 5-1/8 (13) Square
Overlap trim: 5-7/16 (13.8) Square

LDN4 CP



Aperture: 4-5/16? (11)
Ceiling Opening: 5-1/8? (13)
Overlap trim: 5-7/16? (13.8)

LDN4 EL-ELR



Aperture: 4-5/16 (11)
Ceiling Opening: 5-1/8 (13)
Overlap trim: 5-7/16 (13.8)

LDN4			
Nominal	**Lumens**	**Wattage**	**Lm/W**
500	523.6	5.74	91.2
750	751.1	8.6	87.3
1000	1045	10.58	98.8
1500	1512	17.5	86.4
2000	2006	22.12	90.7
2500	2551	26.1	97.7
3000	3007	32.1	93.7
4000	4212	43	98.0

LUMEN OUTPUT MULTIPLIERS - CCT					
	2700K	**3000K**	**3500K**	**4000K**	**5000K**
80CRI	0.950	0.966	1.000	1.025	1.101

HOW TO ESTIMATE DELIVERED LUMENS IN EMERGENCY MODE

Use the formula below to estimate the delivered lumens in emergency mode

Delivered Lumens = 1.25 x P x LPW

P = Ouput power of emergency driver. P = 10W for PS1055CP

LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet.
The LPW rating is also available at Designlight Consortium.

LUMEN OUTPUT MULTIPLIERS - FINISH			
	Clear (AR)	**White (WR)**	**Black (BR)**
Specular (LS)	1.0	N/A	N/A
Semi-specular (LSS)	0.950	N/A	N/A
Matte diffuse (LD)	0.85	N/A	N/A
Painted	N/A	0.87	0.73

Notes

- Tested in accordance with IESNA LM-79-08.
- Tested to current IES and NEMA standards under stabilized laboratory conditions.
- CRI: 80 typical.

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ADDITIONAL DATA

COMPATIBLE 0-10V WALL-MOUNT DIMMERS		
MANUFACTURER	PART NO.	POWER BOOSTER AVAILABLE
Lutron®	Diva® DVTV	
	Diva® DVSCTV	
	Nova T® NTFTV	
	Nova® NFTV	
Leviton®	AWSMT-7DW	CN100
	AWSMG-7DW	PE300
	AMRMG-7DW	
	Leviton Centura Fluorescent Control System	
	IllumaTech® IP7 Series	
Synergy®	ISD BC	RDMFC
	SLD LPCS	
	Digital Equinox (DEQ BC)	
Douglas Lighting Controls	WPC-5721	
Entertainment Technology	Tap Glide TG600FAM120 (120V)	
	Tap Glide Heatsink TGH1500FAM120 (120V)	
	Oasis 0A2000FAMU	
Honeywell	EL7315A1019	EL7305A1010 (optional)
	EL7315A1009	
HUNT Dimming	Preset slide: PS-010-IV and PS-010-WH	
	Preset slide: PS-010-3W-IV and PS-010-3W-WH	
	Preset slide, controls FD-010: PS-IFC-010-IV and PS-IFC-010-WH-120/277V	
	Preset slide, controls FD-010: PS-IFC-010-3W-IV and PS-IFC-010-3W-WH-120/277V	
	Remote mounted unit: FD-010	
Lehigh Electronic Products	Solitaire	PBX
PDM Electrical Products	WPC-5721	
Starfield Controls	TR61 with DALI interface port	RT03 DALInet Router
WattStopper®	LS-4 used with LCD-101 and LCD-103	

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a shaded background*
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

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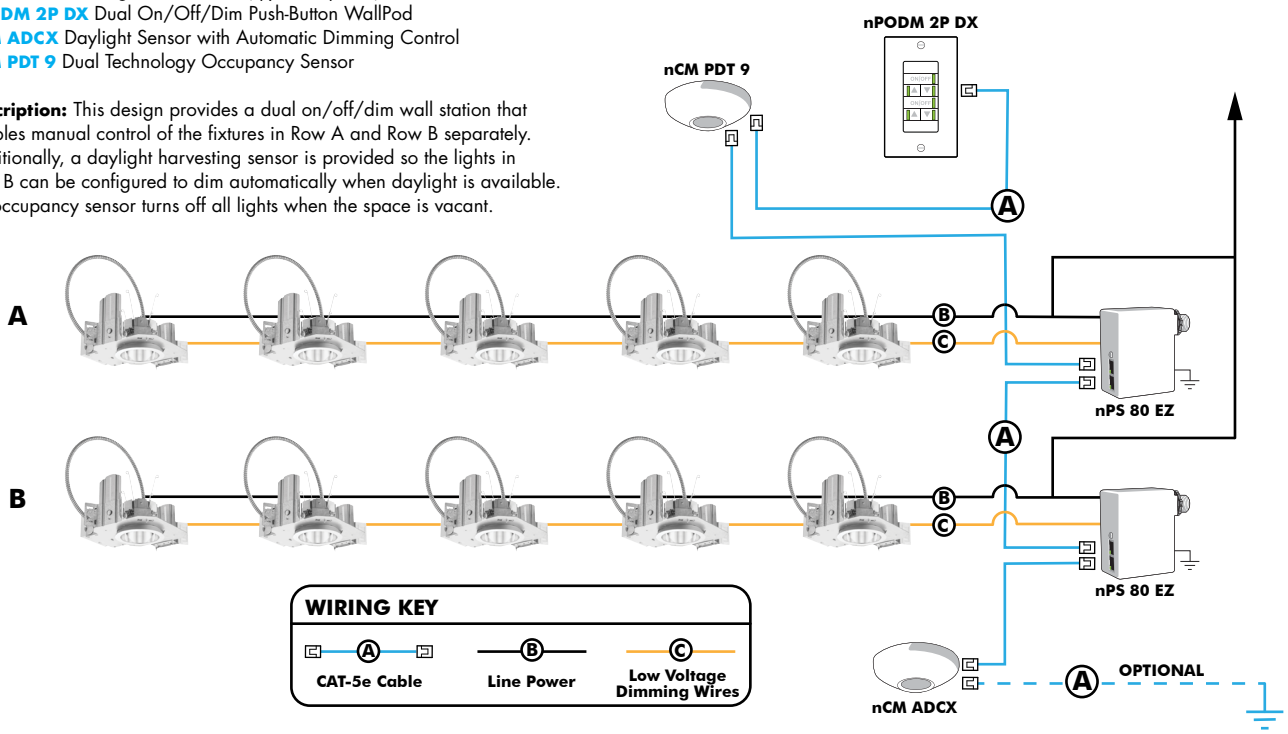
EXAMPLE
Group Fixture Control*
*Appiication diagram applies for fixtures with eldoLED drivers only.

nPS 80 EZ Dimming/Control Pack (qty: 2 required)
nPODM 2P DX Dual On/Off/Dim Push-Button WallPod
nCM ADCX Daylight Sensor with Automatic Dimming Control
nCM PDT 9 Dual Technology Occupancy Sensor

Description: This design provides a dual on/off/dim wall station that enables manual control of the fixtures in Row A and Row B separately. Additionally, a daylight harvesting sensor is provided so the lights in Row B can be configured to dim automatically when daylight is available. An occupancy sensor turns off all lights when the space is vacant.



Choose Wall Controls
nLight offers multiple styles of wall controls - each with varying features and user experience.



Push-Button Wallpod
Traditional tactile buttons and LED user feedback



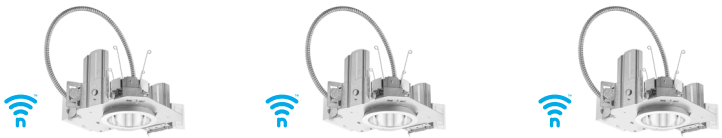
Graphic Wallpod
Full color touch screen provides a sophisticated look and feel

nLight® Wired Controls Accessories:			
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight for complete listing of nLight controls.			
WallPod Stations	**Model number**	**Occupancy sensors**	**Model Number**
On/Off	nPODM (Color)	Small motion 360º, ceiling (PIR/dual Tech)	nCM 9 / nCM PDT 9
On/Off & Raise/Lower	nPOD DX (Color)	Large motion 360º, ceiling (PIR/dual tech)	nCM 10 / nCM PDT 10
Graphic Touchscreen	nPOD GFX (Color)	Wide View (PIR/dual tech)	nWV 16 / nWV PDT 16
Photocell controls	**Model Number**	Wall Switch w/ Raise/Lower (PIR/dual tech)	nWSX LV DX / nWSX PDT LV DX
Dimming	nCM ADCX	**Cat-5 cables (plenum rated)**	**Model Number**
		10', CAT5 10FT	CAT5 10FT J1
		15, CAT5 15FT	CAT5 15FT J1

nLight® AIR Control Accessories: *Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair.*	
Wall switches	**Model number**
On/Off single pole	rPODB [color]
On/Off two pole	rPODB 2P [color]
On/Off & raise/lower single pole	rPODB DX [color]
On/Off & raise/lower two pole	rPODB 2P DX [color]
On/Off & raise/lower single pole	rPODBZ DX WH[1]

Notes
1 Can only be ordered with the RES7Z zone control sensor version.

nLight AIR
nLight AIR is the ideal solution for retrofit or new construction spaces where adding communication is cost prohibitive. The integrated nLight AIR rPP20 Power Pack is part of each Lithonia LDN Luminaire. These individually addressable controls offer the ultimate in flexibility during initial setup and for space repurposing.



Simple as 1,2,3

1. Install the nLight® AIR fixtures with embedded smart sensor
2. Install the wireless battery-powered wall switch
3. With CLAIRITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome



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JOB _____ TYPE _____

NOTES _____ APPROVALS _____

FEATURES

- 20" size in post top, pole and wall mount
- High performance optics up to 17,000 delivered lumens
- Elegant form factor
- Diffusion lens option
- SiteSync™ wireless control options

CERTIFICATIONS

c UL us LISTED

ida DARK SKY APPROVED 2016

DLC PREMIUM LISTED

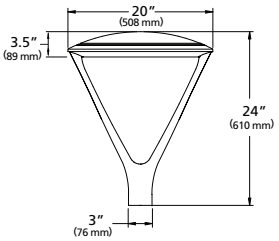
3000K and warmer CCTs only

SPECIFICATIONS



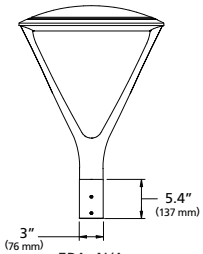
Weight: 35 lbs

FM33



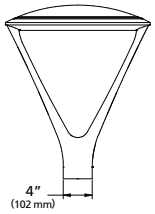
EPA: .512

PT23



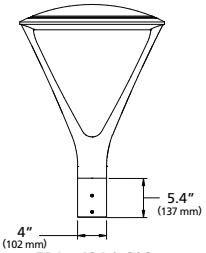
EPA: N/A

FM44



EPA: .534

PT24 / PT34



EPA: .424 / .608

ORDERING CODE

Series	LED Engine	CCT	Distribution	Rotation	Voltage	Mounting
UR20 Ouro	No Lens or Clear Lens	**AM** Amber	No Lens or Clear Lens	Blank for no rotation	**UNV** 120-277V	**FM33** Flush mt 3.0" OD pole, 3" fixture base
	24L-25 3,000 lm	**3K7** 3000K, 70 CRI	**FR** Type 1/Front Row	**L**[1] Optic rotation left	**347** 347V	**FM44** Flush mt 3.6" to 4.0" OD pole, 4" fixture base
	24L-65 7,000 lm	**3K8** 3000K, 80 CRI	**2** Type II	**R**[1] Optic rotation right	**480** 480V	**PT23** 3" Post Top mount for 2 3/8" OD Tenon
	56L-75 10,000 lm	**3K9** 3000K, 90 CRI	**3** Type III		**DALI** 120-277V†	**PT24** 4" Post Top mount for 2 3/8" OD Tenon
	56L-110 15,000 lm	**4K7** 4000K, 70 CRI	**4** Type IV		†Consult factory	**PT34** 4" Post Top mount for 2 7/8" OD Tenon
	56L-140 17,000 lm	**4K8** 4000K, 80 CRI	**4W** Type IV Wide			
	HDL - High Diffusion Lens	**5K7** 5000K, 70 CRI	**5QM** Type V Square Medium			
	28L-30 3,000 lm		**5QN** Type V Square Narrow			
	28L-70 7,000 lm		**5R** Type V Rectangular			
	68L-80 9,000 lm		**5W** Type V Wide (Round)			
	68L-115 13,000 lm		HDL - High Diffusion Lens			
	68L-150 15,000 lm		**3** Type III/Asymmetric			
			5W Type V/Symmetric			

Fixture Finish	Control Options		Options	Control Accessories^
BL Black	**7PR-TL** 7 pin PCR with twist lock photocontrol	**SWPM-40F**[2,3,4,5] SiteSync with Sensor 9' to 40' MH	**BC**[6] Back-light Control	**SW7PR**[2,3] SiteSync with 7 pin PCR
DB Dark Bronze	**7PR-SC** 7 pin PCR with shorting cap	**WSP-40F-1**[2,5] Dimming Occ. Sensor for up to 40' MH, 120/277/347V	**SF** Single Fuse	**SWUSB** SiteSync Software on USB
LG Light Gray	**7PR** 7 pin PCR, wireless control enabled	**WSP-40F-2**[2,5] Dimming Occ. Sensor for up to 40' MH, 208/240V	**DF** Double Fuse	**SWTAB** SiteSync Windows® Tablet
GT Graphite	**AD-01**[2] AstroDIM: 50% output at midnight	**WSP-40F-3**[2,5] Dimming Occ. Sensor for up to 40' MH, 480V	**TB** Terminal Block	**SWBRG** SiteSync Wireless Bridge Node
PS Platinum Silver	**AD-02**[2] AstroDIM: 50% output midnight to 4 AM	**NXSPW14F**[2,5] NX Wireless, PIR Sensor, 14'	**CLR**[5] Clear Lens	**WIR-RME-L** wiSCAPE External Fixture Module
TT Titanium	**AD-03**[2] AstroDIM: 50% output 10PM	**NXSPW30F**[2,5] NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'.	**TL** Tamper proof latch	**SCL-R** Occ. Sensor for Round Pole (up to 16' MH)
WH White	**AD-04**[2] AstroDIM: 50% output 10PM to 4AM	**NXSP14F**[2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14'		**SCL -S** Occ. Sensor for Square Pole (up to 16' MH)
CC Custom Color†	**NXWE** NX Wireless Enabled	**NXSP30F**[2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'		**SCH-R** Occ. Sensor for Round Pole (16' to 30' MH)
†Consult factory	**SWP**[2,3,4] SiteSync Pre commission			**SCH-S** Occ. Sensor for Square Pole (16' to 30' MH)
				NXOFM-1R1D-UNV NX 7-pin Module
				^ Please refer to page 8 for ordering details

1 Not available with 5QM, 5QN, and 5W distributions.
2 Not available with other sensor or wireless control options.
3 Specify group and zone at time of order. See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node.
4 Not available with 347V and 480V
5 24L & 56L only.
6 Not available with Type V distributions or HDL option.

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
24L	3,000	25	No Lens	FR	2932	0	0	1	115	3119	0	0	1	123	3098	0	0	1	124
				FR-BC	1994	0	0	0	78	2121	0	0	0	83	2107	0	0	0	83
				2	2943	1	0	1	116	3099	1	0	1	122	3110	1	0	1	124
				2-BC	1724	0	0	1	68	1834	0	0	1	72	1822	0	0	1	72
				3	3007	1	0	1	118	3200	1	0	1	126	3178	1	0	1	127
				3-BC	1830	0	0	1	73	1947	0	0	1	78	1934	0	0	1	77
				4	3056	0	0	1	120	3251	0	0	1	128	3229	0	0	1	129
				4-BC	2235	0	0	1	88	2377	0	0	1	93	2362	0	0	1	93
				4W	3078	1	0	2	121	3276	1	0	2	129	3253	1	0	2	130
				4W-BC	1855	0	0	1	73	1975	0	0	1	78	1961	0	0	1	77
				5QM	2931	2	0	1	115	3119	2	0	1	123	3098	2	0	1	124
				5QN	2694	2	0	1	106	2866	2	0	1	113	2847	2	0	1	114
				5R	3054	2	0	2	120	3250	2	0	2	128	3228	2	0	2	129
				5W	3043	2	0	1	120	3237	2	0	1	127	3216	2	0	1	129
			Clear Lens	FR	2773	0	0	1	109	2951	0	0	1	116	2930	0	0	1	117
				FR-BC	1886	0	0	1	74	2007	0	0	1	79	1993	0	0	1	78
				2	2784	1	0	1	109	2963	1	0	1	116	2942	1	0	1	118
				2-BC	1631	0	0	1	64	1736	0	0	1	68	1723	0	0	1	67
				3	2845	1	0	1	111	3028	1	0	1	119	3007	1	0	1	120
				3BC	1806	0	0	1	72	1922	0	0	1	77	1909	0	0	1	76
				4	2891	0	0	1	113	3076	0	0	1	120	3055	0	0	1	122
				4-BC	2114	0	0	1	83	2250	0	0	1	88	2234	0	0	1	88
				4W	2912	1	0	1	114	3099	1	0	2	121	3077	1	0	2	123
				4W-BC	1755	0	0	1	69	1868	0	0	1	73	1855	0	0	1	5
				5QM	2773	1	0	1	109	2950	2	0	1	116	2931	2	0	1	117
				5QN	2549	1	0	0	100	2712	2	0	1	106	2693	2	0	1	108
				5R	2890	2	0	2	113	3075	2	0	2	120	3054	2	0	2	122
				5W	2879	2	0	1	113	3064	2	0	1	120	3042	2	0	1	122
28L		30	HDL Lens	3	2816	1	0	1	96	2997	1	0	1	102	3020	1	0	1	101
				5W	2917	1	0	1	100	3105	1	0	1	106	3084	1	0	1	103

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
24L	7,000	65	No Lens	FR	6754	1	0	1	104	7187	1	0	1	111	7138	1	0	1	110
				FR-BC	4392	0	0	1	68	4673	0	0	1	72	4641	0	0	1	71
				2	6571	1	0	2	101	6992	1	0	2	108	6944	1	0	2	107
				2-BC	3799	0	0	1	58	4042	0	0	1	62	4014	0	0	1	62
				3	6625	1	0	2	102	7051	1	0	2	108	7002	1	0	2	108
				3BC	4032	0	0	1	62	4291	0	0	1	66	4261	0	0	1	66
				4	6788	1	0	2	104	7223	1	0	2	111	7174	1	0	2	110
				4-BC	4924	0	0	2	76	5239	0	0	2	81	5203	0	0	2	80
				4W	6699	1	0	2	103	7128	1	0	3	110	7079	1	0	3	109
				4W-BC	4088	0	0	2	63	4350	0	0	2	67	4321	0	0	2	66
				5QM	7025	3	0	1	108	7477	3	0	1	115	7425	3	0	1	114
				5QN	6964	3	0	1	107	7410	3	0	1	114	7323	3	0	1	113
				5R	7038	3	0	3	108	7489	3	0	3	115	7437	3	0	3	114
				5W	7011	3	0	2	108	7460	3	0	2	115	7409	3	0	2	114
			Clear Lens	FR	6432	1	0	1	97	6844	1	0	1	104	6798	1	0	1	105
				FR-BC	4182	0	0	1	63	4450	0	0	1	67	4420	0	0	1	67
				2	6258	1	0	1	95	6659	1	0	2	101	6613	1	0	2	102
				2-BC	3617	0	0	1	55	3849	0	0	1	58	3823	0	0	1	58
				3	6310	1	0	2	96	6714	1	0	2	102	6668	1	0	2	103
				3-BC	3599	0	0	1	55	3829	0	0	1	59	3803	0	0	1	59
				4	6465	1	0	2	98	6879	1	0	2	104	6832	1	0	2	105
				4-BC	4688	0	0	2	71	4990	0	0	2	76	4955	0	0	2	75
				4W	6380	1	0	2	97	6789	1	0	2	103	6742	1	0	2	104
				4W-BC	3893	0	0	2	59	4143	0	0	2	63	4115	0	0	2	62
				5QM	6691	3	0	1	101	7119	3	0	1	108	7070	3	0	1	109
				5QN	6632	2	0	1	100	7058	3	0	1	107	7009	3	0	1	108
				5R	6702	3	0	3	102	7131	3	0	3	108	7082	3	0	3	109
				5W	6676	3	0	2	101	7104	3	0	2	108	7055	3	0	2	109
28L		70	HDL Lens	3	6047	2	0	2	92	6047	2	0	2	92	6236	2	0	2	89
				5W	6221	2	0	1	94	6619	2	0	1	100	6525	2	0	1	93

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	10,000	75	No Lens	FR	9315	1	0	1	124	9913	1	0	1	132	9845	1	0	1	131
				FR-BC	6058	0	0	1	81	6445	0	0	1	86	6402	0	0	1	85
				2	9063	2	0	2	120	9644	2	0	2	128	9578	2	0	2	128
				2-BC	5239	0	0	1	70	5575	0	0	1	74	5536	0	0	1	74
				3	9139	2	0	2	125	9725	2	0	2	134	9657	2	0	2	129
				3-BC	5561	0	0	2	74	5877	0	0	2	78	5561	0	0	2	74
				4	9362	1	0	2	124	9362	1	0	2	124	9876	1	0	2	132
				4-BC	6791	0	0	2	90	7226	0	0	2	96	7168	0	0	2	96
				4W	9240	2	0	3	123	9832	2	0	3	131	9765	2	0	3	130
				4W-BC	5639	0	0	2	75	6001	0	0	2	80	5959	0	0	2	79
				5QM	9691	3	0	1	129	10312	3	0	1	137	10240	3	0	1	137
				5QN	9606	3	0	1	128	10222	3	0	1	136	10151	3	0	1	135
				5R	9706	3	0	3	129	10328	3	0	3	137	10258	3	0	3	137
				5W	9669	4	0	2	129	10289	4	0	2	137	10217	4	0	2	136
			Clear Lens	FR	8871	1	0	1	117	9760	1	0	1	129	9374	1	0	1	125
				FR-BC	5769	0	0	1	76	6138	0	0	1	81	6096	0	0	1	81
				2	8631	2	0	2	114	9183	2	0	2	121	9121	2	0	2	122
				2-BC	4989	0	0	1	67	5309	0	0	1	71	5272	0	0	1	62
				3	8703	1	0	2	115	9260	2	0	2	122	9197	2	0	2	123
				3-BC	4964	1	0	1	66	5282	1	0	2	70	5245	1	0	2	69
				4	8916	1	0	2	118	9487	1	0	2	125	9423	1	0	2	126
				4-BC	6467	0	0	2	85	6881	0	0	2	91	6834	0	0	2	90
				4W	8799	2	0	3	116	9363	2	0	3	124	9300	2	0	3	124
				4W-BC	5370	0	0	2	72	5714	1	0	2	76	5675	0	0	2	76
				5QM	9228	3	0	1	122	9820	3	0	1	130	9752	3	0	1	130
				5QN	9147	3	0	1	121	9734	3	0	1	129	9668	3	0	1	129
				5R	9244	3	0	3	122	9836	3	0	3	130	9769	3	0	3	130
				5W	9208	4	0	2	122	9798	4	0	2	130	9732	4	0	2	130
68L		80	HD Lens	3	7853	2	0	2	99	8356	2	0	2	106	8299	2	0	2	104
				5W	8080	2	0	2	102	8684	3	0	2	110	8684	3	0	2	109

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	15,000	110	No Lens	FR	13533	1	0	1	125	14399	1	0	2	133	14301	1	0	2	130
				FR-BC	8799	1	0	1	81	9363	1	0	1	86	9300	1	0	1	85
				2	13165	2	0	2	121	14009	2	0	2	129	13913	2	0	2	126
				2-BC	7611	1	0	2	70	8098	1	0	2	75	8042	1	0	2	74
				3	13275	2	0	3	122	14126	2	0	3	130	14030	2	0	3	128
				3-BC	8079	1	0	2	73	8596	1	0	2	78	8538	1	0	2	78
				4	13601	1	0	3	125	14472	1	0	3	133	14373	1	0	3	131
				4-BC	9865	1	0	2	91	10497	1	0	3	97	10425	1	0	3	96
				4W	13422	2	0	3	124	14283	2	0	3	132	14185	2	0	3	129
				4W-BC	8191	1	0	3	75	8715	1	0	3	80	8656	1	0	3	80
				5QM	14077	4	0	2	130	14979	4	0	2	138	14876	4	0	2	135
				5QN	13953	4	0	1	129	14848	4	0	1	137	14747	4	0	1	134
				5R	14100	4	0	4	130	15004	4	0	4	138	14901	4	0	4	135
				5W	14046	4	0	2	129	14946	4	0	2	138	14844	4	0	3	135
			Clear Lens	FR	12803	1	0	1	118	13624	1	0	1	126	13531	1	0	1	123
				FR-BC	9298	1	0	1	86	8325	1	0	1	77	8798	1	0	1	81
				2	12455	2	0	2	115	13254	2	0	2	123	13164	2	0	2	120
				2-BC	7200	1	0	1	67	7661	1	0	2	71	7610	1	0	2	70
				3	12560	2	0	3	116	13365	2	0	3	124	13273	2	0	3	121
				3-BC	7163	1	0	2	65	7622	1	0	2	69	7570	1	0	2	69
				4	12868	1	0	3	119	13692	1	0	3	127	13599	1	0	3	124
				4-BC	9333	1	0	2	86	9931	1	0	2	92	9864	1	0	2	90
				4W	12699	2	0	3	117	13513	2	0	3	125	13420	2	0	3	122
				4W-BC	7750	1	0	3	72	8246	1	0	3	76	8190	1	0	3	76
				5QM	13318	3	0	2	123	14172	4	0	2	131	14075	4	0	2	128
				5QN	13202	3	0	1	122	14048	4	0	1	130	13951	4	0	1	127
				5R	13341	4	0	4	123	14195	4	0	4	131	14099	4	0	4	128
				5W	13290	4	0	2	123	14141	4	0	2	131	14044	4	0	2	128
68L		115	HD Lens	3	11577	2	0	2	102	12320	2	0	2	109	12236	2	0	2	106
				5W	11912	3	0	2	105	12676	3	0	2	112	12588	3	0	2	109

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	17,000	140	No Lens	FR	15323	2	0	2	111	16306	2	0	2	118	16194	2	0	2	116
				FR-BC	9964	1	0	1	72	10603	1	0	1	77	10530	1	0	1	76
				2	14897	2	0	2	108	15852	2	0	2	115	15743	2	0	2	112
				2-BC	8618	1	0	2	63	9169	1	0	2	67	9107	1	0	2	66
				3	15032	2	0	3	109	15996	2	0	3	116	15886	2	0	3	113
				3-BC	9147	1	0	2	65	9733	1	0	2	70	9667	1	0	2	69
				4	15400	1	0	3	112	16387	1	0	4	119	16275	1	0	4	116
				4-BC	11170	1	0	3	81	11886	1	0	3	86	11804	1	0	3	86
				4W	15198	2	0	4	110	16173	3	0	4	117	16062	3	0	4	115
				4W-BC	9275	1	0	3	67	9869	1	0	3	72	9801	1	0	3	71
				5QM	15939	4	0	2	116	16962	4	0	2	123	16845	4	0	2	120
				5QN	15801	4	0	1	115	16813	4	0	1	122	16698	4	0	1	119
				5R	15966	4	0	4	116	16990	4	0	4	123	16874	4	0	4	121
				5W	15906	4	0	3	115	16925	4	0	3	123	16808	4	0	3	120
			Clear Lens	FR	14541	1	0	2	105	15473	2	0	2	111	15367	2	0	2	110
				FR-BC	9456	1	0	1	68	10061	1	0	1	72	9993	1	0	1	72
				2	14146	2	0	2	102	15053	2	0	2	108	14950	2	0	2	107
				2-BC	8178	1	0	2	59	8702	1	0	2	63	8642	1	0	2	62
				3	14265	2	0	3	103	15179	2	0	3	109	15076	2	0	3	108
				3BC	8136	1	0	2	58	8657	1	0	2	62	8598	1	0	2	61
				4	14614	1	0	3	105	15551	1	0	3	112	15445	1	0	3	110
				4-BC	10600	1	0	3	76	11279	1	0	3	81	11203	1	0	3	81
				4W	14423	2	0	3	104	15347	2	0	4	111	15243	2	0	4	109
				4W-BC	8802	1	0	3	63	9365	1	0	3	67	9302	1	0	3	67
				5QM	15126	4	0	2	109	16095	4	0	2	116	15985	4	0	2	114
				5QN	14994	4	0	1	108	15955	4	0	1	115	15846	4	0	1	113
				5R	15152	4	0	4	109	16122	4	0	4	116	16012	4	0	4	114
				5W	15094	4	0	3	109	16061	4	0	3	116	15951	4	0	3	114
68L		115	HD Lens	3	13240	2	0	2	89	13992	3	0	3	95	13897	3	0	3	93
				5W	13623	3	0	2	92	14396	3	0	2	97	14298	3	0	2	95

Electrical Characteristics												Dimming				
System Watts	Drive Current	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming Range	Source current out		Absolute voltage	
		VAC	Hz	120	208	240	277	347	480				Min	Max	Min	Max
25	298mA	120-480	50/60	0.21	0.12	0.10	0.09	0.07	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
30	298mA			0.25	0.14	0.13	0.11	0.09	0.06							
65	800mA			0.54	0.31	0.27	0.23	0.19	0.14							
70	700mA			0.58	0.34	0.29	0.25	0.20	0.15							
75	420mA			0.63	0.36	0.31	0.27	0.22	0.16							
80	350mA			0.67	0.38	0.33	0.29	0.23	0.17							
110	600mA			0.92	0.53	0.46	0.40	0.32	0.23							
115	500mA			0.96	0.55	0.48	0.42	0.33	0.24							
140	750mA			1.17	0.67	0.58	0.51	0.40	0.29							
150	625mA			1.25	0.72	0.63	0.54	0.43	0.31							

TM-21 LIFETIME CALCULATION

Projected Lumen Maintenance (25°C / 77°F)						
HOURS	0	25,000	36,000	50,000	100,000	Reported L70
Projected Lumen Maintenance	100%	97%	95%	93%	87%	> 60,000 hrs

Kim Lighting reserves the right to change specifications without notice.

SPECIFICATIONS

Housing:

- Low copper aluminum alloy die-casting is designed as one-piece with internal cooling fins.
- Solid, cast aluminum wall creates a thermal barrier between the optical and electrical compartments.
- Molded silicone gasket throughout insures the sealing between the two compartments and provides ingress protection.
- Housing is designed with integral LED heat sink utilized for thermal transfer and for securing the location of each LED module.
- IK09 rated enclosure protects electrical equipment against external mechanical impacts.

Lens Frame:

- One-piece low copper aluminum alloy die-cast is secured to housing with 6 screws.

Backlight Control

- Optional Backlight Control on each LED module to completely control unwanted backlight.

Lens

One-piece flat glass lens slips secure with clips. Extra silicone gasketing is provided to retain a clear optical compartment.

Optical Module:

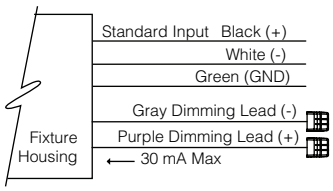
- LEDs shall be mounted to a metal printed circuit board assembly (MCPCB).
- Optical lenses shall be clear injection molded PMMA acrylic.
- Each MCPCB and optic shall be sealed to the diecast housing and sealed with a continuous one piece injection molded silicone rubber gasket.
- Patent Pending design of optical array shall independently shield each LED optic across the length of the aperture.
- Optional fixture finish optical surfaces shall not exceed BUG ratings of the standard white finish and shall be greater than or equal to the delivered lumens of the optional matte black optical surface finish.

Electrical Components

- Standard programmable driver allows for programmable drive current settings.
- Electrical components are stategically located in the driver gear compartment with a molded silicon grommet seal to provide separation from the optical chamber.
- Maximum lightning surge current 20KA with thermally protected varistor technology. Surge suppression is series circuited preventing total fixture failure. ANSI/IEEE C62.41 Category C High.
- Open circuit fault will turn off the luminaire in order to protect the sensitive electronics and acts as a signal for maintenance.
- Programmable Driver is rated for -40°C starting.
- "Thermal Shield", primary side, thermister provides protection for the sustainable life of electronic components.

Dimming:

- Dimming range from 100% to 10% through the use of the standard 0-10V interface on the programmable driver.
- Modular wiring harness in the service area provides user access to the dimming circuitry.
- Dimming circuitry compatible with 0-10V, user-defined control devices.
- Optional factory programmed dimming profile.



Fusing:

SF for 120, 277, and 347 Line volts

DF for 208, 240, and 480 Line volts

Hight temperature fuse holders factory installed inside the fixture housing.

Fuse is included.

Finish:

Fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat.

Standard colors include (BLS) Black Gloss Smooth, (BLT) Black Matte Textured, (DBS) Dark Bronze Smooth, (GTT) Graphite Matte Textured, (LGS) Light Gray Smooth, (PSS) Platinum Silver Smooth, (VGS) Verde Green Smooth, (WHS) White Gloss Smooth, and (CC) Custom Color (Include RAL#).

Certifications and Listings:

- IUL 1598 Standard for Luminaires.
- IUL 8750 Standard for Safety for Light
- IEmitting Diode (LED) Equipment for use in Lighting Products.
- ICSA C22.2#250.0 Luminaires.
- ANSI C136.31-2010 Vibration tested and compliant 1.5G and 4G reference page 9
- IRoHS compliant.
- IIP66 rated.
- IIEC 66262 Mechanical Impact Code IK09.
- IDA approved, 3000K and warmer CCTs only.

CAUTION:

Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

WARRANTY:

For full warranty see: http://www.hubbelllighting.com/resources/warranty

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CONTROLS

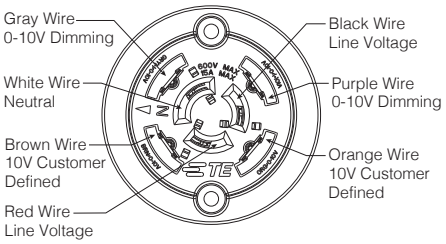
Photocell Receptacle

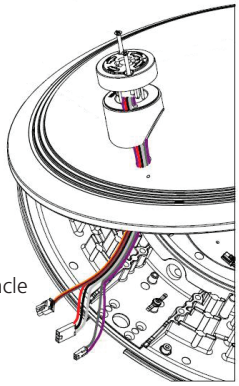
7PR

Fully gasketed and wired 7-pin receptacle option. Easy access location above the electrical compartment. 7-pin construction allows for a user-defined interface and provides a controlled definition of operational performance. ANSI twist-lock control module by-others.

Standard customer operation modes:

1. Traditional on/off photoelectric control.
2. 5-pin wireless photoelectric control for added dimming feature.
3. 7-pin wireless photoelectric control for dimming and additional I/O connections for customer use.





7-Pin receptacle placement

Wireless Controls

wiSCAPE™

Hubbell Control Solution's wiSCAPE™ wireless control modules allow an individual fixture to managed, monitored and measured. The modules communicate securely over a robust certified meshed radio signal. The wiSCAPE modules provide on/off/dim control, external device input, alerts and metering.

WIR-RME-L

wiSCAPE External Module,120-480V, 1000ft range (LOS), Internal Photocell, 1 Digital Input, Compatible with the A-25-7H option

SiteSync™[1]

SiteSync™ wireless control system for reduction in energy and maintenance cost while optimizing light quality 24/7. See ordering information or visit www.hubbelllighting.com/products/sitesync for more details.

Dimming WASP Occupancy Sensor

WSP

The Dimming WASP Outdoor Occupancy Sensor is specifically designed to provide 0-10VDC output for the control of dimmable fixtures. Easy to use dipswitches allow the user to adjust sensor time delay and sensitivity as well as set unoccupied and occupied dimming levels. Sensors also feature a daylight sensor for ON/OFF control of fixtures when there is sufficient natural light. Visit https://hubbellcdn.com/installationmanuals/2102B_Dimming_WASP_Install.pdf for more details.

Pole Mounted

Round Pole-Mounted Occupancy Sensor up to 16'. Select voltage and finish color.

SCL-R

Round Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCL-R44/277[2]/BL[3]

Square Pole-Mounted Occupancy Sensor up to 16'. Select voltage and finish color.

SCL-S

Square Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for square pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCL-L/277[2]/BL[3]

Round Pole-Mounted Occupancy Sensor 16' to 30'. Select voltage and finish color.

SCH-R

Round Pole-Mounted Occupancy Sensor: 16' to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCH-R4[4]/277[2]/BL[3]

Square Pole-Mounted Occupancy Sensor 16' to 30'. Select voltage and finish color.

SCH-S

Square Pole-Mounted Occupancy Sensor: 16 to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCH-S/277[2]/BL[3]

AstroDIM

AstroDIM provides multi-stage night-time power reduction based on an internal timer referenced to the power on/off time. There is no need for an external control infrastructure. The unit automatically performs a dimming profile based on the predefined scheduled reference to the midpoint, which is calculated based on the power on/off times.

[1]PRECOMMISSIONED SITESYNC ORDERING INFORMATION: When ordering a fixture with the SiteSync lighting control option, additional information will be required to complete the order. The SiteSync Commissioning Form or alternate schedule information must be completed. This form includes Project location, Group information, and Operating schedules. For more detailed information please visit www.HubbellLighting.com/products/sitesync or contact Hubbell Lighting tech support at (800) 345-4928.

SiteSync fixtures with occupancy sensor (SWPM) require the mounting height of the fixture for selection of the lens.

Examples:

SiteSync only : UR20/56L-75/3K7/UNV/ASQ/BL/SWP

SiteSync with Motion Control: UR20/56L-75/3K7/UNV/ASQ/BL/SWPM-40F

[2]Voltage, [3]Color, [4]Pole Diameter,

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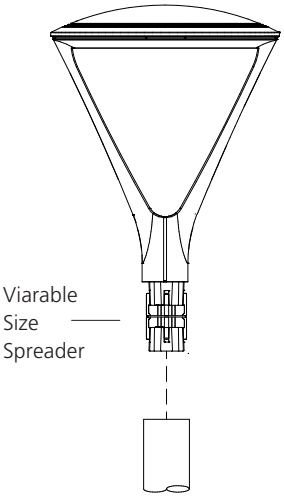
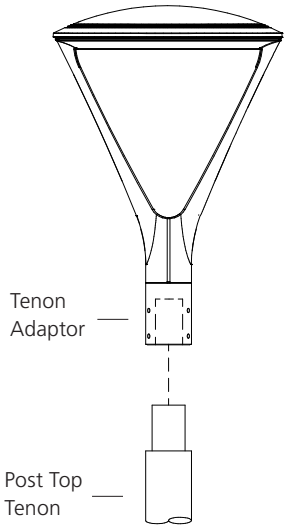
MOUNTING INSTALLATION

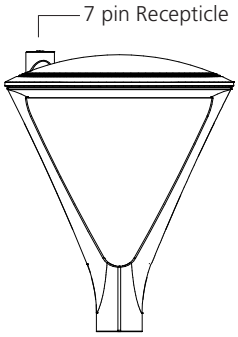


Flush Mount
FM33/44

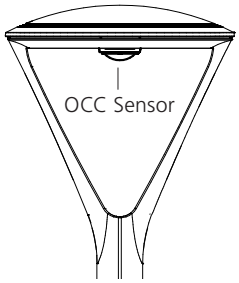


Post Top
PT23/24/34

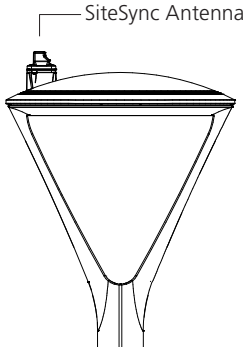
SENSOR PLACEMENT



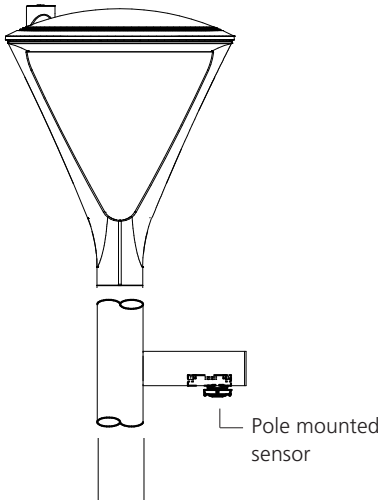
7 pin PCR
7PR



OCC Sensor
NX or WSP



SiteSync
SW7PR



Pole Mounted Sensor
SCL-R, SCL-S, SCH-R,
SCH-S

MOUNTING VIBRATION RATINGS

UR 20 Arm		UR28 Arm		UR 20 Post Top		UR 28 Post Top	
Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating
ASQ	4G	**ASQ**	4G	**FM33**	4G	**FM44**	1.5G
A34	4G	**A34**	4G	**FM44**	1.5G	**FM45**	1.5G
A46	4G	**A46**	4G	**PT23**	4G	**PT24**	1.5G
MAF	4G	**MAF**	4G	**PT24**	4G	**PT34**	1.5G
				PT34	1.5G	**PT25**	1.5G
						PT35	1.5G

For the 4 G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Test Level 1 Normal Applications, Vibration Test Level 2 Bridge/Overpass Applications, and Vibration Test Level 3

For the 1.5G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Level 1 Bridge/Overpass Applications

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DESCRIPTION

The Invue Arbor post top brings architectural style to area/site and pedestrian scale applications. Its dayform appearance brings a desired organic look into the urban environment. WaveStream™ LED Optics provide a uniform pixelation free image, managing glare while providing high levels of visibility.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Two-piece IP66 rated housing is cast from low copper content corrosion resistant aluminum, maintaining strength and precision to sustain long term dayform appearance. ANSI C136.31 testing compliance prevents damage from installation generated vibration. External hardware and casting seams are minimized to enhance appearance.

Optics
Specifically designed for pedestrian applications, WaveStream LED optical waveguide technology produces both symmetric NEMA type V and asymmetric NEMA II, III, IV distributions. The waveguide is manufactured from precision injection molded acrylic resulting in a pixelation free optical image for improved glare control and visual comfort. Luminaire efficacy's measure up to 100 lm/w for 4000K (+/- 275K) CCT at 70 CRI (min), optional 3000K CCT at 80 CRI is also available.

Electrical
LED driver(s) are directly mounted to upper housing thermal pad for optimal thermal performance. Standard 0-10V dimming drivers and Eaton's proprietary surge protection module are designed to withstand 10kV of transient line surge. Drivers operate at 120-277V 50/60Hz with 347V/60Hz or 480V/60Hz operation optional. Suitable for ambient temperature applications as low as -40°C (40°F) to 40°C (104°F). Limited high ambient options allow for 50°C operation.

Controls
The Arbor LED luminaire control options are designed to be simple and cost-effective ASHRAE and California Title 24 compliant solutions. The ANSI C136.41 compliant NEMA 7-PIN receptacle enables wireless dimming when used with compatible photocontrol. An integrated dimming and occupancy sensor is a standalone control option available in on/off (MS) and bi-level dimming (MS/DIM) operation. The optional LumaWatt Pro™ system is best described as a peer-to-peer wireless network of luminaire-integral sensors that operate in accordance with programmable profiles. Each sensor is capable of motion and photo sensing, metering power consumption and wireless communication. See control options page for more details.

Mounting
Fitter assembly mounts over 2-3/8" O.D. tenon and is secured via six concealed stainless steel set screws. Design of fitter provides seamless transition to 3" O.D. round pole top. Additional mounting accessories include a single fixture arm mount, twin fixture arm mount and wall mount arm. Additional pole mount accessories mount to a 3" x 4" long tenon for 4" - 5" O.D. poles tops. For existing 2-3/8" tenons an adapter is shipped standard.

Finish
Eaton utilizes premium ultra-weatherable TGIC based polyester powder coatings that are specifically formulated to withstand extended outdoor exposure. The powders are formulated exclusively for Eaton to serve functionally as well as decorative. Good film appearance combinded with excellent mechanical an exterior exposure qualities display greater than twice as much gloss retention. RAL and custom color matches available. Finish is compliant with ASTM B117 3000hr salt spray standard.

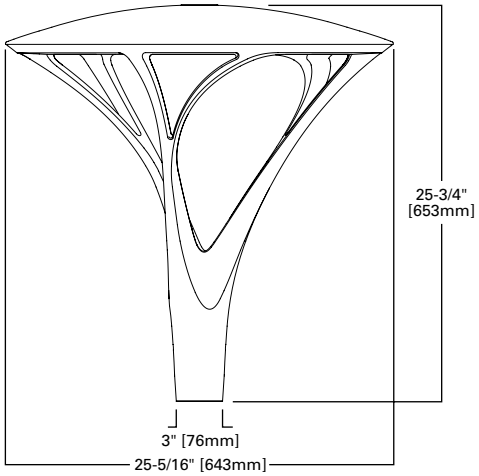
Warranty
Five-year warranty.



ARB ARBOR POSTTOP

DECORATIVE LUMINAIRE

DIMENSIONS



CERTIFICATION DATA

UL/cUL Listed
ANSI C136.31 1.5G Vibration Tested
IEG 60529 IP66 Housing
ASTM B117 SaH Spray Tested
ASTM A3560 Low Cooper Alloy
RoHS
ISO 9001
Dark Sky Approved (3000K CCT and warmer only)

ENERGY DATA

Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V 50/60Hz, 347V/60Hz, 480V/60Hz
40°C Ambient Temperature Rating
As low as -40°C (-40°F) minimum temperature
*See MINIMUM TEMPERATURE table

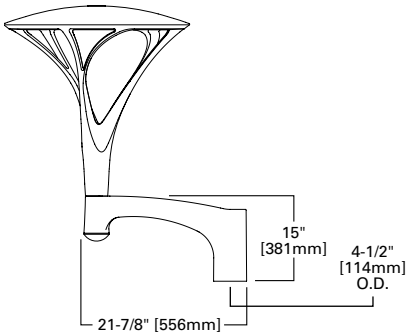
EPA

Effective Projected Area: (Sq. Ft.) 0.9

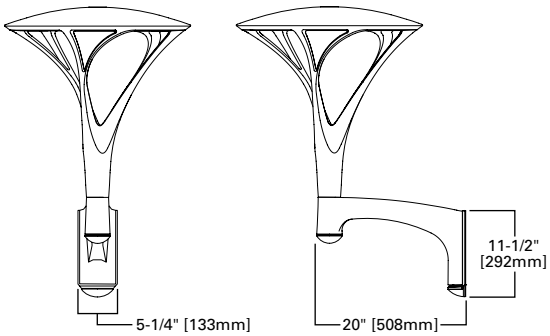
Approximate Net Weight:
37 lbs. [16.8 kgs.]

MOUNTING CONFIGURATIONS (WEIGHT AND EPAS INCLUDES FIXTURE)

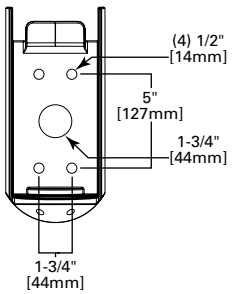
Single Arm Mount (ARSA-XX)
Weight: 56 lbs. [25.45 kgs.]
EPA: 1.7 Sq. Ft.



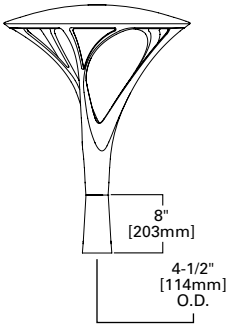
Wall Mount Arm (ARWM-XX)
Weight: 57 lbs. [25.91 kgs.]
EPA: 1.8 Sq. Ft.



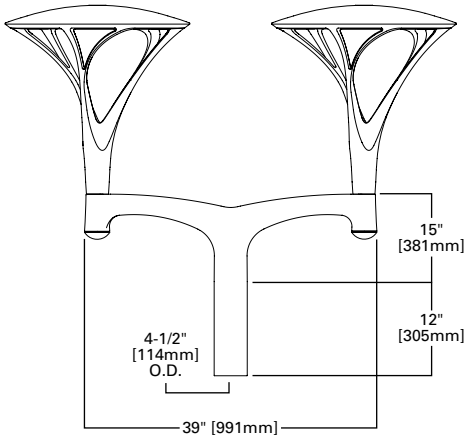
Wall Mount Arm Drill Pattern



Post Top Adapter (ARPA4-XX)
Weight: 41 lbs. [18.63 kgs.]
EPA: 1.2 Sq. Ft.



Twin Arm Mount (ARTA15-XX)
Weight: 114 lbs. [51.81 kgs.]
EPA: 3.45 Sq. Ft.

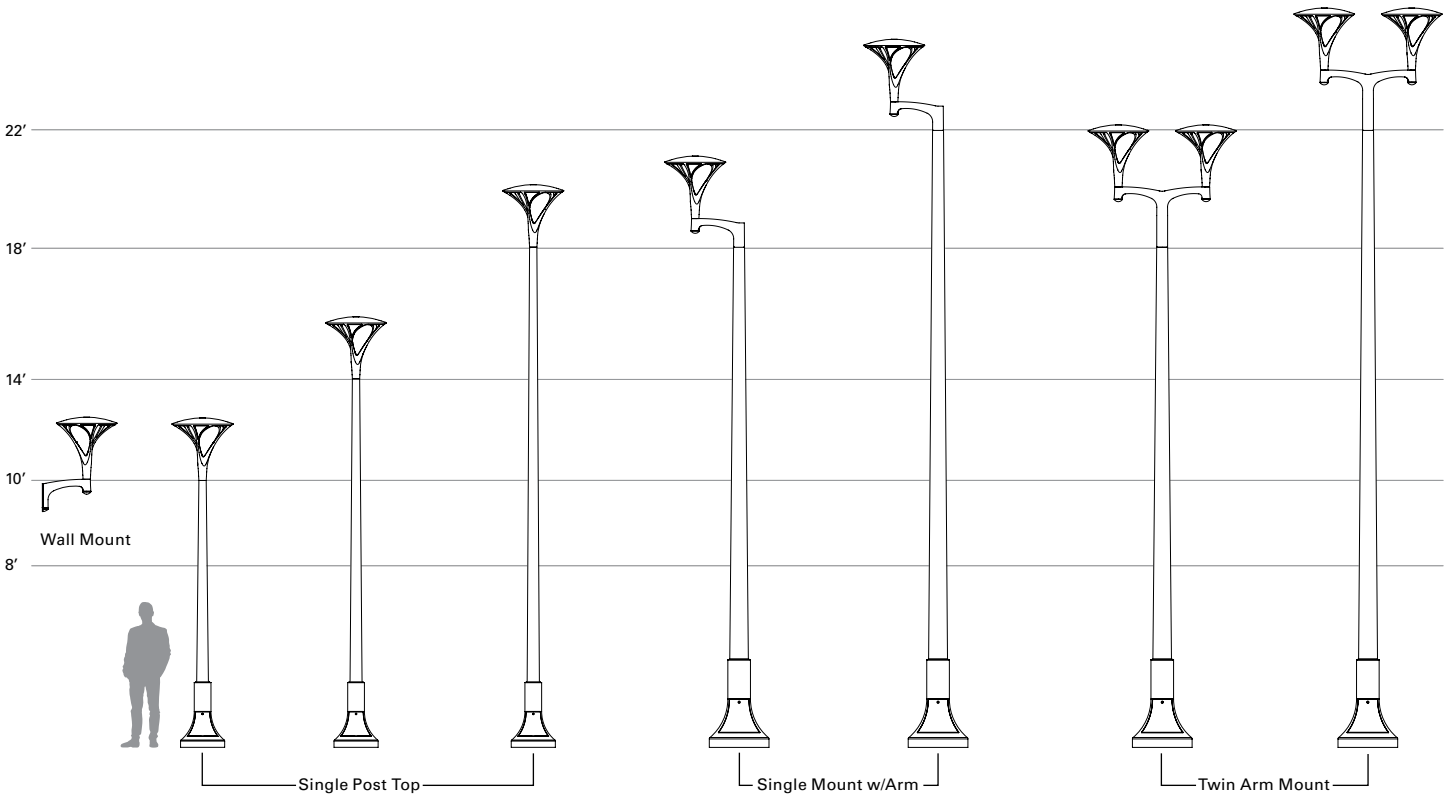


MOUNTING REQUIREMENTS CHART

Tenon O.D. (Inches)	**2-3/8" Tenon**		
Pole Top O.D. (Inches)	**3"**	**4"**	**5"**
Post Top	Standard	Spacer (Provided) & ARPA4-XX (Order Separately)	Spacer (Provided) & ARPA4-XX (Order Separately)
Single Arm Mount	Spacer (Provided)	Spacer (Provided)	Spacer (Provided)

Tenon O.D. (Inches)	**3" Tenon**		
Pole Top O.D. (Inches)		**4"**	**5"**
Post Top		ARPA4-XX (Order Separately)	ARPA4-XX (Order Separately)
Single Arm Mount		Standard	Standard
Twin Mount		Standard	Standard

POLE CONFIGURATIONS (ARP DECORATIVE POLE SHOWN)



CONTROL OPTIONS

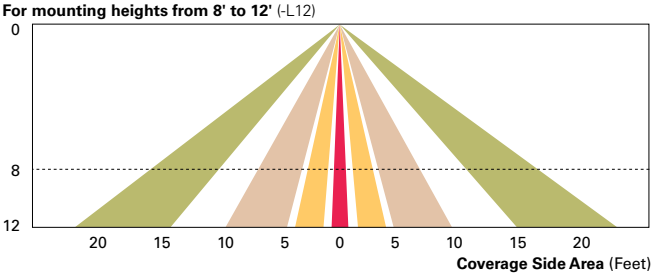
0-10V (D) The dimming option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (PER and PER7) Photocontrol receptacles provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

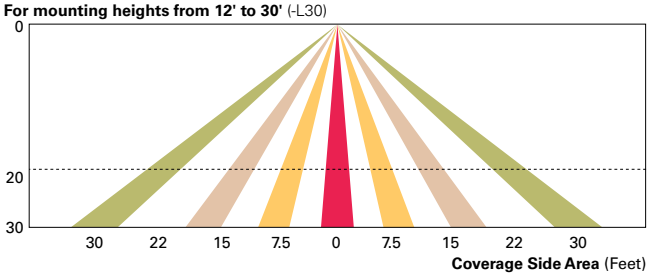
Dimming Occupancy Sensor (MS) These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (/DIM) option is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output. When a sensor for ON/OFF operation is selected, the luminaire will turn off after five minutes of no activity.

These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". Note: For MS sensors, the factory preset is OFF (Disabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 8'-40'.

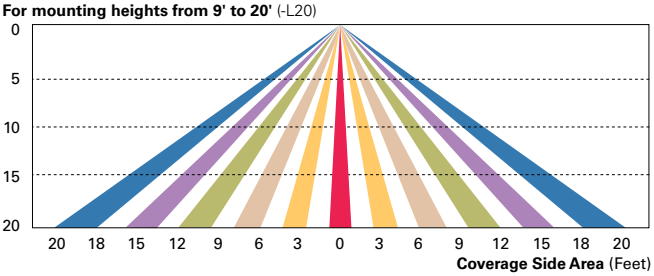
For mounting heights from 8' to 12' (-L12)



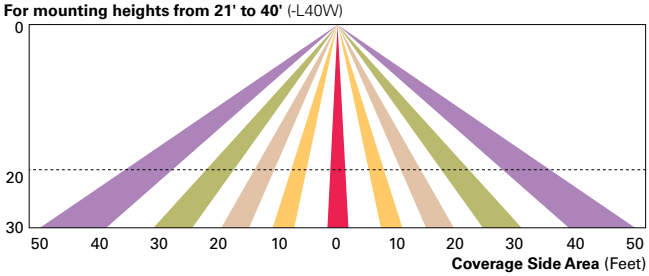
For mounting heights from 12' to 30' (-L30)



For mounting heights from 9' to 20' (-L20)



For mounting heights from 21' to 40' (-L40W)

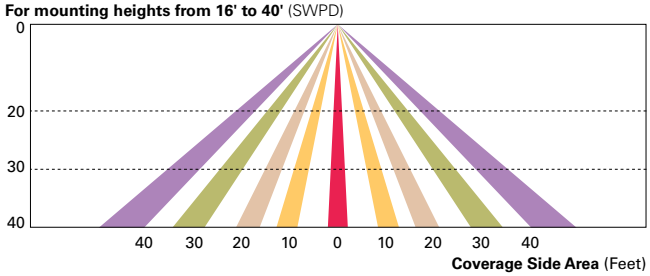


WaveLinx Wireless Control and Monitoring System Available in 7-PIN or 4-PIN configurations, the WaveLinx Outdoor control platform operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. Use the WaveLinx Mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets).

WaveLinx Outdoor Control Module (WOLC-7P-10A) A photocontrol that enables astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.

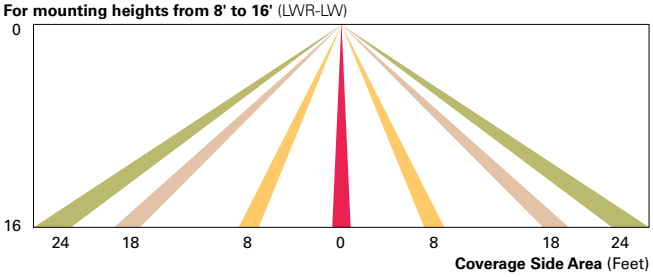
WaveLinx Wireless Sensor (SWPD4 and SWPD5) These outdoor sensors offer passive infrared (PIR) occupancy and a photocell for closed loop daylight sensing. These sensors can be factory installed or field-installed via simple, tool-less integration into luminaires equipped with the Zhaga Book 18 compliant 4-PIN receptacle (ZW). These sensors are factory preset to dim down to approximately 50 percent power after 15 minutes of no activity detected. These occupancy sensors include an integral photocell for "dusk-to-dawn" control or daylight harvesting that is factory-enabled. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 7'-40'.

For mounting heights from 16' to 40' (SWPD)

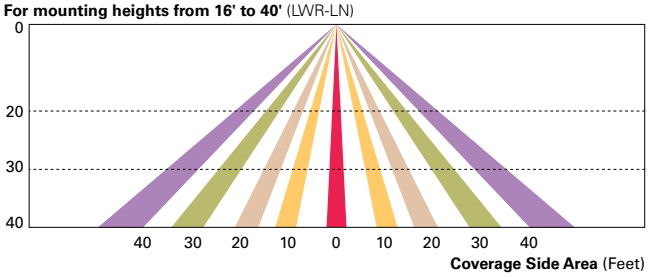


LumaWatt Pro Wireless Control and Monitoring System (LWR-LW and LWR-LN) The Eaton's LumaWatt Pro powered by Enlighted is a connected lighting solution that combines LED luminaires with an integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of other resources beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)



For mounting heights from 16' to 40' (LWR-LN)



POWER AND LUMENS

Lumen Package		B1	B2	B3	B4
Drive Current					
Power Wattage (Watts)		24W	48W	96W	99W
Input Current (mA) @ 120V		200	400	800	830
Input Current (mA) @ 208V		120	240	470	480
Input Current (mA) @ 240V		100	200	400	420
Input Current (mA) @ 277V		90	180	350	360
Power Wattage (Watts)		26W	53W	107W	108W
Input Current (mA) @ 347V		79	161	325	328
Input Current (mA) @ 480V		58	117	235	237
Optics					
Type II	Lumens	2,045	3,994	7,362	--
	BUG Rating	B1-U1-G1	B1-U2-G2	B3-U2-G3	--
Type III	Lumens	2,324	4,534	8,451	--
	BUG Rating	B1-U1-G1	B1-U2-G2	B2-U2-G3	--
Type IV	Lumens	2,408	4,691	8,740	--
	BUG Rating	B1-U1-G1	B1-U2-G2	B2-U2-G3	--
Type V	Lumens	2,311	4,529	8,511	9,464
	BUG Rating	B2-U1-G1	B3-U2-G2	B3-U2-G3	B3-U2-G3

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (60,000 Hours)	Calculated L70 (Hours)
25°C	>91%	>230,000
40°C	>88%	>172,000
50°C	>86%	>142,000

NOTE: Maintenance data applies to the highest drive current and represents the worst case at the highest wattage.

COLOR TEMPERATURE

Color Temperature (CCT)	CRI (Nominal)	Multiplier
4000	70	1.00
3000	80	0.91

MINIMUM AMBIENT TEMPERATURE

Lumen Package	Temperature
B1	-40°C
B2	-35°C
B3	-35°C
B4	-40°C
All DALI powered lumen packages	-20°C

ORDERING INFORMATION

Sample Number: ARB-B2-LED-D1-T2-GM

Product Family [1, 2]	Lumens [3]	Lamp Type	Voltage	Distribution	Color
ARB=Arbor Post Top	**B1**=Nominal 2,300 Lumens **B2**=Nominal 4,500 Lumens **B3**=Nominal 8,500 Lumens **B4**=Nominal 9,500 Lumens [4]	**LED**=Solid State Light Emitting Diodes	**D1**=Dimming Driver (120-277V) **347**=347V [5] **480**=480V [5, 6]	**T2**=Type II **T3**=Type III **T4**=Type IV **T5**=Type V	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **CC**=Custom Color [7]

Options (Add as Suffix)

7030=70 CRI / 3000K CCT [8]
8030=80 CRI / 3000K CCT [8]
PC=Button Type Photocontrol
PER=NEMA 3-PIN Twistlock Photocontrol Receptacle
PER7=NEMA 7-PIN Twistlock Photocontrol Receptacle
HA=50°C High Ambient Temperature [9]
MS-L08=Photo/Motion Sensor for ON/OFF Operation, Maximum 8' Mounting Height [10, 11]
MS-L20= Photo/Motion Sensor for ON/OFF Operation, 9' - 20' Mounting Height [10, 11]
MS-L40W=Photo/Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height [10, 11]
MS/DIM-L08=Photo/Motion Sensor for Dimming Operation, Maximum 8' Mounting Height [10, 11]
MS/DIM-L20=Photo/Motion Sensor for Dimming Operation, 9' - 20' Mounting Height [10, 11]
MS/DIM-L40W=Photo/Motion Sensor for Dimming Operation, 21' - 40' Mounting Height [10, 11]
ZW=Wavelinx-enabled 4-PIN Twistlock Receptacle [10, 11, 12, 13]
ZW-SWPD4WH=Wavelinx Wireless Sensor, 7' - 15' Mounting Height, White [10, 11, 12, 13]
ZW-SWPD5WH=Wavelinx Wireless Sensor, 15' - 40' Mounting Height, White [10, 11, 12, 13]
LWR-LW= LumaWatt Pro Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [10, 14]
LWR-LN=LumaWatt Pro Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [10, 14]
5LTD=Fifth Light Dali Driver [10, 15]
DIM=0-10V External Dimming Leads [10, 16]
VS=Tempered Glass Vandal Shield

Accessories (Order Separately) [17]

ARSA-XX=Single Pole Mount Arm [18]
ARWM-XX=Wall Mount Arm
ARTA15-XX=Twin Mount Bracket [18]
ARPA4-XX=Pole Adapter 4" O.D. Pole
FSIR-100=Wireless Configuration Tool for Occupancy Sensor [19]
SWPD4-WH=Wavelinx Wireless Sensor, 7' - 15' Mounting Height, White [13, 20]
SWPD5-WH=Wavelinx Wireless Sensor, 16' - 40' Mounting Height, White [13, 20]
WOLC-7P-10A=Wavelinx Outdoor Control Module (7-PIN) [10, 21]

NOTES:
1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional information.
2. Fixture slipfits over standard 2-3/8" tenon. 3" O.D. tenon when used with a ARPA4-XX 4" O.D. pole adapter.
3. Standard 4000K CCT, nominal 70CRI.
4. B4 only available with Type V distribution.
5. Requires the use of a step down transformer.
6. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
7. Custom and RAL color matching available upon request. Consult your lighting representative at Eaton for more information.
8. Extended lead times apply. Use dedicated IES files when performing layouts. These files are published on the Arbor luminaire product page on the website.
9. Not available with B3 lumen package in Type II, III, or IV distributions.
10. Controls system is not available with photocontrol (PC), photocontrol receptacle (PER or PER7), or other controls systems (MS, ZW, LWR, 5LTD, or DIM).
11. Not available with HA option.
12. Sensor passive infrared (PIR) may be overly sensitive below -20°C (-4°F).
13. In order for device to be field-configurable, requires WAC Gateway components WAC-POE and WPOE-120 in appropriate quantities. Only compatible with WaveLinx system and software and requires system components to be installed for operation. See website for more WaveLinx application information.
14. LumaWatt Pro wireless sensors are factory installed and require network components LWP-EM-1, LWP-GW-1, and LWP-PoE8 in appropriate quantities. See website for LumaWatt Pro application information.
15. Only available in B1 and B2 lumen packages.
16. Low voltage control leads brought 18" outside fixture.
17. Replace XX with paint color.
18. Fits on 3" O.D. x 4" long tenon for nominal 4-1/2" O.D. pole top.
19. This tool enables adjustment to Motion Sensor (MS) parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative for more information.
20. Requires Wavelinx-enabled 4-PIN twistlock receptacle (ZW) option.
21. Requires 7-PIN NEMA twistlock photocontrol receptacle (PER7) option.

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

Altitude®

FEATURES

- Elegant form factor
- High performance optics up to 17,500 delivered lumens
- Diffusion lens for low glare comfort
- NX™ wireless control options



Altitude

c UL us LISTED

3000K and warmer CCTs only

CONTROL TECHNOLOGY

NX DISTRIBUTED INTELLIGENCE

RELATED PRODUCTS

Ouro Pavilion PGL8

SPECIFICATIONS

CONSTRUCTION

- One piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 with vents and .100" minimum wall thickness
- Separate internal driver compartment rated for IP66 ingress protection
- Finish: fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat
- Standard colors include (BLS) Black Gloss Smooth, (BLT) Black Matte Textured, (DBS) Dark Bronze Gloss Smooth, (GTT) Graphite Matte Textured, (LGS) Light Gray Gloss Smooth, (PSS) Platinum Silver Smooth, (VGS) Verde Green Smooth, (WH) White, and (CC) Custom Color (Include RAL#)
- Lens is impact resistant 1/8" tempered glass with anti-reflective coating
- Lens has a one-piece extruded vulcanized silicone gasket
- Lens frame one piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 and .100" minimum wall thickness
- Lens frame has a one-piece O-ring extruded vulcanized silicone gasket
- Mid-frame one piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 and .100" minimum wall thickness
- Mid-frame secures to Lens Frame and housing by stainless steel recessed Allen-head screws
- Silicone gaskets throughout
- All external fasteners are stainless steel

OPTICS

- LEDs mount to a metal printed circuit board assembly (MCPCB)
- Optical lenses are clear injection molded PMMA acrylic

INSTALLATION

- Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury

ELECTRICAL

- Universal voltage, 120 through 277V with a ±10% tolerance. Driver is Underwriters Laboratories recognized
- High voltage configurations, 347/480. Driver has a 0-10V dimming interface for multi-level illumination options. Driver is Underwriters Laboratories recognized
- "Thermal Shield", secondary side, thermistor provides protection for the sustainable life of LED module and electronic components
- Drivers shall have greater than a 0.9 power factor, less than 20% harmonic distortion, and be suitable for operation in -40°C to 40°C ambient environments
- Luminaire shall be capable of operating at 100% brightness in a 40°C environment. Both driver and optical array have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C

ELECTRICAL (CONTINUED)

- Dimming range from 10% to 100% through the use of standard 0-10V interface on the programmable driver
- Modular wiring harness in the service area provides user access to the dimming circuitry
- Optional factory programmed dimming profile
- Surge protection: 10,000k in parallel, 20,000k in series
- SF for 120, 277, 347 Line volts
  DF for 208, 240, 480 Line volts
- Wiring: No. 18AWM rated 105°C, wet rating.

CERTIFICATIONS AND LISTINGS

- UL 1598 Standard for Luminaires
- IP66 certified
- RoHS compliant

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	1,673–18,452
Wattage Range	22–156
Efficacy Range (LPW)	56–137
Reported Life (Hours)	L70/60,000
Weight	21.5 lbs 9.75 kg
EPS Front View / Side View	.37 / .64

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HUBBELL Lighting

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

ORDERING GUIDE

Example: ALT1-54L-120-3K8-3-UNV-A34-GT-NXSPW30F-CLR

CATALOG #

HOUSING

ALT1

Housing		LED Engine		CCT/CRI		Distribution		Rotation		Voltage	
ALT1	Architectural Area/Site	**28L-20**	20W, 3,000 lm	**AM**	Amber[9]	**FR**	Type I/Front Row		Blank for no rotation	**UNV**	Universal 120–277V
		28L-40	40W, 5,000 lm	**3K7**	3000K, 70 CRI	**2**	Type II	**L**	Optic rotation left[1]	**347**	347V
		28L-60	60W, 7,500 lm	**3K8**	3000K, 80 CRI	**3**	Type III	**R**	Optic rotation right[1]	**480**	480V
		28L-85	85W, 10,000 lm	**3K9**	3000K, 90 CRI	**4**	Type IV				
		54L-95	95W, 12,500 lm	**4K7**	4000K, 70 CRI	**4W**	Type IV Wide				
		54L-120	120W, 15,000 lm	**4K8**	4000K, 80 CRI	**5QM**	Type V Square Medium				
		54L-155	155W, 17,500 lm	**5K7**	5000K, 70 CRI	**5QN**	Type V Square Narrow				
				5K8	5000K, 80 CRI	**5R**	Type V Rectangular				
						5W	Type V Wide (Round)				

Mounting		Fixture Finish		Control Options		Options		Control Accessories	
ASQ	Arm Square pole	**BL**	Black	**7PR**	7 pin PCR, wireless control enabled	**BC**	Backlight Control[6]	**SCPREMOTE**	Remote control for SCP option. Order at least one per project to program and control the occupancy sensor
A34	Arm mt 3.3–4.2" OD pole	**DB**	Dark Bronze	**7PR-TL**	7 pin PCR with twist lock photocontrol	**SF**	Single Fuse	**SW7PR**	SiteSync™ on fixture module via 7PR
A46	Arm mt 4.5–6.0" OD pole	**GT**	Graphite	**7PR-SC**	7 pin PCR with shorting cap	**DF**	Double Fuse	**SWUSB**	SiteSync™ Software on USB
MAF	Horizontal Slipfitter 2.375" OD arm	**LG**	Light Grey	**AD-012**	AstroDIM: 50% output at midnight[10]	**TB**	Terminal Block	**SWTAB**	SiteSync™ Windows Tablet[8]
SVSF	Vertical Slipfitter Mount square for 2" pipe tenon, (2.375" OD)	**PS**	Platinum Silver	**AD-022**	AstroDIM: 50% output midnight to 4 AM[10]	**CLR**	Clear Lens	**SWBRG**	SiteSync™ Wireless Bridge Node
VSF	Vertical Slipfitter Mount for 2" pipe tenon, (2.375" OD)	**TT**	Titanium	**AD-032**	AstroDIM: 50% output 10PM[10]	**HDL**	Diffuse Lens[7]	**SWFC**	SiteSync™ Field Commission Service
WB	Wall Bracket for area wall mount	**WH**	White	**AD-042**	AstroDIM: 50% output 10PM to 4AM[10]			**WIR-RME-L**	wiSCAPE™ External Fixture Module
		CC	Custom Color[2]	**NXSP14F**	Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' [3,4]			**NXOFM-1R1D-UNV**	NX External Contol Node
				NXSP30F	Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' [3,4]				
				NXSPW14F	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' [3,4]				
				NXSPW30F	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' [3,4]				
				NXWE	NX Wireless Enabled				
				SCL-8F	Low voltage sensor for 3rd party wireless controls via 7PR. For mounting heights up to 8'				
				SCL-40F	Low voltage sensor for 3rd party wireless controls via 7PR. For mounting heights 9' to 40'				
				SCP-8F	Remote control programable line voltage sensor, use with SCPREMOTE				
				SCP-40F	Remote control programable line voltage sensor, use with SCPREMOTE				
				SWP	Site Sync™ Pre Commission Wireless Module[3,4,5]				
				SWPM-40F	Site Sync with Sensor 9' to 40' MH[3,4,5]				

Notes:

1 Not available with 5QM and 5W distributions

2 Consult factory

3 Not available with other sensor or wireless control options

4 Not available in 480V

5 Specify group and zone at time of order, See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node

6 Not available with Type 5 distributions, CLR, or HDL option

7 Only available in Type 3 or Type 5W

8 Microsoft, Encarta, MSN, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries

9 Wildlife friendly

10 Not available for 28L-20 engine and sensor options

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HUBBELL Lighting

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

PRODUCT EXCEPTIONS & DETAILS

Configuration			EPA
	1SA	1 Arm Side Mount	0.98
	2SB	2 Arm Side Mount	1.48
	2SL	2 Arm Side Mount	1.96
	3ST	3 Arm Side Mount	2.20

Configuration			EPA
	3SY*	3 Arm Side Mount	2.46
	4SC	4 Arm Side Mount	2.46
	1W	Single Wall Mount	n/a
	HSF	Horizontal Slipfitter	n/a

DELIVERED LUMENS

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	20	3,000	No Lens	FR	3110	0	0	0	141	3274	0	0	0	149	3318	1	0	0	148
				FR-BC	2036	0	0	0	93	2143	0	0	0	97	2172	0	0	0	97
				2	2903	1	0	1	132	3056	1	0	1	139	3097	1	0	1	138
				2-BC	1771	0	0	0	80	1864	0	0	0	85	1889	0	0	0	84
				3	2945	1	0	1	131	3100	1	0	1	138	3141	1	0	1	140
				3-BC	1779	0	0	1	81	1873	0	0	1	85	1898	0	0	1	85
				4	2943	0	0	1	134	3098	0	0	1	141	3139	0	0	1	141
				4-BC	2189	0	0	1	100	2304	0	0	1	105	2335	0	0	1	104
				4W	2927	1	0	1	133	3081	1	0	1	140	3122	1	0	1	139
				4W-BC	1673	0	0	1	76	1761	0	0	1	80	1785	0	0	1	80
				5R	3025	2	0	2	137	3184	2	0	2	145	3227	2	0	2	144
				5QM	3069	2	0	0	139	3230	2	0	0	147	3273	2	0	0	146
				5QN	3051	2	0	0	139	3211	2	0	0	146	3254	2	0	0	145
				5W	3024	2	0	1	137	3183	2	0	1	145	3226	2	0	1	144
			Clear Lens	FR	2909	0	0	0	132	3062	0	0	0	139	3103	0	0	0	141
				2	2715	1	0	1	123	2858	1	0	1	130	2896	1	0	1	132
				3	2754	1	0	1	125	2899	1	0	1	132	2938	1	0	1	134
				4	2752	0	0	1	125	2897	0	0	1	132	2936	0	0	1	133
				4W	2738	1	0	1	124	2882	1	0	1	131	2920	1	0	1	133
				5R	2829	2	0	2	129	2978	2	0	2	135	3018	2	0	2	137
				5QM	2870	2	0	0	130	3021	2	0	0	137	3062	2	0	0	139
				5QN	2853	2	0	0	130	3003	2	0	0	137	3044	2	0	0	138
				5W	2829	2	0	1	129	2977	2	0	1	135	3017	2	0	1	137
			HDL Lens	3	2341	1	0	1	106	2464	1	0	1	112	2497	1	0	1	114
				5W	2405	1	0	1	109	2531	1	0	1	115	2565	1	0	1	117

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HUBBELL Lighting

ALT1

ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	40	5,000	No Lens	FR	4870	1	0	0	128	5127	1	0	0	135	5195	1	0	0	137
				FR-BC	3189	0	0	0	84	3356	0	0	0	88	3401	0	0	0	90
				2	4546	1	0	1	120	4785	1	0	1	126	4849	1	0	1	128
				2-BC	2773	0	0	1	73	2919	0	0	1	77	2958	0	0	1	78
				3	4611	1	0	2	121	4854	1	0	2	128	4919	1	0	2	129
				3-BC	2786	0	0	1	73	2933	0	0	1	77	2972	0	0	1	78
				4	4608	1	0	2	121	4851	1	0	2	128	4915	1	0	2	129
				4-BC	3428	0	0	1	90	3608	0	0	1	95	3656	0	0	1	96
				4W	4584	1	0	2	121	4825	1	0	2	127	4889	1	0	2	129
				4W-BC	2621	0	0	1	69	2758	0	0	1	73	2795	0	0	1	74
				5R	4737	2	0	2	125	4986	3	0	1	131	5053	3	0	3	133
				5QM	4806	2	0	1	126	5058	2	0	1	133	5126	2	0	1	135
				5QN	4777	2	0	0	126	5028	2	0	0	132	5096	2	0	0	134
				5W	4736	3	0	1	125	4985	2	0	2	131	5052	3	0	1	133
			Clear Lens	FR	4555	1	0	0	120	4795	1	0	0	126	4859	1	0	0	128
				2	4252	1	0	1	112	4476	1	0	1	118	4536	1	0	1	119
				3	4333	1	0	1	114	4561	1	0	1	120	4622	1	0	1	121
				4	4310	0	0	2	113	4537	1	0	2	119	4598	1	0	2	121
				4W	4287	1	0	2	113	4513	1	0	2	119	4573	1	0	2	120
				5R	4431	2	0	2	117	4663	2	0	2	123	4726	2	0	2	124
				5QM	4495	2	0	1	118	4731	2	0	1	125	4794	2	0	1	126
				5QN	4468	2	0	0	118	4703	2	0	0	124	4766	2	0	0	125
				5W	4430	3	0	1	117	4663	3	0	1	123	4725	3	0	1	124
			HDL Lens	3	3741	1	0	1	98	3937	1	0	1	104	3990	1	0	1	105
				5W	3891	2	0	1	102	4095	2	0	1	108	4150	2	0	1	109

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	60	7,500	No Lens	FR	7347	1	0	1	122	7733	1	0	1	129	7837	1	0	1	131
				FR-BC	4810	0	0	0	80	5063	0	0	0	84	5131	0	0	0	86
				2	6858	1	0	2	114	7218	1	0	2	120	7315	1	0	2	122
				2-BC	4183	0	0	1	70	4403	0	0	1	73	4462	0	0	1	74
				3	6956	1	0	2	116	7322	1	0	2	122	7420	1	0	2	123
				3-BC	4203	0	0	1	70	4424	0	0	1	74	4483	0	0	1	75
				4	6951	1	0	2	116	7317	1	0	2	122	7415	1	0	2	124
				4-BC	5171	0	0	2	86	5443	0	0	2	91	5516	0	0	2	92
				4W	6915	1	0	2	115	7278	1	0	2	121	7376	1	0	2	123
				4W-BC	3953	0	0	2	66	4161	0	0	2	69	4216	0	0	2	70
				5R	7145	3	0	3	119	7521	3	0	3	125	7622	3	0	3	127
				5QM	7249	3	0	1	121	7630	3	0	1	127	7732	3	0	1	129
				5QN	7206	3	0	0	120	7585	3	0	0	126	7687	3	0	0	128
				5W	7144	3	0	2	119	7520	3	0	2	125	7620	3	0	2	127
			Clear Lens	FR	6872	1	0	1	115	7233	1	0	1	121	7330	1	0	1	122
				2	6414	1	0	2	107	6751	1	0	2	113	6842	1	0	2	114
				3	6506	1	0	2	108	6848	1	0	2	114	6940	1	0	2	116
				4	6502	1	0	2	108	6844	1	0	2	114	6935	1	0	2	116
				4W	6468	1	0	2	108	6807	1	0	2	113	6899	1	0	2	115
				5R	6683	3	0	3	111	7035	3	0	3	117	7129	3	0	3	119
				5QM	6780	3	0	1	113	7137	3	0	1	119	7232	3	0	1	121
				5QN	6740	2	0	0	112	7094	3	0	0	118	7189	3	0	0	120
				5W	6682	3	0	2	111	7033	3	0	2	117	7128	3	0	2	119
			HDL Lens	3	5531	2	0	1	92	5821	2	0	1	97	5899	2	0	1	98
				5W	5680	2	0	1	95	5979	2	0	1	100	6059	2	0	1	101

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	85	10,000	No Lens	FR	9699	1	0	1	113	10209	1	0	1	119	10346	1	0	1	120
				FR-BC	6350	0	0	1	74	6684	0	0	1	78	6773	0	0	1	79
				2	9054	1	0	2	105	9530	2	0	2	111	9657	2	0	2	112
				2-BC	5523	0	0	1	64	5813	0	0	1	68	5891	0	0	1	68
				3	9183	1	0	2	107	9666	1	0	2	112	9795	1	0	2	114
				3-BC	5549	0	0	2	65	5841	0	0	2	68	5919	0	0	2	69
				4	9177	1	0	2	107	9660	1	0	2	112	9789	1	0	2	114
				4-BC	6827	0	0	2	79	7186	0	0	2	84	7282	0	0	2	85
				4W	9129	1	0	3	106	9609	1	0	3	112	9737	1	0	3	113
				4W-BC	5219	0	0	2	61	5493	0	0	2	64	5567	0	0	2	65
				5R	9433	3	0	3	110	9929	3	0	3	115	10062	3	0	3	117
				5QM	9570	3	0	1	111	10073	3	0	1	117	10208	3	0	1	119
				5QN	9514	3	0	0	111	10014	3	0	0	116	10148	3	0	0	118
				5W	9432	4	0	2	110	9927	4	0	2	115	10060	4	0	2	117
			Clear Lens	FR	9072	1	0	1	105	9549	1	0	1	111	9677	1	0	1	113
				2	8468	1	0	2	98	8913	1	0	2	104	9033	1	0	2	105
				3	8589	1	0	2	100	9041	1	0	2	105	9162	1	0	2	107
				4	8584	1	0	2	100	9035	1	0	2	105	9156	1	0	2	106
				4W	8538	1	0	2	99	8987	1	0	3	105	9108	1	0	3	106
				5R	8823	3	0	3	103	9287	3	0	3	108	9411	3	0	3	109
				5QM	8951	3	0	1	104	9422	3	0	1	110	9548	3	0	1	111
				5QN	8898	3	0	0	103	9366	3	0	0	109	9491	3	0	0	110
				5W	8822	3	0	2	103	9285	4	0	2	108	9410	4	0	2	109
			HDL Lens	3	7302	2	0	2	85	7685	2	0	2	89	7788	2	0	2	91
				5W	7499	2	0	1	87	7893	2	0	1	92	7999	2	0	1	93

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	95	12,500	No Lens	FR	11792	1	0	1	125	12412	1	0	1	132	12578	1	0	1	134
				FR-BC	7848	0	0	1	83	8260	0	0	1	88	8371	0	0	1	90
				2	11210	2	0	2	119	11800	2	0	2	126	11958	2	0	2	126
				2-BC	5993	0	0	1	64	6308	0	0	1	67	6392	0	0	1	69
				3	11225	1	0	2	119	11815	2	0	2	126	11974	2	0	2	127
				3-BC	6273	0	0	2	67	6603	0	0	2	70	6691	0	0	2	72
				4	11311	1	0	2	120	11906	1	0	3	127	12065	1	0	3	128
				4-BC	7291	0	0	2	78	7674	0	0	2	82	7777	0	0	2	84
				4W	11203	2	0	3	119	11792	2	0	3	125	11950	2	0	3	127
				4W-BC	5603	0	0	2	60	5898	0	0	2	63	5977	0	0	2	65
				5R	11623	3	0	3	124	12234	3	0	3	130	12398	3	0	3	131
				5QM	11770	3	0	2	125	12389	3	0	2	132	12555	3	0	2	133
				5QN	11799	3	0	0	126	12420	3	0	0	132	12586	3	0	0	133
				5W	11594	4	0	2	123	12204	4	0	2	130	12367	4	0	2	131
			Clear Lens	FR	11029	1	0	1	117	11609	1	0	1	124	11765	1	0	1	125
				2	10485	2	0	2	112	11036	2	0	2	117	11184	2	0	2	119
				3	10555	1	0	2	112	11110	1	0	2	118	11259	1	0	2	120
				4	10579	1	0	2	113	11136	1	0	2	118	11285	1	0	2	120
				4W	10479	1	0	3	111	11029	2	0	3	117	11177	2	0	3	119
				5R	10871	3	0	3	116	11443	3	0	3	122	11596	3	0	3	123
				5QM	11009	3	0	2	117	11588	3	0	2	123	11743	3	0	2	125
				5QN	11036	3	0	0	117	11616	3	0	0	124	11772	3	0	0	125
				5W	10845	4	0	2	115	11415	4	0	2	121	11568	4	0	2	123
			HDL Lens	3	8736	2	0	2	93	9195	2	0	2	98	9318	2	0	2	100
				5W	9152	3	0	1	97	9633	3	0	1	102	9762	3	0	1	104

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	120	15,000	No Lens	FR	14390	1	0	1	118	15146	1	0	1	124	15349	1	0	1	125
				FR-BC	9577	1	0	1	78	10080	1	0	1	83	10215	1	0	1	84
				2	13680	2	0	2	112	14399	2	0	2	118	14592	2	0	2	120
				2-BC	7313	0	0	1	60	7697	0	0	2	63	7800	0	0	2	64
				3	13698	2	0	3	112	14418	2	0	3	118	14611	2	0	3	120
				3-BC	7655	0	0	2	63	8057	0	0	2	66	8165	0	0	2	67
				4	13803	1	0	3	113	14528	1	0	3	119	14723	1	0	3	121
				4-BC	8897	0	0	2	73	9365	0	0	2	77	9490	0	0	2	78
				4W	13671	2	0	3	112	14390	2	0	3	118	14583	2	0	4	120
				4W-BC	6838	1	0	2	56	7197	1	0	2	59	7294	1	0	2	60
				5R	14184	4	0	4	116	14929	4	0	4	122	15129	4	0	4	124
				5QM	14363	3	0	2	118	15118	4	0	2	124	15321	4	0	2	126
				5QN	14399	4	0	4	118	15156	4	0	1	124	15359	4	0	1	126
				5W	14149	4	0	2	116	14893	4	0	2	122	15092	4	0	2	124
			Clear Lens	FR	13459	1	0	1	110	14167	1	0	1	116	14356	1	0	2	118
				2	12795	2	0	2	105	13468	2	0	2	110	13648	2	0	2	112
				3	12812	2	0	2	105	13486	2	0	2	111	13666	2	0	2	112
				4	12910	1	0	3	106	13589	1	0	3	111	13771	1	0	3	113
				4W	12787	2	0	3	105	13459	2	0	3	110	13640	2	0	3	112
				5R	13266	4	0	4	109	13964	4	0	4	114	14151	4	0	4	116
				5QM	13434	3	0	2	110	14140	3	0	2	116	14330	3	0	2	117
				5QN	13467	4	0	0	110	14175	4	0	0	116	14365	4	0	0	118
				5W	13234	4	0	2	108	13929	4	0	2	114	14116	4	0	2	116
			HDL Lens	3	10892	3	0	2	89	11464	3	0	2	94	11618	3	0	2	95
				5W	11250	3	0	1	92	11841	3	0	2	97	12000	3	0	2	98

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ARCHITECTURAL AREA/SITE

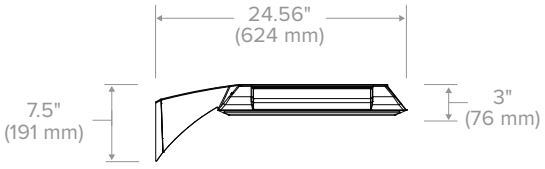
DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	155	17,500	No Lens	FR	17299	2	0	2	111	18208	2	0	2	117	18452	2	0	2	119
				FR-BC	11513	1	0	1	74	12118	1	0	1	78	12280	1	0	1	79
				2	16445	2	0	2	105	17310	2	0	3	111	17542	2	0	3	112
				2-BC	8791	0	0	2	56	9253	0	0	2	59	9377	0	0	2	60
				3	16467	2	0	3	106	17333	2	0	3	111	17565	2	0	3	113
				3-BC	9202	1	0	2	59	9686	1	0	2	62	9816	1	0	2	63
				4	16593	1	0	3	106	17465	1	0	3	112	17699	1	0	4	113
				4-BC	10696	0	0	2	69	11258	1	0	2	72	11409	1	0	2	73
				4W	16435	2	0	4	105	17299	2	0	4	111	17531	2	0	4	112
				4W-BC	8220	1	0	2	53	8652	1	0	2	55	8768	1	0	2	56
				5R	17051	4	0	4	109	17947	4	0	4	115	18188	4	0	4	117
				5QM	17267	4	0	2	111	18174	4	0	2	117	18418	4	0	2	118
				5QN	17309	4	0	1	111	18219	4	0	1	117	18463	4	0	1	118
				5W	17009	4	0	2	109	17903	4	0	2	115	18143	4	0	2	116
			Clear Lens	FR	16180	1	0	2	104	17030	1	0	2	109	17258	1	0	2	111
				2	15382	2	0	2	99	16190	2	0	2	104	16407	2	0	2	105
				3	15402	2	0	3	99	16212	2	0	3	104	16429	2	0	3	105
				4	15520	1	0	3	99	16336	1	0	3	105	16555	1	0	3	106
				4W	15372	2	0	4	99	16180	2	0	4	104	16397	2	0	4	105
				5R	15948	4	0	4	102	16787	4	0	4	108	17011	4	0	4	109
				5QM	16150	4	0	2	104	16999	4	0	2	109	17227	4	0	2	110
				5QN	16190	4	0	1	104	17041	4	0	1	109	17269	4	0	1	111
				5W	15909	4	0	2	102	16745	4	0	2	107	16969	4	0	2	109
			HDL Lens	3	13093	3	0	2	84	13782	3	0	2	88	13966	3	0	2	90
				5W	13524	3	0	2	87	14235	3	0	2	91	14426	3	0	2	92

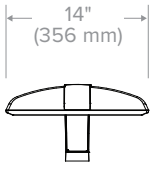
CRI Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

Amber Multiplier	
CCT	Multiplier
5000K	1
AM	0.1727

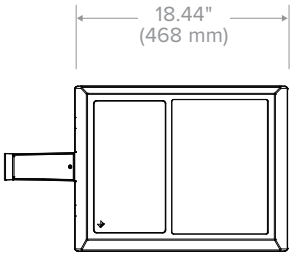
DIMENSIONS



Side View



Front View



Top View

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ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-FR

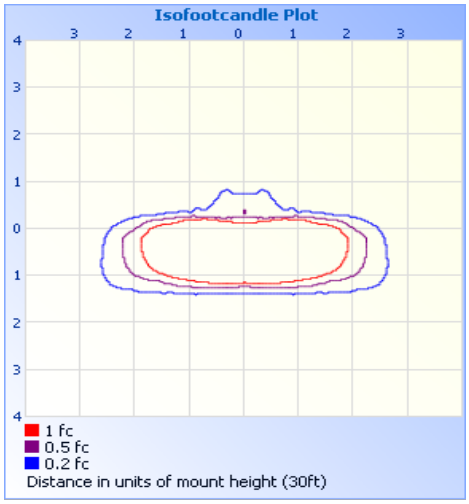
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18208**
Watts	**156**
Efficacy	**116.7**
IES Type	**I**
BUG Rating	**B2-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	16101	88.4%
Downward House Side	2107	11.6%
Downward Total	18208	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18208	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-2

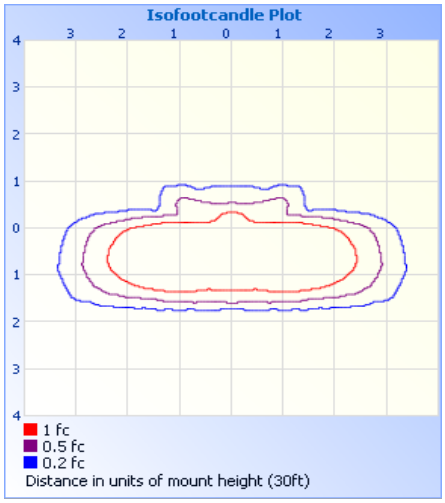
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17309**
Watts	**156**
Efficacy	**111.0**
IES Type	**II**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14323	82.7%
Downward House Side	2986	17.3%
Downward Total	17309	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17309	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-3

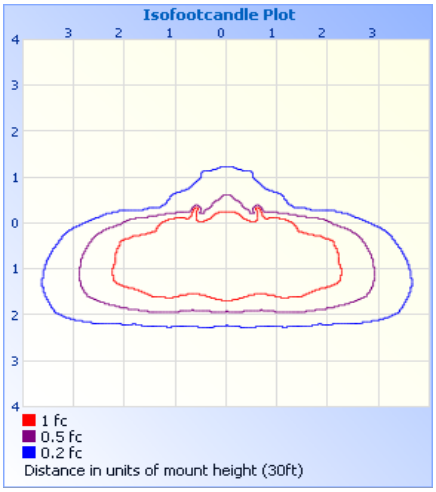
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17332**
Watts	**156**
Efficacy	**111.1**
IES Type	**III**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14911	86.0%
Downward House Side	2421	14.0%
Downward Total	17332	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17332	100%

ISOFOOT CANDLE PLOT



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HUBBELL® Lighting

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-4

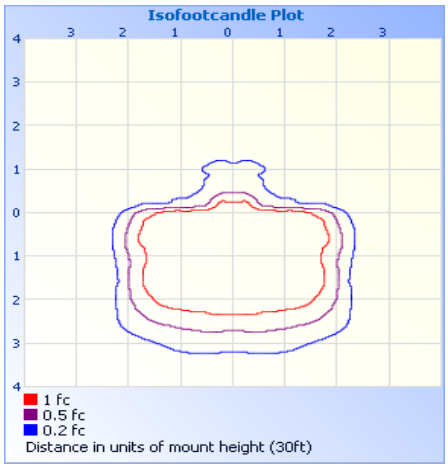
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17465**
Watts	**156**
Efficacy	**112.0**
IES Type	**IV**
BUG Rating	**B1-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15757	90.2%
Downward House Side	1708	9.8%
Downward Total	17465	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17465	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-4W

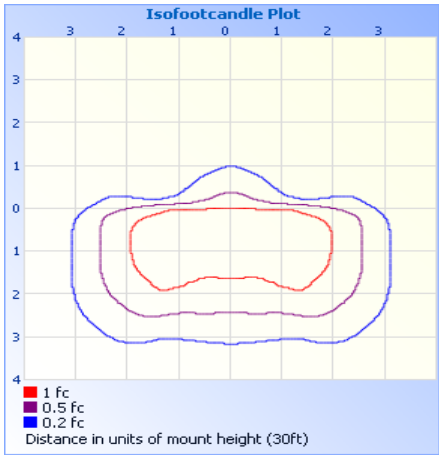
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17299**
Watts	**156**
Efficacy	**110.9**
IES Type	**IV**
BUG Rating	**B2-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15320	88.6%
Downward House Side	1979	11.4%
Downward Total	17299	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17299	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5R

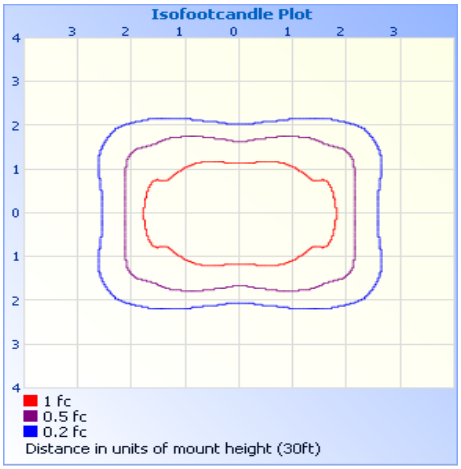
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17947**
Watts	**156**
Efficacy	**115.0**
IES Type	**III**
BUG Rating	**B4-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8974	50.0%
Downward House Side	8974	50.0%
Downward Total	17947	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17947	100%

ISOFOOT CANDLE PLOT



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ALT1

ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-5QM

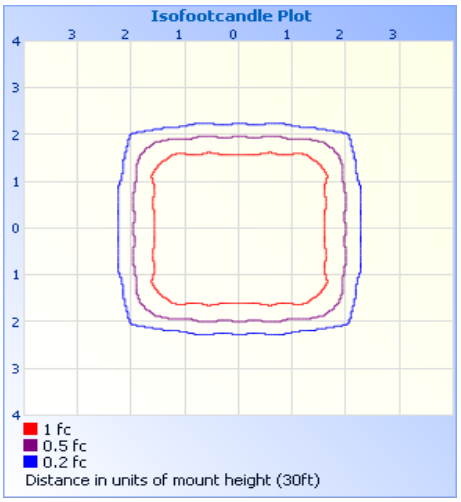
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18173**
Watts	**156**
Efficacy	**116.5**
IES Type	**V**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9087	50.0%
Downward House Side	9087	50.0%
Downward Total	18173	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18173	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5QN

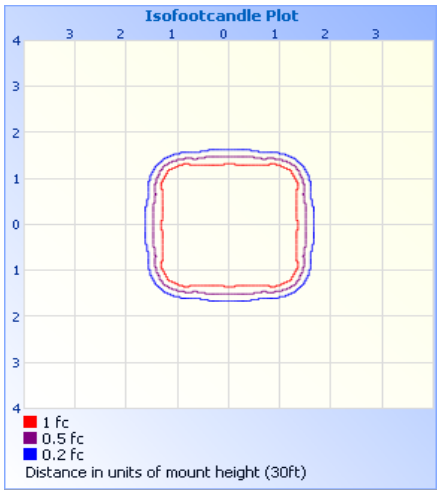
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18219**
Watts	**156**
Efficacy	**116.8**
IES Type	**V**
BUG Rating	**B4-U0-G1**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9110	50.0%
Downward House Side	9110	50.0%
Downward Total	18219	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18219	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5W

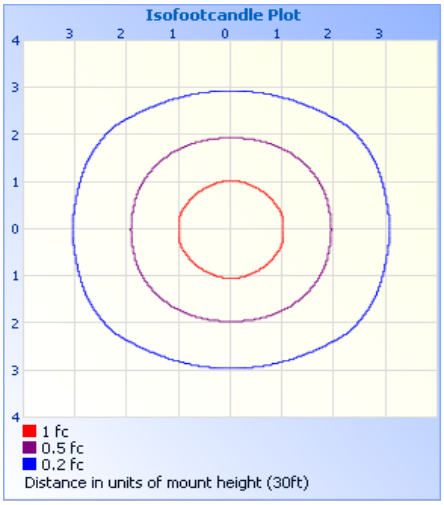
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17904**
Watts	**156**
Efficacy	**114.8**
IES Type	**V**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8952	50.0%
Downward House Side	8952	50.0%
Downward Total	17904	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17904	100%

ISOFOOT CANDLE PLOT



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TYPE: PROJECT:

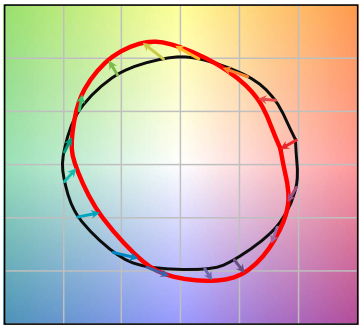
CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

TM-30 DATA

COLOR VECTOR GRAPHIC

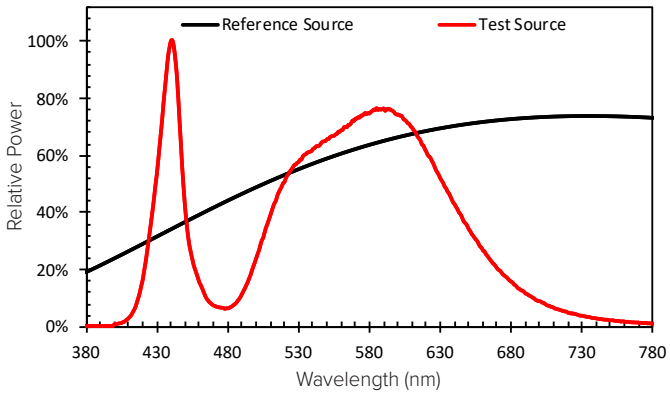


Reference Illuminant — Test Source

TEST SOURCE

R_f	68
R_g	99
CCT(K)	3947
D_{UV}	0.0004
x	0.3831
y	0.3793
CIE R_a	72

SPECTRAL POWER DISTRIBUTION COMPARISON



ELECTRICAL DATA

Electrical													Dimming				
# LED	System Watts	Drive Current	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming Range	Source current out of 0-10V		Absolute voltage range on 0-10V (+)	
			VAC	Hz	120	208	240	277	347	480				Min	Max	Min	Max
28	22	250 mA	120-480	50/60	0.18	0.11	0.09	0.08	0.06	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
	38	400 mA			0.32	0.18	0.16	0.14	0.11	0.08							
	60	650 mA			0.50	0.29	0.25	0.22	0.17	0.13							
	86	950 mA			0.72	0.41	0.36	0.31	0.25	0.18							
54	94	550 mA			0.78	0.45	0.39	0.34	0.27	0.20							
	122	700 mA			1	0.59	0.51	0.44	0.35	0.25							
	156	900 mA			1.30	0.75	0.65	0.56	0.45	0.33							

TM-21 Lifetime Calculation - Projected Lumen Maintenance (25°C / 77°C)						
Hours	0	25,000	36,000	50,000	100,000	Reported L70
Projected Lumen Maintenance	100%	96.9%	95.3%	93.3%	86.6%	> 60,000

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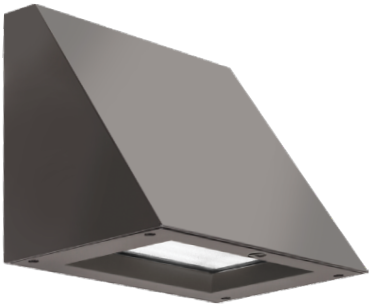


WDGE2 LED
Architectural Wall Sconce

Catalog Number

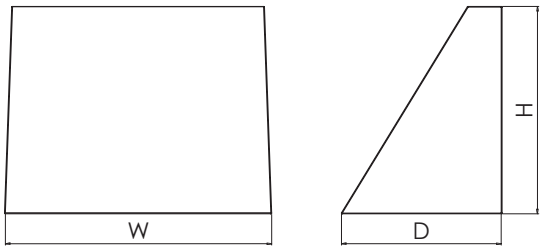
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth: 7″
Height: 9″
Width: 11.5″
Weight: (without options) 13.5 lbs



Introduction

The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.

WDGE2 delivers up to 6,000 lumens with a soft, non-pixelated light source, creating a visually comfortable environment. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

WDGE LED Family Overview

Luminaire	Standard EM, 0°C	Cold EM, -20°C	Sensor	Lumens (4000K)					
				P1	P2	P3	P4	P5	P6
WDGE1 LED	4W	--	--	1,200	2,000	--	--	--	--
WDGE2 LED	10W	18W	Standalone / nLight	1,200	2,000	3,000	4,500	6,000	--
WDGE3 LED	15W	18W	Standalone / nLight	7,500	8,500	10,000	12,000	--	--
WDGE4 LED	--	--	Standalone / nLight	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI VF MVOLT DDBXD

Series	Package		Color Temperature		CRI	Distribution		Voltage	Mounting	
WDGE2 LED	P1[1]	P1SW	27K	2700K	80CRI	VF	Visual comfort forward throw	MVOLT	**Shipped included**	**Shipped separately**
	P2[1]	P2SW	30K	3000K	90CRI	VW	Visual comfort wide	347[3]	SRM Surface mounting bracket	AWS 3/8inch Architectural wall spacer
	P3[1]	P3SW	35K	3500K				480[3]		BBW Surface-mounted back box
	P4[1]	Door with small window (SW) is required to accommodate sensors. See page 2 for more details.	40K	4000K						PBBW Premium surface-mounted back box (top, left, right conduit entry)
	P5[1]		50K[2]	5000K						

Options

E4WH	Emergency battery backup, CEC compliant (4W, 0°C min)
E10WH	Emergency battery backup, CEC compliant (10W, 5°C min)
E20WC	Emergency battery backup, CEC compliant (18W, -20°C min)
PE[4]	Photocell, Button Type
DS[5]	Dual switching (comes with 2 drivers and 2 light engines; see page 3 for details)
DMG[6]	0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)
BCE	Bottom conduit entry for premium back box (PBBW). Total of 4 entry points.

Standalone Sensors/Controls (only available with P1SW, P2SW & P3SW)

PIR	Bi-level (100/35%) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching.
PIRH	Bi-level (100/35%) motion sensor for 15-30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching
PIR1FC3V	Bi-level (100/35%) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation.
PIRH1FC3V	Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation.

Networked Sensors/Controls (only available with P1SW, P2SW & P3SW)

NLTAIR2 PIR	nLightAIR Wireless enabled bi-level motion/ambient sensor for 8-15' mounting heights.
NLTAIR2 PIRH	nLightAIR Wireless enabled bi-level motion/ambient sensor for 15-30' mounting heights.

See page 4 for out of box functionality

Finish

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DSSXD	Sandstone
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white
DSSTXD	Textured sandstone

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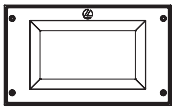
Accessories

Ordered and shipped separately.

WDGEAWS DDBXD U	WDGE 3/8inch Architectural Wall Spacer (specify finish)
WDGE2PBBW DDBXD U	WDGE2 Premium surface-mounted back box (specify finish)
WSBBW DDBXD U	Surface - mounted back box (specify finish)

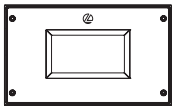
NOTES

1 P1-P5 not available with sensors/controls. Sensors/controls only available with P1SW, P2SW and P3SW.
2 50K not available in 90CRI
3 347V and 480V not available with E4WH, E10WH, E20WC or DS.
4 PE not available in 480V or with sensors/controls
5 DS option not available with E4WH, E10WH, E20WC or sensors/controls.
6 DMG option not available with sensors/controls



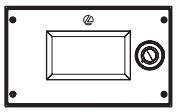
Default configuration with no sensors/controls.

Power Packages: P1, P2, P3, P4, P5



Small Window (SW) configuration

Power Packages: P1SW, P2SW, P3SW



Configuration with sensors/controls

Power Packages: P1SW, P2SW, P3SW

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Dist. Type	27K (2700K, 80 CRI)		30K (3000K, 80 CRI)		35K (3500K, 80 CRI)		40K (4000K, 80 CRI)		50K (5000K, 80 CRI)	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
P1 / P1SW	10W	VF	1,166	119	1,209	123	1,251	128	1,256	128	1,254	128
		VW	1,197	122	1,241	126	1,284	131	1,289	131	1,286	131
P2 / P2SW	15W	VF	1,878	129	1,947	134	2,015	139	2,023	139	2,019	139
		VW	1,927	133	1,997	137	2,067	142	2,075	143	2,071	143
P3 / P3SW	23W	VF	2,908	129	3,015	134	3,119	138	3,132	139	3,126	139
		VW	2,983	132	3,093	137	3,200	142	3,213	143	3,206	142
P4	35W	VF	4,096	117	4,247	121	4,394	126	4,412	126	4,403	126
		VW	4,202	120	4,357	125	4,508	129	4,526	129	4,517	129
P5	48W	VF	5,567	115	5,772	119	5,972	123	5,996	124	5,984	124
		VW	5,711	118	5,921	122	6,127	126	6,151	127	6,139	127

Electrical Load

Performance Package	System Watts	Current (A)					
		120V	208V	240V	277V	347V	480V
P1 / P1SW	10W	0.082	0.049	0.043	0.038	--	--
	13W	--	--	--	--	0.046	0.033
P2 / P2SW	15W	0.132	0.081	0.072	0.064	--	--
	18W	--	--	--	--	0.056	0.041
P3 / P3SW	23W	0.195	0.114	0.100	0.088	--	--
	26W	--	--	--	--	0.079	0.058
P4	35W	0.302	0.175	0.152	0.134	--	--
	38W	--	--	--	--	0.115	0.086
P5	48W	0.434	0.241	0.211	0.184	--	--
	52W	--	--	--	--	0.157	0.119

Lumen Multiplier for 90CRI

CCT	Multiplier
27K	0.845
30K	0.867
35K	0.845
40K	0.885
50K	0.898

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.96	>0.95	>0.91

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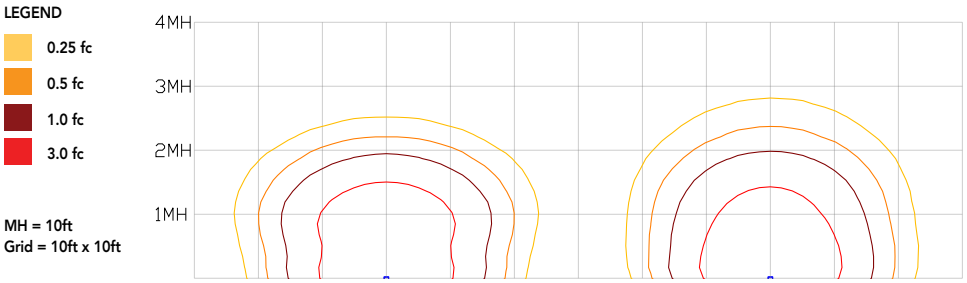
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WDGE LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.



WDGE2 LED P3 40K 80CRI VW

WDGE2 LED P3 40K 80CRI VF

Emergency Egress Options

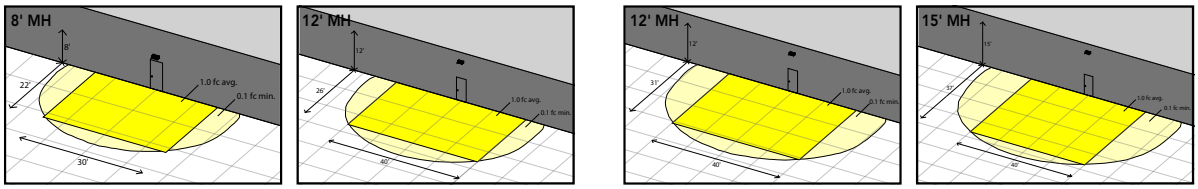
Emergency Battery Backup

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency battery backup configurations include an independent secondary driver with an integral relay to immediately detect loss of normal power and automatically energize the luminaire. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time normal power is lost and maintain a minimum of 60% of the light output at the end of 90minutes.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9

The examples below show illuminance of 1 fc average and 0.1 fc minimum in emergency mode with E10WH or E20WC and VF distribution.

Grid = 10ft x 10ft



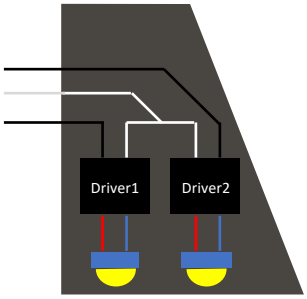
WDGE2 LED xx 40K 80CRI VF MVOLT E10WH

WDGE2 LED xx 40K 80CRI VF MVOLT E20WC

Dual Switching (DS) Option

The dual switching option offers operational redundancy that certain codes require. With this option the luminaire comes integrated with two drivers and two light engines. These work completely independent to each other so that a failure of any individual component does not cause the whole luminaire to go dark. This option is typically used with a back generator or inverter providing emergency power.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9



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Control / Sensor Options

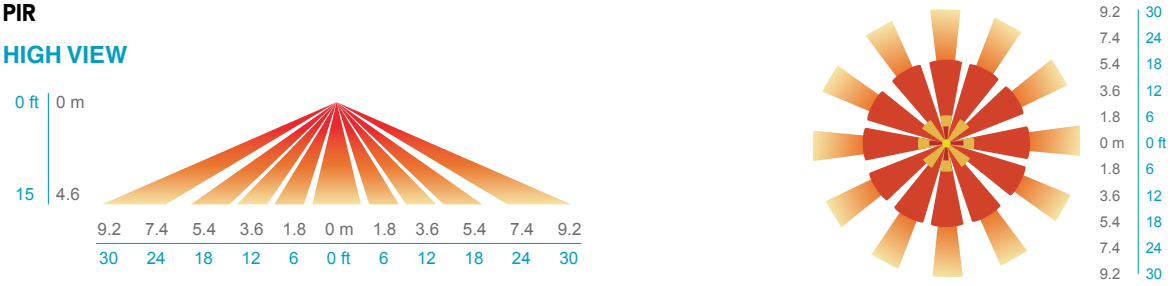
Motion/Ambient Sensor (PIR_, PIRH_)

Motion/Ambeint sensor (Sensor Switch MSOD) is integrated into the the luminaire. The sensor provides both Motion and Daylight based dimming of the luminaire. For motion detection, the sensor utilizes 100% Digital Passive Infrared (PIR) technology that is tuned for walking size motion while preventing false tripping from the environment. The integrated photocell enables additional energy savings during daytime periods when there is sufficient daylight. Optimize sensor coverage by either selecting PIR or PIRH option. PIR option comes with a sensor lens that is optimized to provide maximum coverage for mounting heights between 8-15ft, while PIRH is optimized for 15-40ft mounting height.

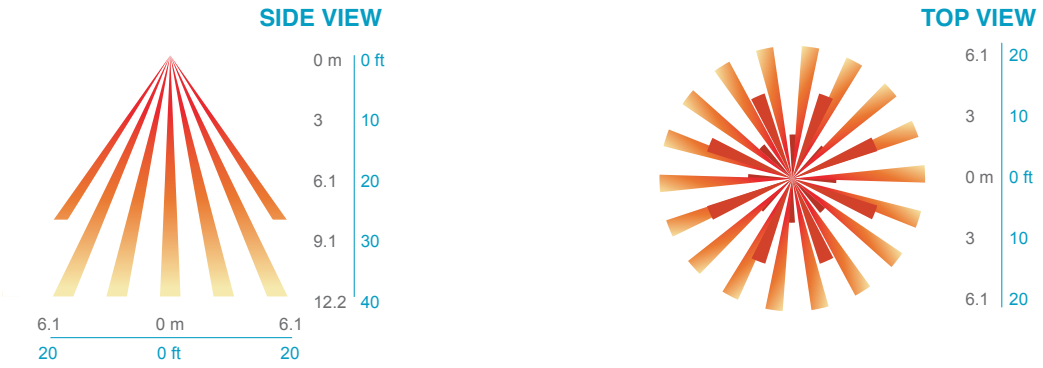
Networked Control (NLTAIR2)

nLight® AIR is a wireless lighting controls platform that allows for seamless integration of both indoor and outdoor luminaires. Five-tier security architecture, 900 MHz wireless communication and app (CLAIRITY™ Pro) based configurability combined together make nLight® AIR a secure, reliable and easy to use platform.

PIR



PIRH



Option	Dim Level	High Level (when triggered	Photocell Operation	Motion Time Delay	Ramp-down Time	Ramp-up Time
PIR or PIRH	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
PIR1FC3V, PIRH1FC3V	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 1fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
NLTAIR2 PIR, NLTAIR2 PIRH (out of box)	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	7.5 min	5 min	Motion - 3 sec Photocell - 45 sec

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Mounting, Options & Accessories



NLTAIR2 PIR – nLight AIR Motion/Ambient Sensor

D = 7″

H = 11″

W = 11.5″

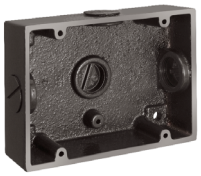


PBBW – Premium Back Box

D = 1.75″

H = 9″

W = 11.5″



BBW – Standard Back Box

D = 1.5″

H = 4″

W = 5.5″



AWS – 3/8inch Architectural Wall Spacer

D = 0.38″

H = 4.4″

W = 7.5″

FEATURES & SPECIFICATIONS

INTENDED USE
Common architectural look, with clean rectilinear shape, of the WDGE LED was designed to blend with any type of construction, whether it be tilt-up, frame or brick. Applications include commercial offices, warehouses, hospitals, schools, malls, restaurants, and other commercial buildings.

CONSTRUCTION
The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP66 rating for the luminaire.

FINISH
Exterior painted parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS
Well crafted reflector optics allow the light engine to be recessed within the luminaire, providing visual comfort, superior distribution, uniformity, and spacing in wall-mount applications. The WDGE LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L91/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire comes with built in 6kV surge protection, which meets a minimum Category C low exposure (per ANSI/IEEE C62.41.2).

INSTALLATION
A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The 3/8″ Architectural Wall Spacer (AWS) can be used to create a floating appearance or to accommodate small imperfections in the wall surface.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP66 rated. PIR options are rated for wet location. Rated for -40°C minimum ambient.
DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY
5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/support/customer-support/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

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BLADE

Vandal Resistant

BLD LED



WALL MOUNT /
MULLION MOUNT LED

Fixture Type

Date

Job Name

Approved By

Catalog Number

SPECIFICATIONS

Description The Blade combines a sleek, patent pending design shaped with high performance, full cut off optics to achieve unobtrusive illumination of a space or path of egress. When mounted overa doorway or mullion, the fixture is perceived as an element of the building structure, and, additionally, provides water protection in the form of a drip cap over the entranceway. Multiple lengths are available to match a given door opening and our quick-mount system facilitates installation and maintenance.

Housing Marine grade heat treated extruded aluminum.
Chemically primed and finished with robotically applied polyester powder coat.

Wall Mount Marine grade heat treated extruded aluminum. Chemically primed and finished with robotically applied polyester powder coat. Designed to provide quick mounting to housing and secured with (2) captive stainless steel TORX® head screws.

Lens Frame Marine grade heat treated extruded aluminum.
Secured to fixture (4) captive stainless steel TORX® head screws.

Lens UV stabilized diffused extruded polycarbonate.

End Plate Die-cast marine grade aluminum.
Chemically primed and finished with robotically applied polyester powder coat.

Drivers Constant current drivers at 700mA.

LED Samsung LM561B+ Series @ 2700K, 3000K, 3500K, 4000K, or 5000K and 82 CRI wired in parallel-series. L_{70} projected life of 130,000 hours at 50ºC. Tested in accordance with LM-80. Ten year warranty on LED boards against operational defects.

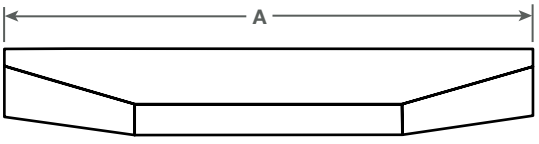
Gaskets Closed cell self-adhesive neoprene to provide watertight seal between fixture and mounting surface.

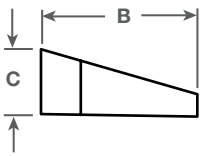
UL Listing U.L., C.UL., Wet standard.

Lifetime Warranty Luminaire LED Incorporated will repair or replace any fixture damaged due to vandalism for the lifetime of the installation.

DIMENSIONAL DATA

	A	B	C
BLD 12	20.0”	5.6”	2.4”
BLD 24	30.8”	5.6”	2.4”
BLD 36	41.6”	5.6”	2.4”
BLD 48	52.4”	5.6”	2.4”
BLD 72	74.0”	5.6”	2.4”





Luminaire Led
a division of the LUMINAIRES GROUP

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P.O. Box 2162
Edison, NJ 08818

www.luminaireled.net
P. 732.549.0056

Luminaire LED Incorporated products are manufactured in the USA with components purchased from USA suppliers, and meet the Buy American requirements under the ARRA. Content of specification sheets is subject to change; please consult our website for current product information.

Rev: 03/19+

ORDERING INFORMATION

SERIES	LED	CCT	VOLTS	DRIVER	LENS	COLOR	OPTIONS		TX/SD
									TX/SD
BLD 12	5W	2700K	120-277	CC	DP	BLK	DIM	EMB10ST	
	10W	3000K		DIM		BRZ	2B	EMB310	
BLD 24	10W	3500K		PRD		SIL	PC	EMB310ST	
	20W	4000K				WHT	PC BT	EMB20R	
BLD 36	15W	5000K				CUST	GLR	EMB125R	
	30W						OCC	EMB250R	
BLD 48	20W						OCC50	EMBDA	
	35W						KO	ST/SC	
BLD 72	30W								
	55W								
	PRD - Specify Watts or Lumens Above								

CC = Constant Current (Standard)
DIM = 0-10V Dimming, 10% at lowest level
PRD = Programmable driver. Specify Watts or Lumens under "LED" in Ordering Information. N/A with BLD 12.

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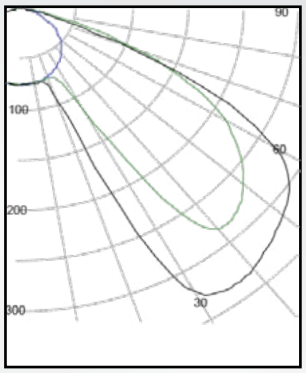
OPTIONS

LENS	DP = Diffused Polycarbonate.
COLORS	BLK = Black BRZ = Bronze SIL = Silver WHT = White CUST = Custom Color (Consult Factory)
DIM	0-10V dimming driver. 10% at lowest level. N/A with BLD 12.
PC	Photoelectric switch. N/A with 2B option or any EMB options.
PC BT	Bluetooth connected daylight harvesting photocell mounted in machine hole in lens frame. Optional passive infrared occupancy sensor. N/A with EMB options in BLD 12, BLD24, and BLD36.
2B	(2) LED drivers for independent LED board operation. N/A with BLD 12, N/A with OCC options, N/A with EMB310, N/A with EMB310ST.
GLR	Fuse and fuse holder.
OCC	Passive infrared sensor mounted in machine hole in lens frame for on/off operation. Maximum coverage of 10' radius from 8' height. N/A with BLD 12.
OCC50	Passive infrared sensor mounted in machine hole in lens frame. 50% of LED's constantly on and 50% sensored. N/A with BLD 12 and BLD 24.
KO	1/2" knock out in both end plates.
EMB10ST	1000 lumen self-testing, self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Not available in 347V. Available for BLD24, BLD36, BLD48, and BLD72 lengths only. N/A with 2B option in BLD24. Meets CA Title 20 Standards.
EMB310	1000 lumen self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Available for BLD36, BLD48, and BLD72 lengths only. Meets CA Title 20 standards.
EMB310ST	1000 lumen self-testing, self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Available for BLD36, BLD48, and BLD72 lengths only. Meets CA Title 20 Standards.
EMB20R	Remote mounted micro inverter that will operate a 25W maximum load for 90 minutes. 0ºC (32ºF) to 45ºC (113ºF).
EMB125R	Remote inverter that will operate a 125W maximum load for 90 minutes. 20ºC (68ºF) to 30ºC (86ºF). Not available in 347V.
EMB250R	Remote inverter that will operate a 250W maximum load for 90 minutes. 20ºC(68ºF) to 30ºC (86ºF). Not available in 347V.
EMBDA	Two drivers and two emergency battery packs self-contained within fixture for independent light engine operation. Each battery pack will operate each light engine for a minimum of 90 minutes. Available in the BLD 72 only.
ST/SC	Slotted screws instead of TORX® head.
TX/SD	TORX® head bit.

PHOTOMETRIC DATA

Model	Watts	Input Watts		Delivered Lumens									
				2700K		3000K		3500K		4000K		5000K	
BLD 12	5W	6.5W		447		452		461		476		490	
BLD 12	10W	11.8W		875		885		903		931		958	
BLD 24	10W	10.6W		962		973		993		1024		1055	
BLD 24	20W	21.3W		1885		1907		1946		2006		2066	
BLD 36	15W	14.7W		1444		1461		1491		1537		1583	
BLD 36	30W	29.6W		2828		2860		2919		3009		3099	
BLD 48	20W	19.6W		1926		1948		1987		2049		2111	
BLD 48	35W	36.4W		3770		3812		3890		4011		4132	
BLD 72	30W	29.4W		2969		3003		3064		3159		3254	
BLD 72	55W	57.1W		5789		5855		5974		6184		6345	
BLD xx	PRD			Programmable Driver. Must specify Watts or Lumens in Ordering Information.									

MODEL: BLD12-5W-4000K
Delivered Lumens: 476 Lumens

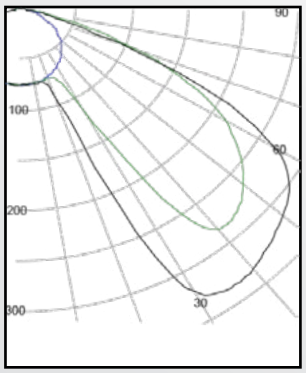


IES FILE: BLD12-5W-4000K
Total Power: 7W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B0U0G1

Zone	Lumens	% Luminaire
0 - 30	69	14.5
0 - 40	149	31.1
0 - 60	359	75.5
60 - 90	117	24.5
0 - 90	476	100.0
90 -180	0	0.0
0 - 180	476	100.0

MODEL: BLD36-15W-4000K
Delivered Lumens: 1537 Lumens

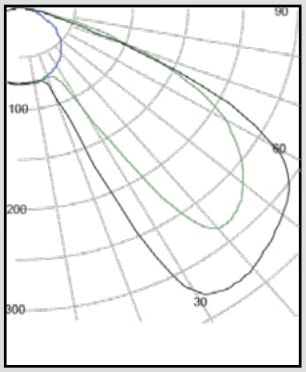


IES FILE: BLD36-15W-4000K
Total Power: 14.7W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B0U0G1

Zone	Lumens	% Luminaire
0 - 30	377	124.5
0 - 40	640	41.6
0 - 60	1219	79.3
60 - 90	317	20.7
0 - 90	1537	100.0
90 -180	0	0.0
0 - 180	1537	100.0

MODEL: BLD36-30W-4000K
Delivered Lumens: 3009 Lumens



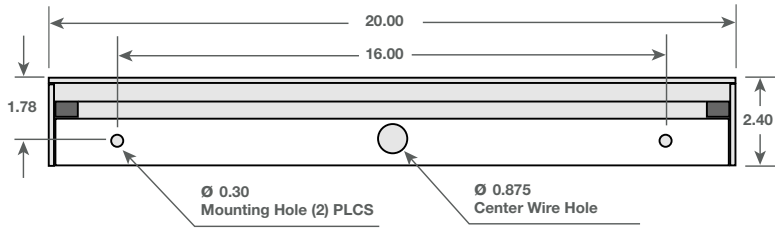
IES FILE: BLD36-30W-4000K
Total Power: 29.6W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B1U0G1

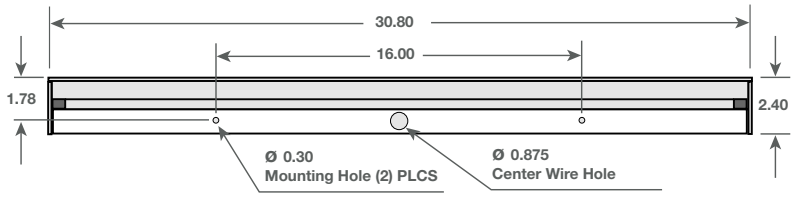
Zone	Lumens	% Luminaire
0 - 30	739	24.6
0 - 40	1253	41.6
0 - 60	2387	79.3
60 - 90	622	20.7
0 - 90	3009	100.0
90 -180	0	0.0
0 - 180	3009	100.0

MOUNTING DETAIL

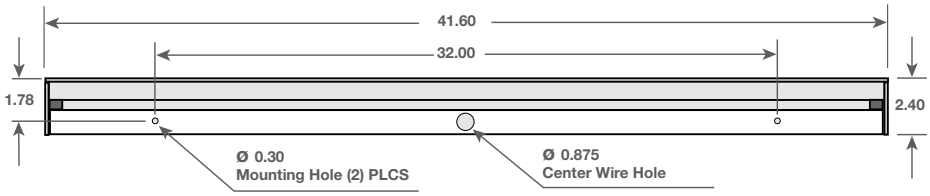
BLD12



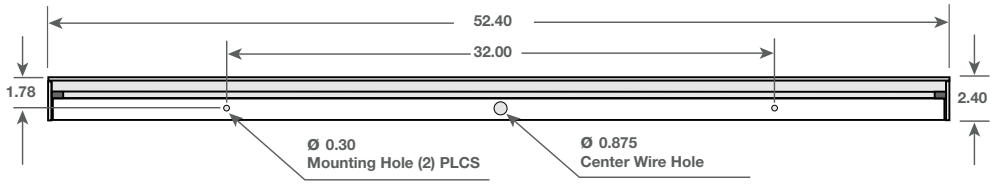
BLD24



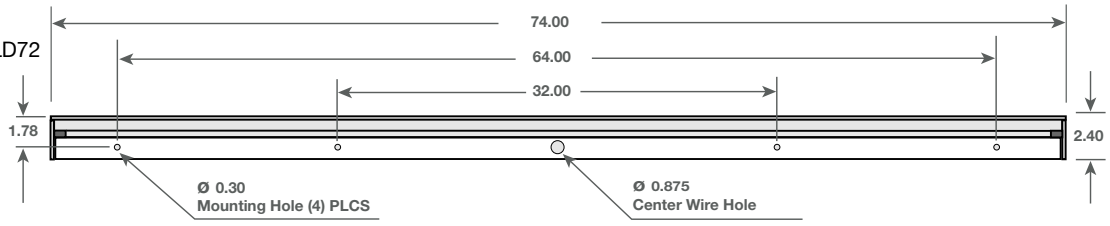
BLD36



BLD48



BLD72



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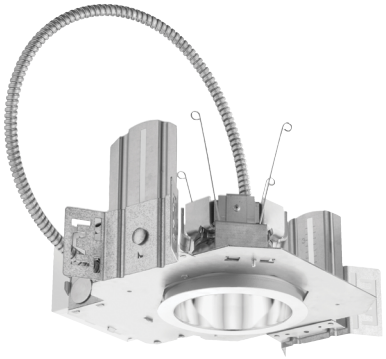
LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

LDN4

4" OPEN
Non-IC
New Construction Downlight



FEATURES & SPECIFICATIONS

INTENDED USE — Typical applications include corridors, lobbies, conference rooms and private offices.

CONSTRUCTION — Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches. Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination 1/2"-3/4" and four 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C standard; high ambient (40°C) option available. Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

OPTICS — LEDs are binned to a 3-step SDCM; 80 CRI minimum. 90 CRI optional.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in specular, semi-specular, or matte diffuse finishes. Also available in white and black painted reflectors.

ELECTRICAL — Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% or 1% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 60,000 hours.

LISTINGS — Certified to US and Canadian safety standards. Wet location standard (covered ceiling). IP55 rated. ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

battery pack

A+ Capable options indicated by this color background.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LDN4 35/15 LO4AR LSS MVOLT EZ1

LDN4													
Series		**Color temperature**		**Lumens**[1]		**Aperture/Trim Color**				**Finish**		**Voltage**	
LDN4	4" round	27/	2700K	05	500 lumens	LO4	Downlight	AR	Clear	LSS	Semi-specular	MVOLT	Multi-volt
		30/	3000K	07	750 lumens	LW4	Wallwash	WR[2]	White	LD	Matte diffuse	120	120V
		35/	3500K	10	1000 lumens			BR[2]	Black	LS	Specular	277	277V
		40/	4000K	15	1500 lumens							347[3]	347V
		50/	5000K	20	2000 lumens								
				25	2500 lumens								
				30	3000 lumens								
				40	4000 lumens								

Driver		**Options**		**Options**	
GZ10	0-10V driver dims to 10%	SF[4]	Single fuse	N80[8]	nLight™ Lumen Compensation
GZ1	0-10V driver dims to 1%	TRW[6]	White painted flange	NPS80EZ[7,10]	nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1).
EZ10	0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 10%	TRBL[6]	Black painted flange	NPS80EZER[7,10]	nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1). ER controls fixtures on emergency circuit.
EZ1	0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 1%	EL[5]	Emergency battery pack with integral test switch. 10W Constant Power, Not Certified in CA Title 20 MAEDBS	HAO[11]	High ambient option (40°C)
		ELR[5]	Emergency battery pack with remote test switch. 10W Constant Power, Not Certified in CA Title 20 MAEDBS	CP[12]	Chicago Plenum
		ELSD[5]	Emergency battery pack with self-diagnostics, 10W Constant Power, integral test switch. Not Certified in CA Title 20 MAEDBS	RRL__	RELOC®-ready luminaire connectors enable a simple and consistent factory installed option across all ABL luminaire brands. Refer to RRL for complete nomenclature. Available only in RRLA, RRLB, RRLAE, and RRLC12S.
		ELRSD[5]	Emergency battery pack with self-diagnostics, 10W Constant Power, remote test switch. Not Certified in CA Title 20 MAEDBS	NLTAIR2[8,9]	nLight® Air enabled
		E10WCP[5]	Emergency battery pack, 10W Constant Power with integral test switch. Certified in CA Title 20 MAEDBS	NLTAIRER2[9,10]	nLight® AIR Dimming Pack Wireless Controls. Controls fixtures on emergency circuit, not available with battery pack options
		E10WCPR[5]	Emergency battery pack, 10W Constant Power with remote test switch. Certified in CA Title 20 MAEDBS	USPOM	US point of manufacture
		NPP16D[7,10]	nLight® network power/relay pack with 0-10V dimming for non-eldoLED drivers (GZ10, GZ1).	90CRI	High CRI (90+)
		NPP16DER[7,10]	nLight® network power/relay pack with 0-10V dimming for non-eldoLED drivers (GZ10, GZ1). ER controls fixtures on emergency circuit.		

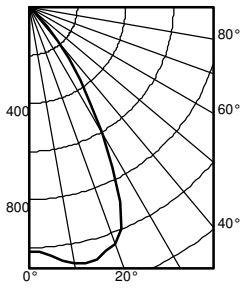
Notes

1 Overall height varies based on lumen package; refer to dimensional chart on page 3.
2 Not available with finishes.
3 Not available with emergency options.
4 Must specify voltage 120V or 277V.
5 12.5" of plenum depth or top access required for battery pack maintenance.
6 Available with clear (AR) reflector only.
7 Specify voltage. ER for use with generator supply EM power. Will require an emergency hot feed and normal hot feed.
8 Fixture begins at 80% light level. Must be specified with NPS80EZ or NPS80EZ ER. Only available with EZ10 and EZ1 drivers.
9 Not available with CP, NPS80EZ, NPS80EZER, NPP16D, NPP16DER or N80 options.
10 NLTAIR2 and NLTAIRER2 not recommended for metal ceiling installations.
11 Fixture height is 5-11/16" for all lumen packages with HAO.
12 Must specify voltage for 3000lm. Not available with emergency battery pack option.

PHOTOMETRY

Distribution Curve	Distribution Data	Output Data	Coefficient of Utilization	Illuminance Data at 30″ Above Floor for a Single Luminaire

LDN4 35/10 LO4AR, input watts: 10.58, delivered lumens: 1085.2, LM/W = 102.57, spacing criterion at 0= 1.04, test no. ISF 30712P229.



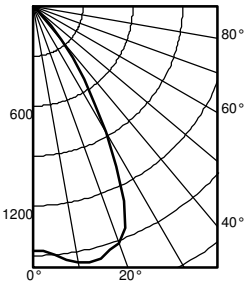
	Ave	Lumens
0	1017	
5	1039	101
15	1084	304
25	895	395
35	369	232
45	52	51
55	1	2
65	1	1
75	0	0
85	0	0
90	0	

Zone	Lumens	% Lamp
0° - 30°	799.7	73.7
0° - 40°	1031.5	95.1
0° - 60°	1084.7	100.0
0° - 90°	1085.2	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	1085.2	*100.0
*Efficiency		

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	33.6	5.8	16.8	8.9	3.4
10.0	18.1	7.9	9.0	12.2	1.8
12.0	11.3	10.0	5.6	15.4	1.1
14.0	7.7	12.1	3.8	18.6	0.8
16.0	5.6	14.2	2.8	21.9	0.6

LDN4 35/15 LO4AR, input watts: 17.5, delivered lumens: 1570.1, LM/W = 89.72, spacing criterion at 0= 1.04, test no. ISF 30712P234.



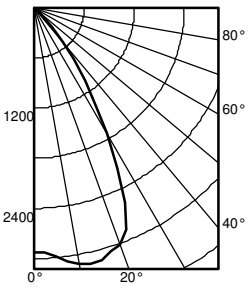
	Ave	Lumens
0	1472	
5	1503	146
15	1569	440
25	1295	571
35	534	335
45	75	74
55	1	3
65	1	1
75	0	0
85	0	0
90	0	

Zone	Lumens	% Lamp
0° - 30°	1157.1	73.7
0° - 40°	1492.5	95.1
0° - 60°	1569.4	100.0
0° - 90°	1570.1	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	1570.1	*100.0
*Efficiency		

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	48.7	5.8	24.3	8.9	4.9
10.0	26.2	7.9	13.1	12.2	2.6
12.0	16.3	10.0	8.2	15.4	1.6
14.0	11.1	12.1	5.6	18.6	1.1
16.0	8.1	14.2	4.0	21.9	0.8

LDN4 35/30 LO4AR, input watts: 32.1, delivered lumens: 3122.6, LM/W = 88.52, spacing criterion at 0= 1.04, test no. ISF 30712P249.



	Ave	Lumens
0	2927	
5	2989	290
15	3120	875
25	2575	1136
35	1062	667
45	149	148
55	3	5
65	2	1
75	0	0
85	0	0
90	0	

Zone	Lumens	% Lamp
0° - 30°	2301.2	73.7
0° - 40°	2968.2	95.1
0° - 60°	3121.1	100.0
0° - 90°	3122.6	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	3122.6	*100.0
*Efficiency		

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	96.8	5.8	48.4	8.9	9.7
10.0	52.0	7.9	26.0	12.2	5.2
12.0	32.4	10.0	16.2	15.4	3.2
14.0	22.1	12.1	11.1	18.6	2.2
16.0	16.1	14.2	8.0	21.9	1.6

Accessories: *Order as separate catalog numbers (shipped separately).*

SCA4	Sloped ceiling adapter. Degree of slope must be specified (5D, 10D, 15D, 20D, 25D, 30D). Refer to TECH-190.

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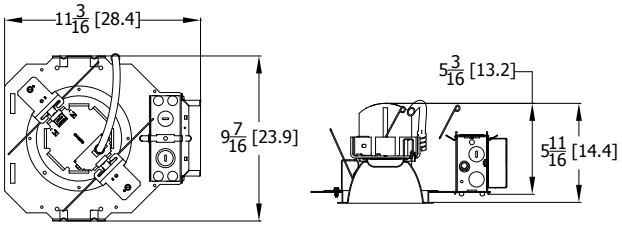
LDN4

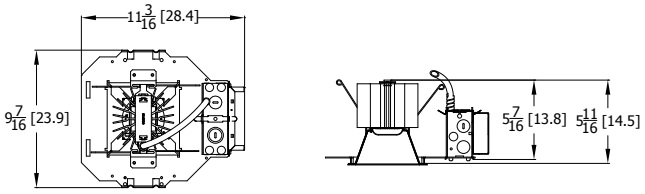
* All dimensions are inches (centimeters) unless otherwise noted.

LDN4 500-1500 LUMEN



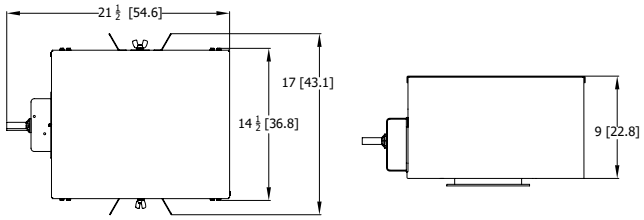
Aperture: 4-5/16 (11)
Ceiling Opening: 5-1/8 (13)
Overlap trim: 5-7/16 (13.8)

LDN4 2000-3000 LUMEN



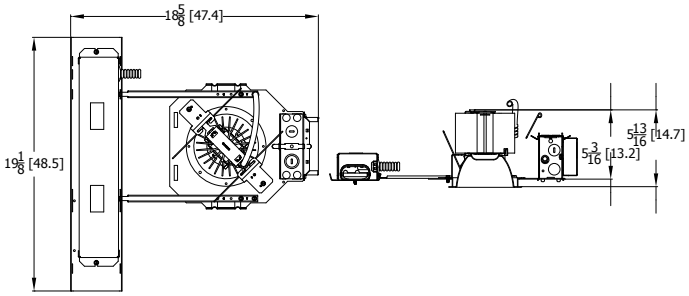
Aperture: 4-5/16 (11) Square
Ceiling Opening: 5-1/8 (13) Square
Overlap trim: 5-7/16 (13.8) Square

LDN4 CP



Aperture: 4-5/16? (11)
Ceiling Opening: 5-1/8? (13)
Overlap trim: 5-7/16? (13.8)

LDN4 EL-ELR



Aperture: 4-5/16 (11)
Ceiling Opening: 5-1/8 (13)
Overlap trim: 5-7/16 (13.8)

LDN4			
Nominal	**Lumens**	**Wattage**	**Lm/W**
500	523.6	5.74	91.2
750	751.1	8.6	87.3
1000	1045	10.58	98.8
1500	1512	17.5	86.4
2000	2006	22.12	90.7
2500	2551	26.1	97.7
3000	3007	32.1	93.7
4000	4212	43	98.0

LUMEN OUTPUT MULTIPLIERS - CCT					
	2700K	**3000K**	**3500K**	**4000K**	**5000K**
80CRI	0.950	0.966	1.000	1.025	1.101

HOW TO ESTIMATE DELIVERED LUMENS IN EMERGENCY MODE

Use the formula below to estimate the delivered lumens in emergency mode

Delivered Lumens = 1.25 x P x LPW

P = Ouput power of emergency driver. P = 10W for PS1055CP

LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet.
The LPW rating is also available at Designlight Consortium.

LUMEN OUTPUT MULTIPLIERS - FINISH			
	Clear (AR)	**White (WR)**	**Black (BR)**
Specular (LS)	1.0	N/A	N/A
Semi-specular (LSS)	0.950	N/A	N/A
Matte diffuse (LD)	0.85	N/A	N/A
Painted	N/A	0.87	0.73

Notes

- Tested in accordance with IESNA LM-79-08.
- Tested to current IES and NEMA standards under stabilized laboratory conditions.
- CRI: 80 typical.

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ADDITIONAL DATA

COMPATIBLE 0-10V WALL-MOUNT DIMMERS		
MANUFACTURER	PART NO.	POWER BOOSTER AVAILABLE
Lutron®	Diva® DVTV	
	Diva® DVSCTV	
	Nova T® NTFTV	
	Nova® NFTV	
Leviton®	AWSMT-7DW	CN100
	AWSMG-7DW	PE300
	AMRMG-7DW	
	Leviton Centura Fluorescent Control System	
	IllumaTech® IP7 Series	
Synergy®	ISD BC	RDMFC
	SLD LPCS	
	Digital Equinox (DEQ BC)	
Douglas Lighting Controls	WPC-5721	
Entertainment Technology	Tap Glide TG600FAM120 (120V)	
	Tap Glide Heatsink TGH1500FAM120 (120V)	
	Oasis 0A2000FAMU	
Honeywell	EL7315A1019	EL7305A1010 (optional)
	EL7315A1009	
HUNT Dimming	Preset slide: PS-010-IV and PS-010-WH	
	Preset slide: PS-010-3W-IV and PS-010-3W-WH	
	Preset slide, controls FD-010: PS-IFC-010-IV and PS-IFC-010-WH-120/277V	
	Preset slide, controls FD-010: PS-IFC-010-3W-IV and PS-IFC-010-3W-WH-120/277V	
	Remote mounted unit: FD-010	
Lehigh Electronic Products	Solitaire	PBX
PDM Electrical Products	WPC-5721	
Starfield Controls	TR61 with DALI interface port	RT03 DALInet Router
WattStopper®	LS-4 used with LCD-101 and LCD-103	

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a shaded background*
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

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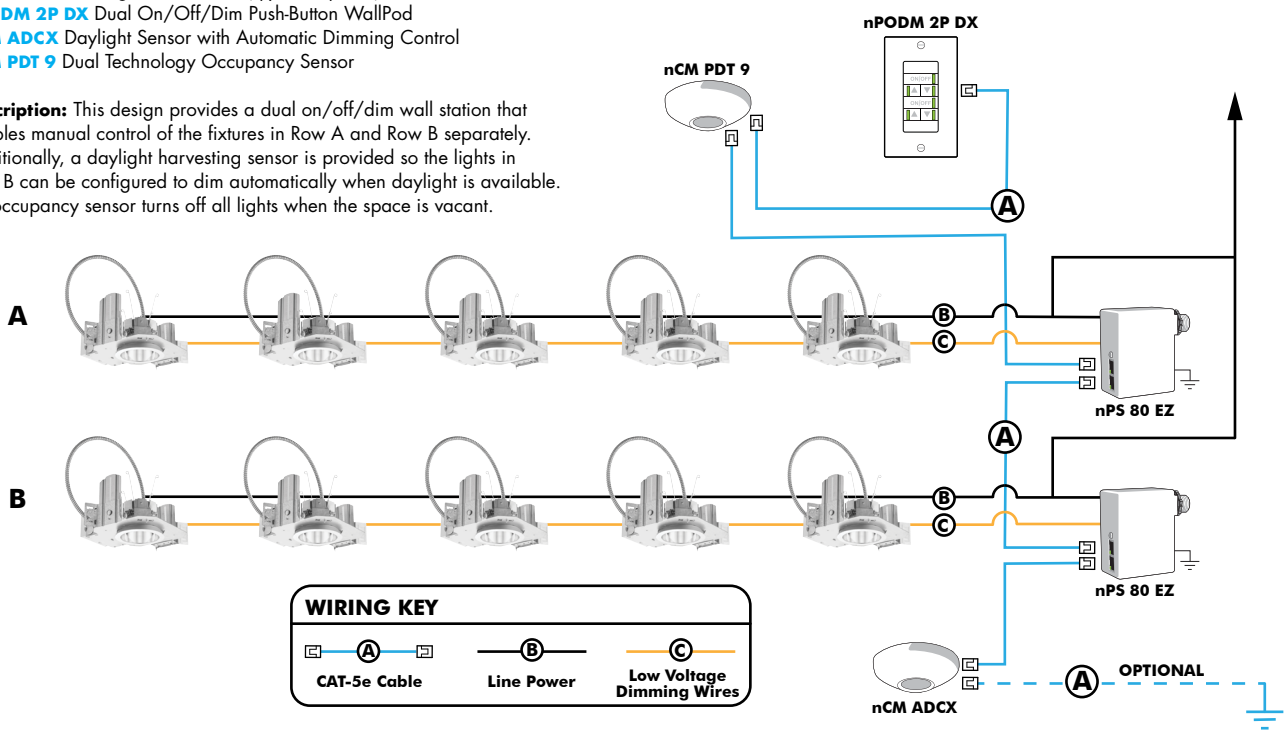
EXAMPLE
Group Fixture Control*
*Appiication diagram applies for fixtures with eldoLED drivers only.

nPS 80 EZ Dimming/Control Pack (qty: 2 required)
nPODM 2P DX Dual On/Off/Dim Push-Button WallPod
nCM ADCX Daylight Sensor with Automatic Dimming Control
nCM PDT 9 Dual Technology Occupancy Sensor

Description: This design provides a dual on/off/dim wall station that enables manual control of the fixtures in Row A and Row B separately. Additionally, a daylight harvesting sensor is provided so the lights in Row B can be configured to dim automatically when daylight is available. An occupancy sensor turns off all lights when the space is vacant.



Choose Wall Controls
nLight offers multiple styles of wall controls - each with varying features and user experience.



Push-Button Wallpod
Traditional tactile buttons and LED user feedback



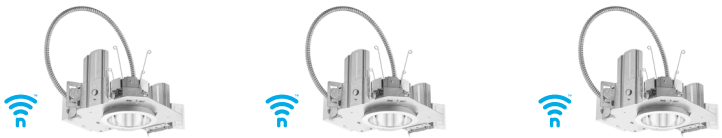
Graphic Wallpod
Full color touch screen provides a sophisticated look and feel

nLight® Wired Controls Accessories:			
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight for complete listing of nLight controls.			
WallPod Stations	**Model number**	**Occupancy sensors**	**Model Number**
On/Off	nPODM (Color)	Small motion 360º, ceiling (PIR/dual Tech)	nCM 9 / nCM PDT 9
On/Off & Raise/Lower	nPOD DX (Color)	Large motion 360º, ceiling (PIR/dual tech)	nCM 10 / nCM PDT 10
Graphic Touchscreen	nPOD GFX (Color)	Wide View (PIR/dual tech)	nWV 16 / nWV PDT 16
Photocell controls	**Model Number**	Wall Switch w/ Raise/Lower (PIR/dual tech)	nWSX LV DX / nWSX PDT LV DX
Dimming	nCM ADCX	**Cat-5 cables (plenum rated)**	**Model Number**
		10', CAT5 10FT	CAT5 10FT J1
		15, CAT5 15FT	CAT5 15FT J1

nLight® AIR Control Accessories: *Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair.*	
Wall switches	**Model number**
On/Off single pole	rPODB [color]
On/Off two pole	rPODB 2P [color]
On/Off & raise/lower single pole	rPODB DX [color]
On/Off & raise/lower two pole	rPODB 2P DX [color]
On/Off & raise/lower single pole	rPODBZ DX WH[1]

Notes
1 Can only be ordered with the RES7Z zone control sensor version.

nLight AIR
nLight AIR is the ideal solution for retrofit or new construction spaces where adding communication is cost prohibitive. The integrated nLight AIR rPP20 Power Pack is part of each Lithonia LDN Luminaire. These individually addressable controls offer the ultimate in flexibility during initial setup and for space repurposing.



Simple as 1,2,3

1. Install the nLight® AIR fixtures with embedded smart sensor
2. Install the wireless battery-powered wall switch
3. With CLAIRITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome



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JOB _____ TYPE _____

NOTES _____ APPROVALS _____

FEATURES

- 20" size in post top, pole and wall mount
- High performance optics up to 17,000 delivered lumens
- Elegant form factor
- Diffusion lens option
- SiteSync™ wireless control options

CERTIFICATIONS

c UL us LISTED

ida DARK SKY APPROVED 2016

DLC OPEL LISTED

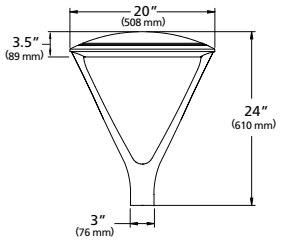
3000K and warmer CCTs only

SPECIFICATIONS



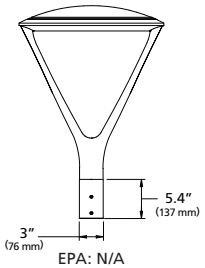
Weight: 35 lbs

FM33



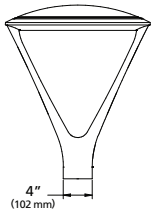
EPA: .512

PT23



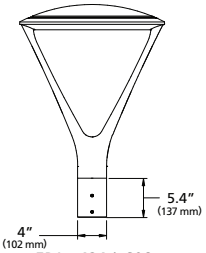
EPA: N/A

FM44



EPA: .534

PT24 / PT34



EPA: .424 / .608

ORDERING CODE

Series	LED Engine	CCT	Distribution	Rotation	Voltage	Mounting
UR20 Ouro	No Lens or Clear Lens	**AM** Amber	No Lens or Clear Lens	Blank for no rotation	**UNV** 120-277V	**FM33** Flush mt 3.0" OD pole, 3" fixture base
	24L-25 3,000 lm	**3K7** 3000K, 70 CRI	**FR** Type 1/Front Row	**L**[1] Optic rotation left	**347** 347V	**FM44** Flush mt 3.6" to 4.0" OD pole, 4" fixture base
	24L-65 7,000 lm	**3K8** 3000K, 80 CRI	**2** Type II	**R**[1] Optic rotation right	**480** 480V	**PT23** 3" Post Top mount for 2 3/8" OD Tenon
	56L-75 10,000 lm	**3K9** 3000K, 90 CRI	**3** Type III		**DALI** 120-277V†	**PT24** 4" Post Top mount for 2 3/8" OD Tenon
	56L-110 15,000 lm	**4K7** 4000K, 70 CRI	**4** Type IV		†Consult factory	**PT34** 4" Post Top mount for 2 7/8" OD Tenon
	56L-140 17,000 lm	**4K8** 4000K, 80 CRI	**4W** Type IV Wide			
	HDL - High Diffusion Lens	**5K7** 5000K, 70 CRI	**5QM** Type V Square Medium			
	28L-30 3,000 lm		**5QN** Type V Square Narrow			
	28L-70 7,000 lm		**5R** Type V Rectangular			
	68L-80 9,000 lm		**5W** Type V Wide (Round)			
	68L-115 13,000 lm		HDL - High Diffusion Lens			
	68L-150 15,000 lm		**3** Type III/Asymmetric			
			5W Type V/Symmetric			

Fixture Finish	Control Options		Options	Control Accessories^
BL Black	**7PR-TL** 7 pin PCR with twist lock photocontrol	**SWPM-40F**[2,3,4,5] SiteSync with Sensor 9' to 40' MH	**BC**[6] Back-light Control	**SW7PR**[2,3] SiteSync with 7 pin PCR
DB Dark Bronze	**7PR-SC** 7 pin PCR with shorting cap	**WSP-40F-1**[2,5] Dimming Occ. Sensor for up to 40' MH, 120/277/347V	**SF** Single Fuse	**SWUSB** SiteSync Software on USB
LG Light Gray	**7PR** 7 pin PCR, wireless control enabled	**WSP-40F-2**[2,5] Dimming Occ. Sensor for up to 40' MH, 208/240V	**DF** Double Fuse	**SWTAB** SiteSync Windows® Tablet
GT Graphite	**AD-01**[2] AstroDIM: 50% output at midnight	**WSP-40F-3**[2,5] Dimming Occ. Sensor for up to 40' MH, 480V	**TB** Terminal Block	**SWBRG** SiteSync Wireless Bridge Node
PS Platinum Silver	**AD-02**[2] AstroDIM: 50% output midnight to 4 AM	**NXSPW14F**[2,5] NX Wireless, PIR Sensor, 14'	**CLR**[5] Clear Lens	**WIR-RME-L** wiSCAPE External Fixture Module
TT Titanium	**AD-03**[2] AstroDIM: 50% output 10PM	**NXSPW30F**[2,5] NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'.	**TL** Tamper proof latch	**SCL-R** Occ. Sensor for Round Pole (up to 16' MH)
WH White	**AD-04**[2] AstroDIM: 50% output 10PM to 4AM	**NXSP14F**[2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14'		**SCL -S** Occ. Sensor for Square Pole (up to 16' MH)
CC Custom Color†	**NXWE** NX Wireless Enabled	**NXSP30F**[2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'		**SCH-R** Occ. Sensor for Round Pole (16' to 30' MH)
†Consult factory	**SWP**[2,3,4] SiteSync Pre commission			**SCH-S** Occ. Sensor for Square Pole (16' to 30' MH)
				NXOFM-1R1D-UNV NX 7-pin Module
				^ Please refer to page 8 for ordering details

1 Not available with 5QM, 5QN, and 5W distributions.
2 Not available with other sensor or wireless control options.
3 Specify group and zone at time of order. See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node.
4 Not available with 347V and 480V
5 24L & 56L only.
6 Not available with Type V distributions or HDL option.

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Kim Lighting reserves the right to change specifications without notice.

LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
24L	3,000	25	No Lens	FR	2932	0	0	1	115	3119	0	0	1	123	3098	0	0	1	124
				FR-BC	1994	0	0	0	78	2121	0	0	0	83	2107	0	0	0	83
				2	2943	1	0	1	116	3099	1	0	1	122	3110	1	0	1	124
				2-BC	1724	0	0	1	68	1834	0	0	1	72	1822	0	0	1	72
				3	3007	1	0	1	118	3200	1	0	1	126	3178	1	0	1	127
				3-BC	1830	0	0	1	73	1947	0	0	1	78	1934	0	0	1	77
				4	3056	0	0	1	120	3251	0	0	1	128	3229	0	0	1	129
				4-BC	2235	0	0	1	88	2377	0	0	1	93	2362	0	0	1	93
				4W	3078	1	0	2	121	3276	1	0	2	129	3253	1	0	2	130
				4W-BC	1855	0	0	1	73	1975	0	0	1	78	1961	0	0	1	77
				5QM	2931	2	0	1	115	3119	2	0	1	123	3098	2	0	1	124
				5QN	2694	2	0	1	106	2866	2	0	1	113	2847	2	0	1	114
				5R	3054	2	0	2	120	3250	2	0	2	128	3228	2	0	2	129
				5W	3043	2	0	1	120	3237	2	0	1	127	3216	2	0	1	129
			Clear Lens	FR	2773	0	0	1	109	2951	0	0	1	116	2930	0	0	1	117
				FR-BC	1886	0	0	1	74	2007	0	0	1	79	1993	0	0	1	78
				2	2784	1	0	1	109	2963	1	0	1	116	2942	1	0	1	118
				2-BC	1631	0	0	1	64	1736	0	0	1	68	1723	0	0	1	67
				3	2845	1	0	1	111	3028	1	0	1	119	3007	1	0	1	120
				3BC	1806	0	0	1	72	1922	0	0	1	77	1909	0	0	1	76
				4	2891	0	0	1	113	3076	0	0	1	120	3055	0	0	1	122
				4-BC	2114	0	0	1	83	2250	0	0	1	88	2234	0	0	1	88
				4W	2912	1	0	1	114	3099	1	0	2	121	3077	1	0	2	123
				4W-BC	1755	0	0	1	69	1868	0	0	1	73	1855	0	0	1	5
				5QM	2773	1	0	1	109	2950	2	0	1	116	2931	2	0	1	117
				5QN	2549	1	0	0	100	2712	2	0	1	106	2693	2	0	1	108
				5R	2890	2	0	2	113	3075	2	0	2	120	3054	2	0	2	122
				5W	2879	2	0	1	113	3064	2	0	1	120	3042	2	0	1	122
28L		30	HDL Lens	3	2816	1	0	1	96	2997	1	0	1	102	3020	1	0	1	101
				5W	2917	1	0	1	100	3105	1	0	1	106	3084	1	0	1	103

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
24L	7,000	65	No Lens	FR	6754	1	0	1	104	7187	1	0	1	111	7138	1	0	1	110
				FR-BC	4392	0	0	1	68	4673	0	0	1	72	4641	0	0	1	71
				2	6571	1	0	2	101	6992	1	0	2	108	6944	1	0	2	107
				2-BC	3799	0	0	1	58	4042	0	0	1	62	4014	0	0	1	62
				3	6625	1	0	2	102	7051	1	0	2	108	7002	1	0	2	108
				3BC	4032	0	0	1	62	4291	0	0	1	66	4261	0	0	1	66
				4	6788	1	0	2	104	7223	1	0	2	111	7174	1	0	2	110
				4-BC	4924	0	0	2	76	5239	0	0	2	81	5203	0	0	2	80
				4W	6699	1	0	2	103	7128	1	0	3	110	7079	1	0	3	109
				4W-BC	4088	0	0	2	63	4350	0	0	2	67	4321	0	0	2	66
				5QM	7025	3	0	1	108	7477	3	0	1	115	7425	3	0	1	114
				5QN	6964	3	0	1	107	7410	3	0	1	114	7323	3	0	1	113
				5R	7038	3	0	3	108	7489	3	0	3	115	7437	3	0	3	114
				5W	7011	3	0	2	108	7460	3	0	2	115	7409	3	0	2	114
			Clear Lens	FR	6432	1	0	1	97	6844	1	0	1	104	6798	1	0	1	105
				FR-BC	4182	0	0	1	63	4450	0	0	1	67	4420	0	0	1	67
				2	6258	1	0	1	95	6659	1	0	2	101	6613	1	0	2	102
				2-BC	3617	0	0	1	55	3849	0	0	1	58	3823	0	0	1	58
				3	6310	1	0	2	96	6714	1	0	2	102	6668	1	0	2	103
				3-BC	3599	0	0	1	55	3829	0	0	1	59	3803	0	0	1	59
				4	6465	1	0	2	98	6879	1	0	2	104	6832	1	0	2	105
				4-BC	4688	0	0	2	71	4990	0	0	2	76	4955	0	0	2	75
				4W	6380	1	0	2	97	6789	1	0	2	103	6742	1	0	2	104
				4W-BC	3893	0	0	2	59	4143	0	0	2	63	4115	0	0	2	62
				5QM	6691	3	0	1	101	7119	3	0	1	108	7070	3	0	1	109
				5QN	6632	2	0	1	100	7058	3	0	1	107	7009	3	0	1	108
				5R	6702	3	0	3	102	7131	3	0	3	108	7082	3	0	3	109
				5W	6676	3	0	2	101	7104	3	0	2	108	7055	3	0	2	109
28L		70	HDL Lens	3	6047	2	0	2	92	6047	2	0	2	92	6236	2	0	2	89
				5W	6221	2	0	1	94	6619	2	0	1	100	6525	2	0	1	93

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	10,000	75	No Lens	FR	9315	1	0	1	124	9913	1	0	1	132	9845	1	0	1	131
				FR-BC	6058	0	0	1	81	6445	0	0	1	86	6402	0	0	1	85
				2	9063	2	0	2	120	9644	2	0	2	128	9578	2	0	2	128
				2-BC	5239	0	0	1	70	5575	0	0	1	74	5536	0	0	1	74
				3	9139	2	0	2	125	9725	2	0	2	134	9657	2	0	2	129
				3-BC	5561	0	0	2	74	5877	0	0	2	78	5561	0	0	2	74
				4	9362	1	0	2	124	9362	1	0	2	124	9876	1	0	2	132
				4-BC	6791	0	0	2	90	7226	0	0	2	96	7168	0	0	2	96
				4W	9240	2	0	3	123	9832	2	0	3	131	9765	2	0	3	130
				4W-BC	5639	0	0	2	75	6001	0	0	2	80	5959	0	0	2	79
				5QM	9691	3	0	1	129	10312	3	0	1	137	10240	3	0	1	137
				5QN	9606	3	0	1	128	10222	3	0	1	136	10151	3	0	1	135
				5R	9706	3	0	3	129	10328	3	0	3	137	10258	3	0	3	137
				5W	9669	4	0	2	129	10289	4	0	2	137	10217	4	0	2	136
			Clear Lens	FR	8871	1	0	1	117	9760	1	0	1	129	9374	1	0	1	125
				FR-BC	5769	0	0	1	76	6138	0	0	1	81	6096	0	0	1	81
				2	8631	2	0	2	114	9183	2	0	2	121	9121	2	0	2	122
				2-BC	4989	0	0	1	67	5309	0	0	1	71	5272	0	0	1	62
				3	8703	1	0	2	115	9260	2	0	2	122	9197	2	0	2	123
				3-BC	4964	1	0	1	66	5282	1	0	2	70	5245	1	0	2	69
				4	8916	1	0	2	118	9487	1	0	2	125	9423	1	0	2	126
				4-BC	6467	0	0	2	85	6881	0	0	2	91	6834	0	0	2	90
				4W	8799	2	0	3	116	9363	2	0	3	124	9300	2	0	3	124
				4W-BC	5370	0	0	2	72	5714	1	0	2	76	5675	0	0	2	76
				5QM	9228	3	0	1	122	9820	3	0	1	130	9752	3	0	1	130
				5QN	9147	3	0	1	121	9734	3	0	1	129	9668	3	0	1	129
				5R	9244	3	0	3	122	9836	3	0	3	130	9769	3	0	3	130
				5W	9208	4	0	2	122	9798	4	0	2	130	9732	4	0	2	130
68L		80	HD Lens	3	7853	2	0	2	99	8356	2	0	2	106	8299	2	0	2	104
				5W	8080	2	0	2	102	8684	3	0	2	110	8684	3	0	2	109

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	15,000	110	No Lens	FR	13533	1	0	1	125	14399	1	0	2	133	14301	1	0	2	130
				FR-BC	8799	1	0	1	81	9363	1	0	1	86	9300	1	0	1	85
				2	13165	2	0	2	121	14009	2	0	2	129	13913	2	0	2	126
				2-BC	7611	1	0	2	70	8098	1	0	2	75	8042	1	0	2	74
				3	13275	2	0	3	122	14126	2	0	3	130	14030	2	0	3	128
				3-BC	8079	1	0	2	73	8596	1	0	2	78	8538	1	0	2	78
				4	13601	1	0	3	125	14472	1	0	3	133	14373	1	0	3	131
				4-BC	9865	1	0	2	91	10497	1	0	3	97	10425	1	0	3	96
				4W	13422	2	0	3	124	14283	2	0	3	132	14185	2	0	3	129
				4W-BC	8191	1	0	3	75	8715	1	0	3	80	8656	1	0	3	80
				5QM	14077	4	0	2	130	14979	4	0	2	138	14876	4	0	2	135
				5QN	13953	4	0	1	129	14848	4	0	1	137	14747	4	0	1	134
				5R	14100	4	0	4	130	15004	4	0	4	138	14901	4	0	4	135
				5W	14046	4	0	2	129	14946	4	0	2	138	14844	4	0	3	135
			Clear Lens	FR	12803	1	0	1	118	13624	1	0	1	126	13531	1	0	1	123
				FR-BC	9298	1	0	1	86	8325	1	0	1	77	8798	1	0	1	81
				2	12455	2	0	2	115	13254	2	0	2	123	13164	2	0	2	120
				2-BC	7200	1	0	1	67	7661	1	0	2	71	7610	1	0	2	70
				3	12560	2	0	3	116	13365	2	0	3	124	13273	2	0	3	121
				3-BC	7163	1	0	2	65	7622	1	0	2	69	7570	1	0	2	69
				4	12868	1	0	3	119	13692	1	0	3	127	13599	1	0	3	124
				4-BC	9333	1	0	2	86	9931	1	0	2	92	9864	1	0	2	90
				4W	12699	2	0	3	117	13513	2	0	3	125	13420	2	0	3	122
				4W-BC	7750	1	0	3	72	8246	1	0	3	76	8190	1	0	3	76
				5QM	13318	3	0	2	123	14172	4	0	2	131	14075	4	0	2	128
				5QN	13202	3	0	1	122	14048	4	0	1	130	13951	4	0	1	127
				5R	13341	4	0	4	123	14195	4	0	4	131	14099	4	0	4	128
				5W	13290	4	0	2	123	14141	4	0	2	131	14044	4	0	2	128
68L		115	HD Lens	3	11577	2	0	2	102	12320	2	0	2	109	12236	2	0	2	106
				5W	11912	3	0	2	105	12676	3	0	2	112	12588	3	0	2	109

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	17,000	140	No Lens	FR	15323	2	0	2	111	16306	2	0	2	118	16194	2	0	2	116
				FR-BC	9964	1	0	1	72	10603	1	0	1	77	10530	1	0	1	76
				2	14897	2	0	2	108	15852	2	0	2	115	15743	2	0	2	112
				2-BC	8618	1	0	2	63	9169	1	0	2	67	9107	1	0	2	66
				3	15032	2	0	3	109	15996	2	0	3	116	15886	2	0	3	113
				3-BC	9147	1	0	2	65	9733	1	0	2	70	9667	1	0	2	69
				4	15400	1	0	3	112	16387	1	0	4	119	16275	1	0	4	116
				4-BC	11170	1	0	3	81	11886	1	0	3	86	11804	1	0	3	86
				4W	15198	2	0	4	110	16173	3	0	4	117	16062	3	0	4	115
				4W-BC	9275	1	0	3	67	9869	1	0	3	72	9801	1	0	3	71
				5QM	15939	4	0	2	116	16962	4	0	2	123	16845	4	0	2	120
				5QN	15801	4	0	1	115	16813	4	0	1	122	16698	4	0	1	119
				5R	15966	4	0	4	116	16990	4	0	4	123	16874	4	0	4	121
				5W	15906	4	0	3	115	16925	4	0	3	123	16808	4	0	3	120
			Clear Lens	FR	14541	1	0	2	105	15473	2	0	2	111	15367	2	0	2	110
				FR-BC	9456	1	0	1	68	10061	1	0	1	72	9993	1	0	1	72
				2	14146	2	0	2	102	15053	2	0	2	108	14950	2	0	2	107
				2-BC	8178	1	0	2	59	8702	1	0	2	63	8642	1	0	2	62
				3	14265	2	0	3	103	15179	2	0	3	109	15076	2	0	3	108
				3BC	8136	1	0	2	58	8657	1	0	2	62	8598	1	0	2	61
				4	14614	1	0	3	105	15551	1	0	3	112	15445	1	0	3	110
				4-BC	10600	1	0	3	76	11279	1	0	3	81	11203	1	0	3	81
				4W	14423	2	0	3	104	15347	2	0	4	111	15243	2	0	4	109
				4W-BC	8802	1	0	3	63	9365	1	0	3	67	9302	1	0	3	67
				5QM	15126	4	0	2	109	16095	4	0	2	116	15985	4	0	2	114
				5QN	14994	4	0	1	108	15955	4	0	1	115	15846	4	0	1	113
				5R	15152	4	0	4	109	16122	4	0	4	116	16012	4	0	4	114
				5W	15094	4	0	3	109	16061	4	0	3	116	15951	4	0	3	114
68L		115	HD Lens	3	13240	2	0	2	89	13992	3	0	3	95	13897	3	0	3	93
				5W	13623	3	0	2	92	14396	3	0	2	97	14298	3	0	2	95

Electrical Characteristics												Dimming				
System Watts	Drive Current	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming Range	Source current out		Absolute voltage	
		VAC	Hz	120	208	240	277	347	480				Min	Max	Min	Max
25	298mA	120-480	50/60	0.21	0.12	0.10	0.09	0.07	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
30	298mA			0.25	0.14	0.13	0.11	0.09	0.06							
65	800mA			0.54	0.31	0.27	0.23	0.19	0.14							
70	700mA			0.58	0.34	0.29	0.25	0.20	0.15							
75	420mA			0.63	0.36	0.31	0.27	0.22	0.16							
80	350mA			0.67	0.38	0.33	0.29	0.23	0.17							
110	600mA			0.92	0.53	0.46	0.40	0.32	0.23							
115	500mA			0.96	0.55	0.48	0.42	0.33	0.24							
140	750mA			1.17	0.67	0.58	0.51	0.40	0.29							
150	625mA			1.25	0.72	0.63	0.54	0.43	0.31							

TM-21 LIFETIME CALCULATION

Projected Lumen Maintenance (25°C / 77°F)						
HOURS	0	25,000	36,000	50,000	100,000	Reported L70
Projected Lumen Maintenance	100%	97%	95%	93%	87%	> 60,000 hrs

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SPECIFICATIONS

Housing:

- Low copper aluminum alloy die-casting is designed as one-piece with internal cooling fins.
- Solid, cast aluminum wall creates a thermal barrier between the optical and electrical compartments.
- Molded silicone gasket throughout insures the sealing between the two compartments and provides ingress protection.
- Housing is designed with integral LED heat sink utilized for thermal transfer and for securing the location of each LED module.
- IK09 rated enclosure protects electrical equipment against external mechanical impacts.

Lens Frame:

- One-piece low copper aluminum alloy die-cast is secured to housing with 6 screws.

Backlight Control

- Optional Backlight Control on each LED module to completely control unwanted backlight.

Lens

One-piece flat glass lens slips secure with clips. Extra silicone gasketing is provided to retain a clear optical compartment.

Optical Module:

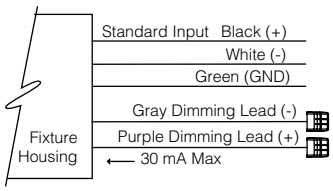
- LEDs shall be mounted to a metal printed circuit board assembly (MCPCB).
- Optical lenses shall be clear injection molded PMMA acrylic.
- Each MCPCB and optic shall be sealed to the diecast housing and sealed with a continuous one piece injection molded silicone rubber gasket.
- Patent Pending design of optical array shall independently shield each LED optic across the length of the aperture.
- Optional fixture finish optical surfaces shall not exceed BUG ratings of the standard white finish and shall be greater than or equal to the delivered lumens of the optional matte black optical surface finish.

Electrical Components

- Standard programmable driver allows for programmable drive current settings.
- Electrical components are stategically located in the driver gear compartment with a molded silicon grommet seal to provide separation from the optical chamber.
- Maximum lightning surge current 20KA with thermally protected varistor technology. Surge suppression is series circuited preventing total fixture failure. ANSI/IEEE C62.41 Category C High.
- Open circuit fault will turn off the luminaire in order to protect the sensitive electronics and acts as a signal for maintenance.
- Programmable Driver is rated for -40°C starting.
- "Thermal Shield", primary side, thermister provides protection for the sustainable life of electronic components.

Dimming:

- Dimming range from 100% to 10% through the use of the standard 0-10V interface on the programmable driver.
- Modular wiring harness in the service area provides user access to the dimming circuitry.
- Dimming circuitry compatible with 0-10V, user-defined control devices.
- Optional factory programmed dimming profile.



Fusing:

SF for 120, 277, and 347 Line volts

DF for 208, 240, and 480 Line volts

Hight temperature fuse holders factory installed inside the fixture housing.

Fuse is included.

Finish:

Fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat.

Standard colors include (BLS) Black Gloss Smooth, (BLT) Black Matte Textured, (DBS) Dark Bronze Smooth, (GTT) Graphite Matte Textured, (LGS) Light Gray Smooth, (PSS) Platinum Silver Smooth, (VGS) Verde Green Smooth, (WHS) White Gloss Smooth, and (CC) Custom Color (Include RAL#).

Certifications and Listings:

- IUL 1598 Standard for Luminaires.
- IUL 8750 Standard for Safety for Light
- IEmitting Diode (LED) Equipment for use in Lighting Products.
- ICSA C22.2#250.0 Luminaires.
- ANSI C136.31-2010 Vibration tested and compliant 1.5G and 4G reference page 9
- IRoHS compliant.
- IIP66 rated.
- IIEC 66262 Mechanical Impact Code IK09.
- IDA approved, 3000K and warmer CCTs only.

CAUTION:

Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

WARRANTY:

For full warranty see: http://www.hubbelllighting.com/resources/warranty

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CONTROLS

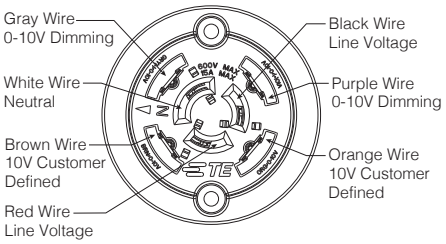
Photocell Receptacle

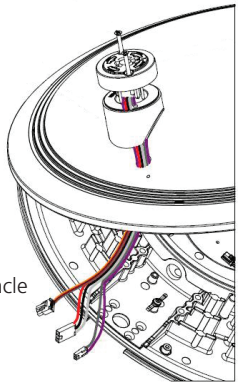
7PR

Fully gasketed and wired 7-pin receptacle option. Easy access location above the electrical compartment. 7-pin construction allows for a user-defined interface and provides a controlled definition of operational performance. ANSI twist-lock control module by-others.

Standard customer operation modes:

1. Traditional on/off photoelectric control.
2. 5-pin wireless photoelectric control for added dimming feature.
3. 7-pin wireless photoelectric control for dimming and additional I/O connections for customer use.





7-Pin receptacle placement

Wireless Controls

wiSCAPE™

Hubbell Control Solution's wiSCAPE™ wireless control modules allow an individual fixture to managed, monitored and measured. The modules communicate securely over a robust certified meshed radio signal. The wiSCAPE modules provide on/off/dim control, external device input, alerts and metering.

WIR-RME-L

wiSCAPE External Module,120-480V, 1000ft range (LOS), Internal Photocell, 1 Digital Input, Compatible with the A-25-7H option

SiteSync™[1]

SiteSync™ wireless control system for reduction in energy and maintenance cost while optimizing light quality 24/7. See ordering information or visit www.hubbelllighting.com/products/sitesync for more details.

Dimming WASP Occupancy Sensor

WSP

The Dimming WASP Outdoor Occupancy Sensor is specifically designed to provide 0-10VDC output for the control of dimmable fixtures. Easy to use dipswitches allow the user to adjust sensor time delay and sensitivity as well as set unoccupied and occupied dimming levels. Sensors also feature a daylight sensor for ON/OFF control of fixtures when there is sufficient natural light. Visit https://hubbellcdn.com/installationmanuals/2102B_Dimming_WASP_Install.pdf for more details.

Pole Mounted

Round Pole-Mounted Occupancy Sensor up to 16'. Select voltage and finish color.

SCL-R

Round Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCL-R44/277[2]/BL[3]

Square Pole-Mounted Occupancy Sensor up to 16'. Select voltage and finish color.

SCL-S

Square Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for square pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCL-L/277[2]/BL[3]

Round Pole-Mounted Occupancy Sensor 16' to 30'. Select voltage and finish color.

SCH-R

Round Pole-Mounted Occupancy Sensor: 16' to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCH-R4[4]/277[2]/BL[3]

Square Pole-Mounted Occupancy Sensor 16' to 30'. Select voltage and finish color.

SCH-S

Square Pole-Mounted Occupancy Sensor: 16 to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCH-S/277[2]/BL[3]

AstroDIM

AstroDIM provides multi-stage night-time power reduction based on an internal timer referenced to the power on/off time. There is no need for an external control infrastructure. The unit automatically performs a dimming profile based on the predefined scheduled reference to the midpoint, which is calculated based on the power on/off times.

[1]PRECOMMISSIONED SITESYNC ORDERING INFORMATION: When ordering a fixture with the SiteSync lighting control option, additional information will be required to complete the order. The SiteSync Commissioning Form or alternate schedule information must be completed. This form includes Project location, Group information, and Operating schedules. For more detailed information please visit www.HubbellLighting.com/products/sitesync or contact Hubbell Lighting tech support at (800) 345-4928.

SiteSync fixtures with occupancy sensor (SWPM) require the mounting height of the fixture for selection of the lens.

Examples:

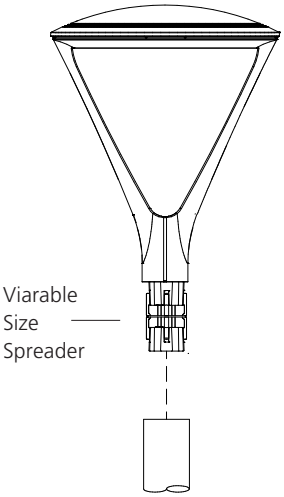
SiteSync only : UR20/56L-75/3K7/UNV/ASQ/BL/SWP

SiteSync with Motion Control: UR20/56L-75/3K7/UNV/ASQ/BL/SWPM-40F

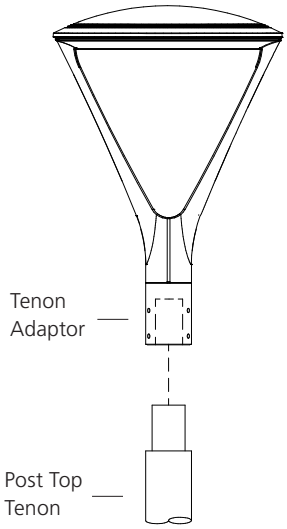
[2]Voltage, [3]Color, [4]Pole Diameter,

Kim Lighting reserves the right to change specifications without notice.

MOUNTING INSTALLATION

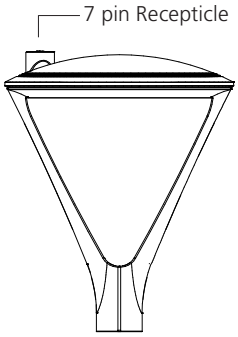


Flush Mount
FM33/44

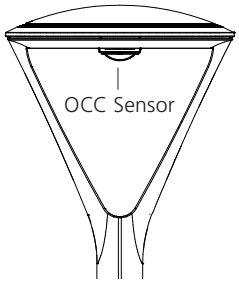


Post Top
PT23/24/34

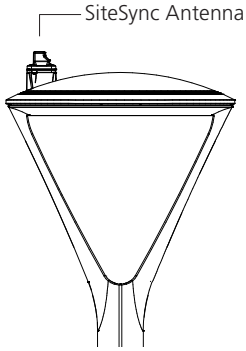
SENSOR PLACEMENT



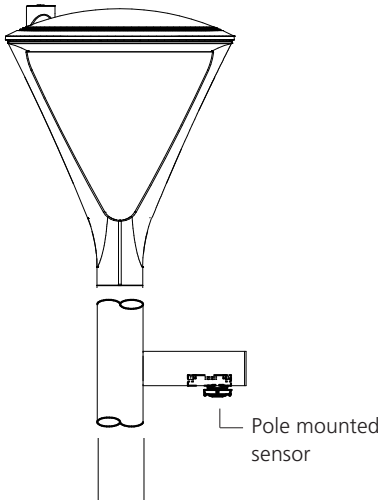
7 pin PCR
7PR



OCC Sensor
NX or WSP



SiteSync
SW7PR



Pole Mounted Sensor
SCL-R, SCL-S, SCH-R,
SCH-S

MOUNTING VIBRATION RATINGS

UR 20 Arm		UR28 Arm		UR 20 Post Top		UR 28 Post Top	
Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating
ASQ	4G	**ASQ**	4G	**FM33**	4G	**FM44**	1.5G
A34	4G	**A34**	4G	**FM44**	1.5G	**FM45**	1.5G
A46	4G	**A46**	4G	**PT23**	4G	**PT24**	1.5G
MAF	4G	**MAF**	4G	**PT24**	4G	**PT34**	1.5G
				PT34	1.5G	**PT25**	1.5G
						PT35	1.5G

For the 4 G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Test Level 1 Normal Applications, Vibration Test Level 2 Bridge/Overpass Applications, and Vibration Test Level 3

For the 1.5G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Level 1 Bridge/Overpass Applications

Kim Lighting reserves the right to change specifications without notice.

DESCRIPTION

The Invue Arbor post top brings architectural style to area/site and pedestrian scale applications. Its dayform appearance brings a desired organic look into the urban environment. WaveStream™ LED Optics provide a uniform pixelation free image, managing glare while providing high levels of visibility.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Two-piece IP66 rated housing is cast from low copper content corrosion resistant aluminum, maintaining strength and precision to sustain long term dayform appearance. ANSI C136.31 testing compliance prevents damage from installation generated vibration. External hardware and casting seams are minimized to enhance appearance.

Optics
Specifically designed for pedestrian applications, WaveStream LED optical waveguide technology produces both symmetric NEMA type V and asymmetric NEMA II, III, IV distributions. The waveguide is manufactured from precision injection molded acrylic resulting in a pixelation free optical image for improved glare control and visual comfort. Luminaire efficacy's measure up to 100 lm/w for 4000K (+/- 275K) CCT at 70 CRI (min), optional 3000K CCT at 80 CRI is also available.

Electrical
LED driver(s) are directly mounted to upper housing thermal pad for optimal thermal performance. Standard 0-10V dimming drivers and Eaton's proprietary surge protection module are designed to withstand 10kV of transient line surge. Drivers operate at 120-277V 50/60Hz with 347V/60Hz or 480V/60Hz operation optional. Suitable for ambient temperature applications as low as -40°C (40°F) to 40°C (104°F). Limited high ambient options allow for 50°C operation.

Controls
The Arbor LED luminaire control options are designed to be simple and cost-effective ASHRAE and California Title 24 compliant solutions. The ANSI C136.41 compliant NEMA 7-PIN receptacle enables wireless dimming when used with compatible photocontrol. An integrated dimming and occupancy sensor is a standalone control option available in on/off (MS) and bi-level dimming (MS/DIM) operation. The optional LumaWatt Pro™ system is best described as a peer-to-peer wireless network of luminaire-integral sensors that operate in accordance with programmable profiles. Each sensor is capable of motion and photo sensing, metering power consumption and wireless communication. See control options page for more details.

Mounting
Fitter assembly mounts over 2-3/8" O.D. tenon and is secured via six concealed stainless steel set screws. Design of fitter provides seamless transition to 3" O.D. round pole top. Additional mounting accessories include a single fixture arm mount, twin fixture arm mount and wall mount arm. Additional pole mount accessories mount to a 3" x 4" long tenon for 4" - 5" O.D. poles tops. For existing 2-3/8" tenons an adapter is shipped standard.

Finish
Eaton utilizes premium ultra-weatherable TGIC based polyester powder coatings that are specifically formulated to withstand extended outdoor exposure. The powders are formulated exclusively for Eaton to serve functionally as well as decorative. Good film appearance combinded with excellent mechanical an exterior exposure qualities display greater than twice as much gloss retention. RAL and custom color matches available. Finish is compliant with ASTM B117 3000hr salt spray standard.

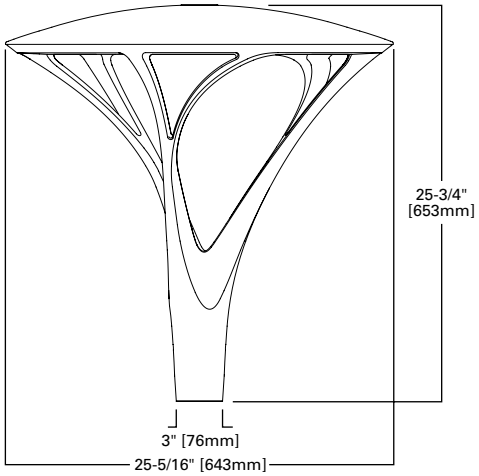
Warranty
Five-year warranty.



ARB ARBOR POSTTOP

DECORATIVE LUMINAIRE

DIMENSIONS



CERTIFICATION DATA

UL/cUL Listed
ANSI C136.31 1.5G Vibration Tested
IEG 60529 IP66 Housing
ASTM B117 SaH Spray Tested
ASTM A3560 Low Cooper Alloy
RoHS
ISO 9001
Dark Sky Approved (3000K CCT and warmer only)

ENERGY DATA

Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V 50/60Hz, 347V/60Hz, 480V/60Hz
40°C Ambient Temperature Rating
As low as -40°C (-40°F) minimum temperature
*See MINIMUM TEMPERATURE table

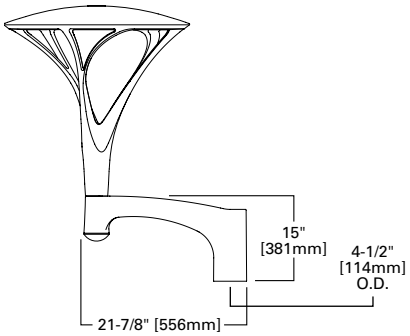
EPA

Effective Projected Area: (Sq. Ft.) 0.9

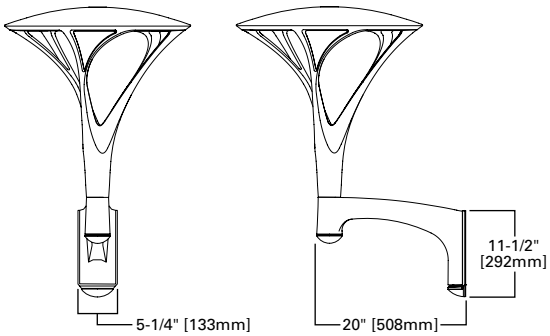
Approximate Net Weight:
37 lbs. [16.8 kgs.]

MOUNTING CONFIGURATIONS (WEIGHT AND EPAS INCLUDES FIXTURE)

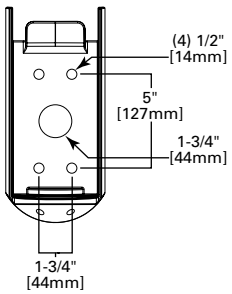
Single Arm Mount (ARSA-XX)
Weight: 56 lbs. [25.45 kgs.]
EPA: 1.7 Sq. Ft.



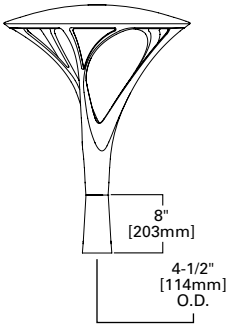
Wall Mount Arm (ARWM-XX)
Weight: 57 lbs. [25.91 kgs.]
EPA: 1.8 Sq. Ft.



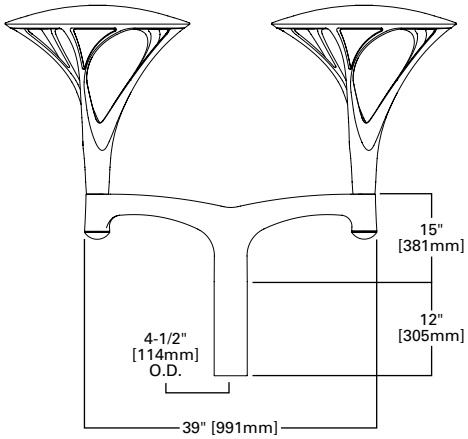
Wall Mount Arm Drill Pattern



Post Top Adapter (ARPA4-XX)
Weight: 41 lbs. [18.63 kgs.]
EPA: 1.2 Sq. Ft.



Twin Arm Mount (ARTA15-XX)
Weight: 114 lbs. [51.81 kgs.]
EPA: 3.45 Sq. Ft.

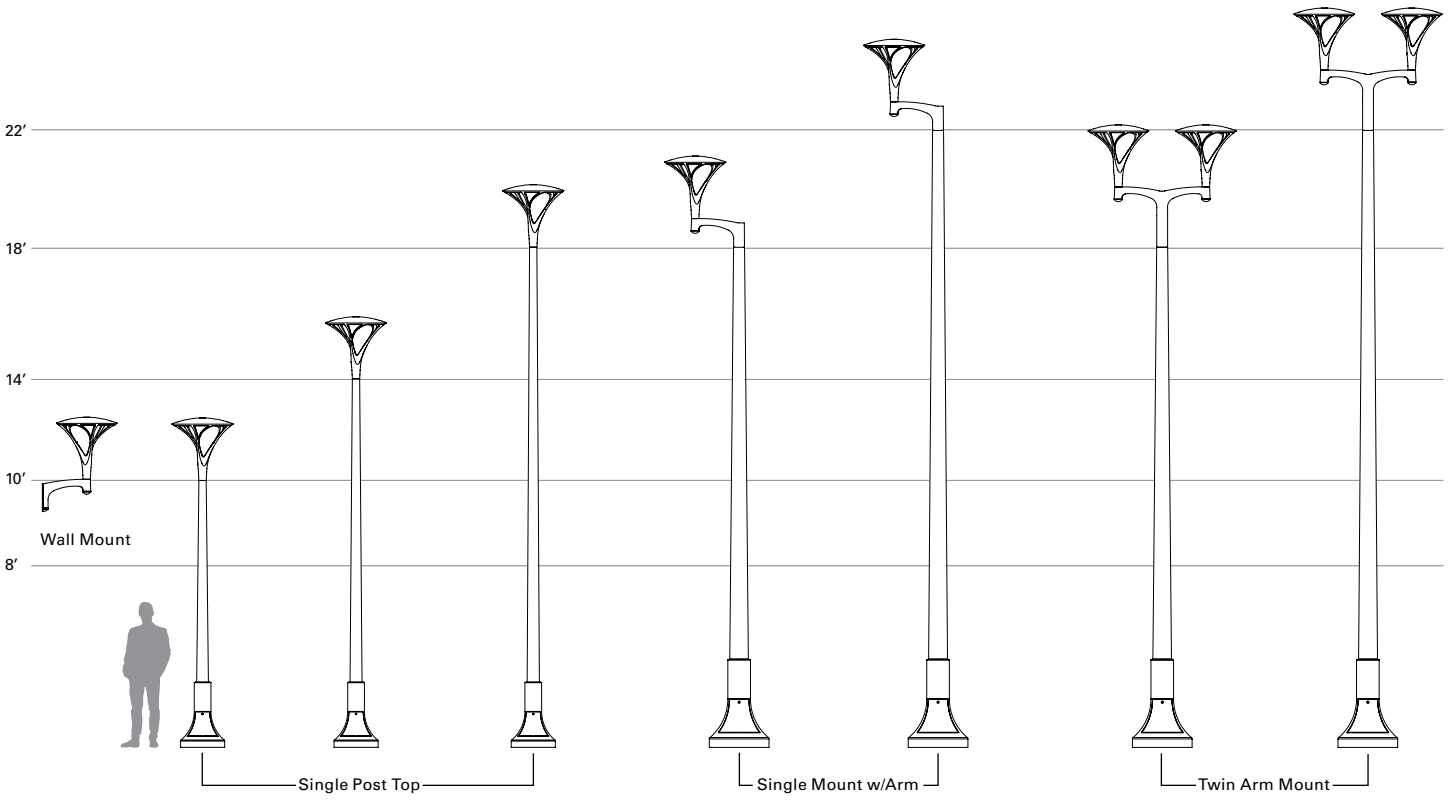


MOUNTING REQUIREMENTS CHART

Tenon O.D. (Inches)	**2-3/8" Tenon**		
Pole Top O.D. (Inches)	**3"**	**4"**	**5"**
Post Top	Standard	Spacer (Provided) & ARPA4-XX (Order Separately)	Spacer (Provided) & ARPA4-XX (Order Separately)
Single Arm Mount	Spacer (Provided)	Spacer (Provided)	Spacer (Provided)

Tenon O.D. (Inches)	**3" Tenon**		
Pole Top O.D. (Inches)		**4"**	**5"**
Post Top		ARPA4-XX (Order Separately)	ARPA4-XX (Order Separately)
Single Arm Mount		Standard	Standard
Twin Mount		Standard	Standard

POLE CONFIGURATIONS (ARP DECORATIVE POLE SHOWN)



CONTROL OPTIONS

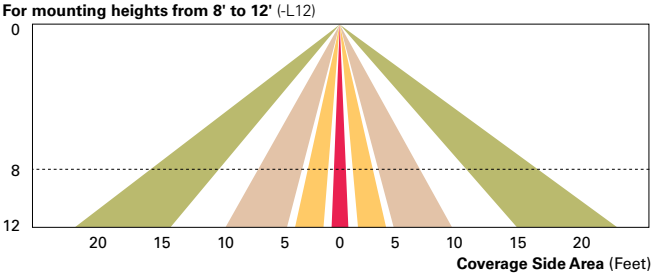
0-10V (D) The dimming option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (PER and PER7) Photocontrol receptacles provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

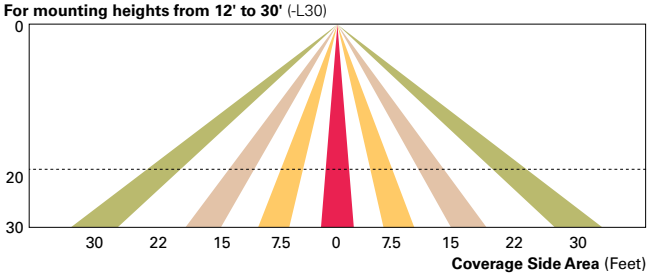
Dimming Occupancy Sensor (MS) These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (/DIM) option is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output. When a sensor for ON/OFF operation is selected, the luminaire will turn off after five minutes of no activity.

These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". Note: For MS sensors, the factory preset is OFF (Disabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 8'-40'.

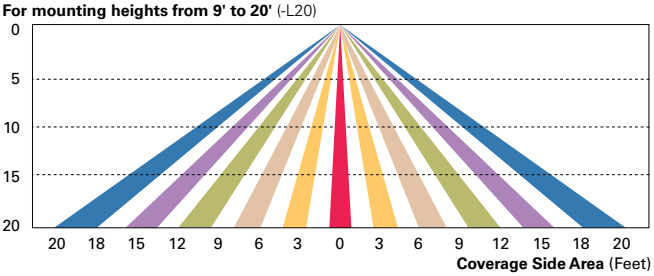
For mounting heights from 8' to 12' (-L12)



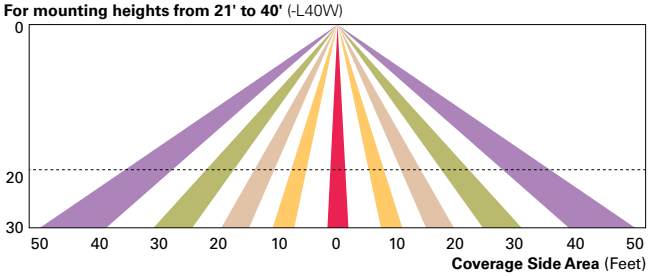
For mounting heights from 12' to 30' (-L30)



For mounting heights from 9' to 20' (-L20)



For mounting heights from 21' to 40' (-L40W)

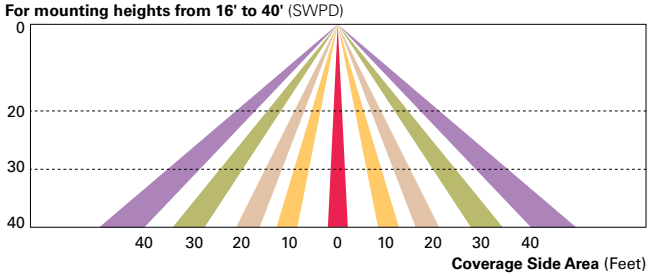


WaveLinx Wireless Control and Monitoring System Available in 7-PIN or 4-PIN configurations, the WaveLinx Outdoor control platform operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. Use the WaveLinx Mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets).

WaveLinx Outdoor Control Module (WOLC-7P-10A) A photocontrol that enables astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.

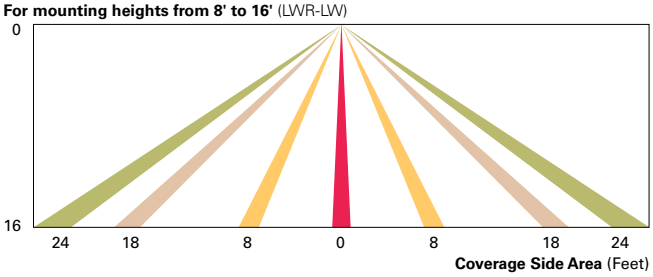
WaveLinx Wireless Sensor (SWPD4 and SWPD5) These outdoor sensors offer passive infrared (PIR) occupancy and a photocell for closed loop daylight sensing. These sensors can be factory installed or field-installed via simple, tool-less integration into luminaires equipped with the Zhaga Book 18 compliant 4-PIN receptacle (ZW). These sensors are factory preset to dim down to approximately 50 percent power after 15 minutes of no activity detected. These occupancy sensors include an integral photocell for "dusk-to-dawn" control or daylight harvesting that is factory-enabled. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 7'-40'.

For mounting heights from 16' to 40' (SWPD)

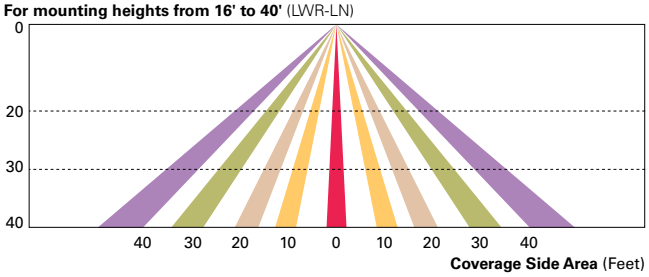


LumaWatt Pro Wireless Control and Monitoring System (LWR-LW and LWR-LN) The Eaton's LumaWatt Pro powered by Enlighted is a connected lighting solution that combines LED luminaires with an integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of other resources beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)



For mounting heights from 16' to 40' (LWR-LN)



POWER AND LUMENS

Lumen Package		B1	B2	B3	B4
Drive Current					
Power Wattage (Watts)		24W	48W	96W	99W
Input Current (mA) @ 120V		200	400	800	830
Input Current (mA) @ 208V		120	240	470	480
Input Current (mA) @ 240V		100	200	400	420
Input Current (mA) @ 277V		90	180	350	360
Power Wattage (Watts)		26W	53W	107W	108W
Input Current (mA) @ 347V		79	161	325	328
Input Current (mA) @ 480V		58	117	235	237
Optics					
Type II	Lumens	2,045	3,994	7,362	--
	BUG Rating	B1-U1-G1	B1-U2-G2	B3-U2-G3	--
Type III	Lumens	2,324	4,534	8,451	--
	BUG Rating	B1-U1-G1	B1-U2-G2	B2-U2-G3	--
Type IV	Lumens	2,408	4,691	8,740	--
	BUG Rating	B1-U1-G1	B1-U2-G2	B2-U2-G3	--
Type V	Lumens	2,311	4,529	8,511	9,464
	BUG Rating	B2-U1-G1	B3-U2-G2	B3-U2-G3	B3-U2-G3

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (60,000 Hours)	Calculated L70 (Hours)
25°C	>91%	>230,000
40°C	>88%	>172,000
50°C	>86%	>142,000

NOTE: Maintenance data applies to the highest drive current and represents the worst case at the highest wattage.

COLOR TEMPERATURE

Color Temperature (CCT)	CRI (Nominal)	Multiplier
4000	70	1.00
3000	80	0.91

MINIMUM AMBIENT TEMPERATURE

Lumen Package	Temperature
B1	-40°C
B2	-35°C
B3	-35°C
B4	-40°C
All DALI powered lumen packages	-20°C

ORDERING INFORMATION

Sample Number: ARB-B2-LED-D1-T2-GM

Product Family [1, 2]	Lumens [3]	Lamp Type	Voltage	Distribution	Color
ARB=Arbor Post Top	**B1**=Nominal 2,300 Lumens **B2**=Nominal 4,500 Lumens **B3**=Nominal 8,500 Lumens **B4**=Nominal 9,500 Lumens [4]	**LED**=Solid State Light Emitting Diodes	**D1**=Dimming Driver (120-277V) **347**=347V [5] **480**=480V [5, 6]	**T2**=Type II **T3**=Type III **T4**=Type IV **T5**=Type V	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **CC**=Custom Color [7]

Options (Add as Suffix)

7030=70 CRI / 3000K CCT [8]
8030=80 CRI / 3000K CCT [8]
PC=Button Type Photocontrol
PER=NEMA 3-PIN Twistlock Photocontrol Receptacle
PER7=NEMA 7-PIN Twistlock Photocontrol Receptacle
HA=50°C High Ambient Temperature [9]
MS-L08=Photo/Motion Sensor for ON/OFF Operation, Maximum 8' Mounting Height [10, 11]
MS-L20= Photo/Motion Sensor for ON/OFF Operation, 9' - 20' Mounting Height [10, 11]
MS-L40W=Photo/Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height [10, 11]
MS/DIM-L08=Photo/Motion Sensor for Dimming Operation, Maximum 8' Mounting Height [10, 11]
MS/DIM-L20=Photo/Motion Sensor for Dimming Operation, 9' - 20' Mounting Height [10, 11]
MS/DIM-L40W=Photo/Motion Sensor for Dimming Operation, 21' - 40' Mounting Height [10, 11]
ZW=Wavelinx-enabled 4-PIN Twistlock Receptacle [10, 11, 12, 13]
ZW-SWPD4WH=Wavelinx Wireless Sensor, 7' - 15' Mounting Height, White [10, 11, 12, 13]
ZW-SWPD5WH=Wavelinx Wireless Sensor, 15' - 40' Mounting Height, White [10, 11, 12, 13]
LWR-LW= LumaWatt Pro Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [10, 14]
LWR-LN=LumaWatt Pro Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [10, 14]
5LTD=Fifth Light Dali Driver [10, 15]
DIM=0-10V External Dimming Leads [10, 16]
VS=Tempered Glass Vandal Shield

Accessories (Order Separately) [17]

ARSA-XX=Single Pole Mount Arm [18]
ARWM-XX=Wall Mount Arm
ARTA15-XX=Twin Mount Bracket [18]
ARPA4-XX=Pole Adapter 4" O.D. Pole
FSIR-100=Wireless Configuration Tool for Occupancy Sensor [19]
SWPD4-WH=Wavelinx Wireless Sensor, 7' - 15' Mounting Height, White [13, 20]
SWPD5-WH=Wavelinx Wireless Sensor, 16' - 40' Mounting Height, White [13, 20]
WOLC-7P-10A=Wavelinx Outdoor Control Module (7-PIN) [10, 21]

NOTES:
1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional information.
2. Fixture slipfits over standard 2-3/8" tenon. 3" O.D. tenon when used with a ARPA4-XX 4" O.D. pole adapter.
3. Standard 4000K CCT, nominal 70CRI.
4. B4 only available with Type V distribution.
5. Requires the use of a step down transformer.
6. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
7. Custom and RAL color matching available upon request. Consult your lighting representative at Eaton for more information.
8. Extended lead times apply. Use dedicated IES files when performing layouts. These files are published on the Arbor luminaire product page on the website.
9. Not available with B3 lumen package in Type II, III, or IV distributions.
10. Controls system is not available with photocontrol (PC), photocontrol receptacle (PER or PER7), or other controls systems (MS, ZW, LWR, 5LTD, or DIM).
11. Not available with HA option.
12. Sensor passive infrared (PIR) may be overly sensitive below -20°C (-4°F).
13. In order for device to be field-configurable, requires WAC Gateway components WAC-POE and WPOE-120 in appropriate quantities. Only compatible with WaveLinx system and software and requires system components to be installed for operation. See website for more WaveLinx application information.
14. LumaWatt Pro wireless sensors are factory installed and require network components LWP-EM-1, LWP-GW-1, and LWP-PoE8 in appropriate quantities. See website for LumaWatt Pro application information.
15. Only available in B1 and B2 lumen packages.
16. Low voltage control leads brought 18" outside fixture.
17. Replace XX with paint color.
18. Fits on 3" O.D. x 4" long tenon for nominal 4-1/2" O.D. pole top.
19. This tool enables adjustment to Motion Sensor (MS) parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative for more information.
20. Requires Wavelinx-enabled 4-PIN twistlock receptacle (ZW) option.
21. Requires 7-PIN NEMA twistlock photocontrol receptacle (PER7) option.

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

Altitude®

FEATURES

- Elegant form factor
- High performance optics up to 17,500 delivered lumens
- Diffusion lens for low glare comfort
- NX™ wireless control options



c UL us LISTED

ida DARK SKY APPROVED 2016

3000K and warmer CCTs only

CONTROL TECHNOLOGY

NX DISTRIBUTED INTELLIGENCE

RELATED PRODUCTS

Ouro Pavilion PGL8

SPECIFICATIONS

CONSTRUCTION

- One piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 with vents and .100" minimum wall thickness
- Separate internal driver compartment rated for IP66 ingress protection
- Finish: fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat
- Standard colors include (BLS) Black Gloss Smooth, (BLT) Black Matte Textured, (DBS) Dark Bronze Gloss Smooth, (GTT) Graphite Matte Textured, (LGS) Light Gray Gloss Smooth, (PSS) Platinum Silver Smooth, (VGS) Verde Green Smooth, (WH) White, and (CC) Custom Color (Include RAL#)
- Lens is impact resistant 1/8" tempered glass with anti-reflective coating
- Lens has a one-piece extruded vulcanized silicone gasket
- Lens frame one piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 and .100" minimum wall thickness
- Lens frame has a one-piece O-ring extruded vulcanized silicone gasket
- Mid-frame one piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 and .100" minimum wall thickness
- Mid-frame secures to Lens Frame and housing by stainless steel recessed Allen-head screws
- Silicone gaskets throughout
- All external fasteners are stainless steel

OPTICS

- LEDs mount to a metal printed circuit board assembly (MCPCB)
- Optical lenses are clear injection molded PMMA acrylic

INSTALLATION

- Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury

ELECTRICAL

- Universal voltage, 120 through 277V with a ±10% tolerance. Driver is Underwriters Laboratories recognized
- High voltage configurations, 347/480. Driver has a 0-10V dimming interface for multi-level illumination options. Driver is Underwriters Laboratories recognized
- "Thermal Shield", secondary side, thermistor provides protection for the sustainable life of LED module and electronic components
- Drivers shall have greater than a 0.9 power factor, less than 20% harmonic distortion, and be suitable for operation in -40°C to 40°C ambient environments
- Luminaire shall be capable of operating at 100% brightness in a 40°C environment. Both driver and optical array have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C

ELECTRICAL (CONTINUED)

- Dimming range from 10% to 100% through the use of standard 0-10V interface on the programmable driver
- Modular wiring harness in the service area provides user access to the dimming circuitry
- Optional factory programmed dimming profile
- Surge protection: 10,000k in parallel, 20,000k in series
- SF for 120, 277, 347 Line volts
  DF for 208, 240, 480 Line volts
- Wiring: No. 18AWM rated 105°C, wet rating.

CERTIFICATIONS AND LISTINGS

- UL 1598 Standard for Luminaires
- IP66 certified
- RoHS compliant

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	1,673–18,452
Wattage Range	22–156
Efficacy Range (LPW)	56–137
Reported Life (Hours)	L70/60,000
Weight	21.5 lbs 9.75 kg
EPS Front View / Side View	.37 / .64

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HUBBELL Lighting

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

ORDERING GUIDE

Example: ALT1-54L-120-3K8-3-UNV-A34-GT-NXSPW30F-CLR

CATALOG #

HOUSING

ALT1

Housing		LED Engine		CCT/CRI		Distribution		Rotation		Voltage	
ALT1	Architectural Area/Site	**28L-20**	20W, 3,000 lm	**AM**	Amber[9]	**FR**	Type I/Front Row		Blank for no rotation	**UNV**	Universal 120–277V
		28L-40	40W, 5,000 lm	**3K7**	3000K, 70 CRI	**2**	Type II	**L**	Optic rotation left[1]	**347**	347V
		28L-60	60W, 7,500 lm	**3K8**	3000K, 80 CRI	**3**	Type III	**R**	Optic rotation right[1]	**480**	480V
		28L-85	85W, 10,000 lm	**3K9**	3000K, 90 CRI	**4**	Type IV				
		54L-95	95W, 12,500 lm	**4K7**	4000K, 70 CRI	**4W**	Type IV Wide				
		54L-120	120W, 15,000 lm	**4K8**	4000K, 80 CRI	**5QM**	Type V Square Medium				
		54L-155	155W, 17,500 lm	**5K7**	5000K, 70 CRI	**5QN**	Type V Square Narrow				
				5K8	5000K, 80 CRI	**5R**	Type V Rectangular				
						5W	Type V Wide (Round)				

Mounting		Fixture Finish		Control Options		Options		Control Accessories	
ASQ	Arm Square pole	**BL**	Black	**7PR**	7 pin PCR, wireless control enabled	**BC**	Backlight Control[6]	**SCPREMOTE**	Remote control for SCP option. Order at least one per project to program and control the occupancy sensor
A34	Arm mt 3.3–4.2" OD pole	**DB**	Dark Bronze	**7PR-TL**	7 pin PCR with twist lock photocontrol	**SF**	Single Fuse	**SW7PR**	SiteSync™ on fixture module via 7PR
A46	Arm mt 4.5–6.0" OD pole	**GT**	Graphite	**7PR-SC**	7 pin PCR with shorting cap	**DF**	Double Fuse	**SWUSB**	SiteSync™ Software on USB
MAF	Horizontal Slipfitter 2.375" OD arm	**LG**	Light Grey	**AD-012**	AstroDIM: 50% output at midnight[10]	**TB**	Terminal Block	**SWTAB**	SiteSync™ Windows Tablet[8]
SVSF	Vertical Slipfitter Mount square for 2" pipe tenon, (2.375" OD)	**PS**	Platinum Silver	**AD-022**	AstroDIM: 50% output midnight to 4 AM[10]	**CLR**	Clear Lens	**SWBRG**	SiteSync™ Wireless Bridge Node
VSF	Vertical Slipfitter Mount for 2" pipe tenon, (2.375" OD)	**TT**	Titanium	**AD-032**	AstroDIM: 50% output 10PM[10]	**HDL**	Diffuse Lens[7]	**SWFC**	SiteSync™ Field Commission Service
WB	Wall Bracket for area wall mount	**WH**	White	**AD-042**	AstroDIM: 50% output 10PM to 4AM[10]			**WIR-RME-L**	wiSCAPE™ External Fixture Module
		CC	Custom Color[2]	**NXSP14F**	Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' [3,4]			**NXOFM-1R1D-UNV**	NX External Contol Node
				NXSP30F	Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' [3,4]				
				NXSPW14F	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' [3,4]				
				NXSPW30F	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' [3,4]				
				NXWE	NX Wireless Enabled				
				SCL-8F	Low voltage sensor for 3rd party wireless controls via 7PR. For mounting heights up to 8'				
				SCL-40F	Low voltage sensor for 3rd party wireless controls via 7PR. For mounting heights 9' to 40'				
				SCP-8F	Remote control programable line voltage sensor, use with SCPREMOTE				
				SCP-40F	Remote control programable line voltage sensor, use with SCPREMOTE				
				SWP	Site Sync™ Pre Commission Wireless Module[3,4,5]				
				SWPM-40F	Site Sync with Sensor 9' to 40' MH[3,4,5]				

Notes:

1 Not available with 5QM and 5W distributions

2 Consult factory

3 Not available with other sensor or wireless control options

4 Not available in 480V

5 Specify group and zone at time of order, See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node

6 Not available with Type 5 distributions, CLR, or HDL option

7 Only available in Type 3 or Type 5W

8 Microsoft, Encarta, MSN, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries

9 Wildlife friendly

10 Not available for 28L-20 engine and sensor options

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KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

PRODUCT EXCEPTIONS & DETAILS

Configuration			EPA
	1SA	1 Arm Side Mount	0.98
	2SB	2 Arm Side Mount	1.48
	2SL	2 Arm Side Mount	1.96
	3ST	3 Arm Side Mount	2.20

Configuration			EPA
	3SY*	3 Arm Side Mount	2.46
	4SC	4 Arm Side Mount	2.46
	1W	Single Wall Mount	n/a
	HSF	Horizontal Slipfitter	n/a

DELIVERED LUMENS

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	20	3,000	No Lens	FR	3110	0	0	0	141	3274	0	0	0	149	3318	1	0	0	148
				FR-BC	2036	0	0	0	93	2143	0	0	0	97	2172	0	0	0	97
				2	2903	1	0	1	132	3056	1	0	1	139	3097	1	0	1	138
				2-BC	1771	0	0	0	80	1864	0	0	0	85	1889	0	0	0	84
				3	2945	1	0	1	131	3100	1	0	1	138	3141	1	0	1	140
				3-BC	1779	0	0	1	81	1873	0	0	1	85	1898	0	0	1	85
				4	2943	0	0	1	134	3098	0	0	1	141	3139	0	0	1	141
				4-BC	2189	0	0	1	100	2304	0	0	1	105	2335	0	0	1	104
				4W	2927	1	0	1	133	3081	1	0	1	140	3122	1	0	1	139
				4W-BC	1673	0	0	1	76	1761	0	0	1	80	1785	0	0	1	80
				5R	3025	2	0	2	137	3184	2	0	2	145	3227	2	0	2	144
				5QM	3069	2	0	0	139	3230	2	0	0	147	3273	2	0	0	146
				5QN	3051	2	0	0	139	3211	2	0	0	146	3254	2	0	0	145
				5W	3024	2	0	1	137	3183	2	0	1	145	3226	2	0	1	144
			Clear Lens	FR	2909	0	0	0	132	3062	0	0	0	139	3103	0	0	0	141
				2	2715	1	0	1	123	2858	1	0	1	130	2896	1	0	1	132
				3	2754	1	0	1	125	2899	1	0	1	132	2938	1	0	1	134
				4	2752	0	0	1	125	2897	0	0	1	132	2936	0	0	1	133
				4W	2738	1	0	1	124	2882	1	0	1	131	2920	1	0	1	133
				5R	2829	2	0	2	129	2978	2	0	2	135	3018	2	0	2	137
				5QM	2870	2	0	0	130	3021	2	0	0	137	3062	2	0	0	139
				5QN	2853	2	0	0	130	3003	2	0	0	137	3044	2	0	0	138
				5W	2829	2	0	1	129	2977	2	0	1	135	3017	2	0	1	137
			HDL Lens	3	2341	1	0	1	106	2464	1	0	1	112	2497	1	0	1	114
				5W	2405	1	0	1	109	2531	1	0	1	115	2565	1	0	1	117

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ALT1

ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	40	5,000	No Lens	FR	4870	1	0	0	128	5127	1	0	0	135	5195	1	0	0	137
				FR-BC	3189	0	0	0	84	3356	0	0	0	88	3401	0	0	0	90
				2	4546	1	0	1	120	4785	1	0	1	126	4849	1	0	1	128
				2-BC	2773	0	0	1	73	2919	0	0	1	77	2958	0	0	1	78
				3	4611	1	0	2	121	4854	1	0	2	128	4919	1	0	2	129
				3-BC	2786	0	0	1	73	2933	0	0	1	77	2972	0	0	1	78
				4	4608	1	0	2	121	4851	1	0	2	128	4915	1	0	2	129
				4-BC	3428	0	0	1	90	3608	0	0	1	95	3656	0	0	1	96
				4W	4584	1	0	2	121	4825	1	0	2	127	4889	1	0	2	129
				4W-BC	2621	0	0	1	69	2758	0	0	1	73	2795	0	0	1	74
				5R	4737	2	0	2	125	4986	3	0	1	131	5053	3	0	3	133
				5QM	4806	2	0	1	126	5058	2	0	1	133	5126	2	0	1	135
				5QN	4777	2	0	0	126	5028	2	0	0	132	5096	2	0	0	134
				5W	4736	3	0	1	125	4985	2	0	2	131	5052	3	0	1	133
			Clear Lens	FR	4555	1	0	0	120	4795	1	0	0	126	4859	1	0	0	128
				2	4252	1	0	1	112	4476	1	0	1	118	4536	1	0	1	119
				3	4333	1	0	1	114	4561	1	0	1	120	4622	1	0	1	121
				4	4310	0	0	2	113	4537	1	0	2	119	4598	1	0	2	121
				4W	4287	1	0	2	113	4513	1	0	2	119	4573	1	0	2	120
				5R	4431	2	0	2	117	4663	2	0	2	123	4726	2	0	2	124
				5QM	4495	2	0	1	118	4731	2	0	1	125	4794	2	0	1	126
				5QN	4468	2	0	0	118	4703	2	0	0	124	4766	2	0	0	125
				5W	4430	3	0	1	117	4663	3	0	1	123	4725	3	0	1	124
			HDL Lens	3	3741	1	0	1	98	3937	1	0	1	104	3990	1	0	1	105
				5W	3891	2	0	1	102	4095	2	0	1	108	4150	2	0	1	109

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	60	7,500	No Lens	FR	7347	1	0	1	122	7733	1	0	1	129	7837	1	0	1	131
				FR-BC	4810	0	0	0	80	5063	0	0	0	84	5131	0	0	0	86
				2	6858	1	0	2	114	7218	1	0	2	120	7315	1	0	2	122
				2-BC	4183	0	0	1	70	4403	0	0	1	73	4462	0	0	1	74
				3	6956	1	0	2	116	7322	1	0	2	122	7420	1	0	2	123
				3-BC	4203	0	0	1	70	4424	0	0	1	74	4483	0	0	1	75
				4	6951	1	0	2	116	7317	1	0	2	122	7415	1	0	2	124
				4-BC	5171	0	0	2	86	5443	0	0	2	91	5516	0	0	2	92
				4W	6915	1	0	2	115	7278	1	0	2	121	7376	1	0	2	123
				4W-BC	3953	0	0	2	66	4161	0	0	2	69	4216	0	0	2	70
				5R	7145	3	0	3	119	7521	3	0	3	125	7622	3	0	3	127
				5QM	7249	3	0	1	121	7630	3	0	1	127	7732	3	0	1	129
				5QN	7206	3	0	0	120	7585	3	0	0	126	7687	3	0	0	128
				5W	7144	3	0	2	119	7520	3	0	2	125	7620	3	0	2	127
			Clear Lens	FR	6872	1	0	1	115	7233	1	0	1	121	7330	1	0	1	122
				2	6414	1	0	2	107	6751	1	0	2	113	6842	1	0	2	114
				3	6506	1	0	2	108	6848	1	0	2	114	6940	1	0	2	116
				4	6502	1	0	2	108	6844	1	0	2	114	6935	1	0	2	116
				4W	6468	1	0	2	108	6807	1	0	2	113	6899	1	0	2	115
				5R	6683	3	0	3	111	7035	3	0	3	117	7129	3	0	3	119
				5QM	6780	3	0	1	113	7137	3	0	1	119	7232	3	0	1	121
				5QN	6740	2	0	0	112	7094	3	0	0	118	7189	3	0	0	120
				5W	6682	3	0	2	111	7033	3	0	2	117	7128	3	0	2	119
			HDL Lens	3	5531	2	0	1	92	5821	2	0	1	97	5899	2	0	1	98
				5W	5680	2	0	1	95	5979	2	0	1	100	6059	2	0	1	101

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	85	10,000	No Lens	FR	9699	1	0	1	113	10209	1	0	1	119	10346	1	0	1	120
				FR-BC	6350	0	0	1	74	6684	0	0	1	78	6773	0	0	1	79
				2	9054	1	0	2	105	9530	2	0	2	111	9657	2	0	2	112
				2-BC	5523	0	0	1	64	5813	0	0	1	68	5891	0	0	1	68
				3	9183	1	0	2	107	9666	1	0	2	112	9795	1	0	2	114
				3-BC	5549	0	0	2	65	5841	0	0	2	68	5919	0	0	2	69
				4	9177	1	0	2	107	9660	1	0	2	112	9789	1	0	2	114
				4-BC	6827	0	0	2	79	7186	0	0	2	84	7282	0	0	2	85
				4W	9129	1	0	3	106	9609	1	0	3	112	9737	1	0	3	113
				4W-BC	5219	0	0	2	61	5493	0	0	2	64	5567	0	0	2	65
				5R	9433	3	0	3	110	9929	3	0	3	115	10062	3	0	3	117
				5QM	9570	3	0	1	111	10073	3	0	1	117	10208	3	0	1	119
				5QN	9514	3	0	0	111	10014	3	0	0	116	10148	3	0	0	118
				5W	9432	4	0	2	110	9927	4	0	2	115	10060	4	0	2	117
			Clear Lens	FR	9072	1	0	1	105	9549	1	0	1	111	9677	1	0	1	113
				2	8468	1	0	2	98	8913	1	0	2	104	9033	1	0	2	105
				3	8589	1	0	2	100	9041	1	0	2	105	9162	1	0	2	107
				4	8584	1	0	2	100	9035	1	0	2	105	9156	1	0	2	106
				4W	8538	1	0	2	99	8987	1	0	3	105	9108	1	0	3	106
				5R	8823	3	0	3	103	9287	3	0	3	108	9411	3	0	3	109
				5QM	8951	3	0	1	104	9422	3	0	1	110	9548	3	0	1	111
				5QN	8898	3	0	0	103	9366	3	0	0	109	9491	3	0	0	110
				5W	8822	3	0	2	103	9285	4	0	2	108	9410	4	0	2	109
			HDL Lens	3	7302	2	0	2	85	7685	2	0	2	89	7788	2	0	2	91
				5W	7499	2	0	1	87	7893	2	0	1	92	7999	2	0	1	93

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	95	12,500	No Lens	FR	11792	1	0	1	125	12412	1	0	1	132	12578	1	0	1	134
				FR-BC	7848	0	0	1	83	8260	0	0	1	88	8371	0	0	1	90
				2	11210	2	0	2	119	11800	2	0	2	126	11958	2	0	2	126
				2-BC	5993	0	0	1	64	6308	0	0	1	67	6392	0	0	1	69
				3	11225	1	0	2	119	11815	2	0	2	126	11974	2	0	2	127
				3-BC	6273	0	0	2	67	6603	0	0	2	70	6691	0	0	2	72
				4	11311	1	0	2	120	11906	1	0	3	127	12065	1	0	3	128
				4-BC	7291	0	0	2	78	7674	0	0	2	82	7777	0	0	2	84
				4W	11203	2	0	3	119	11792	2	0	3	125	11950	2	0	3	127
				4W-BC	5603	0	0	2	60	5898	0	0	2	63	5977	0	0	2	65
				5R	11623	3	0	3	124	12234	3	0	3	130	12398	3	0	3	131
				5QM	11770	3	0	2	125	12389	3	0	2	132	12555	3	0	2	133
				5QN	11799	3	0	0	126	12420	3	0	0	132	12586	3	0	0	133
				5W	11594	4	0	2	123	12204	4	0	2	130	12367	4	0	2	131
			Clear Lens	FR	11029	1	0	1	117	11609	1	0	1	124	11765	1	0	1	125
				2	10485	2	0	2	112	11036	2	0	2	117	11184	2	0	2	119
				3	10555	1	0	2	112	11110	1	0	2	118	11259	1	0	2	120
				4	10579	1	0	2	113	11136	1	0	2	118	11285	1	0	2	120
				4W	10479	1	0	3	111	11029	2	0	3	117	11177	2	0	3	119
				5R	10871	3	0	3	116	11443	3	0	3	122	11596	3	0	3	123
				5QM	11009	3	0	2	117	11588	3	0	2	123	11743	3	0	2	125
				5QN	11036	3	0	0	117	11616	3	0	0	124	11772	3	0	0	125
				5W	10845	4	0	2	115	11415	4	0	2	121	11568	4	0	2	123
			HDL Lens	3	8736	2	0	2	93	9195	2	0	2	98	9318	2	0	2	100
				5W	9152	3	0	1	97	9633	3	0	1	102	9762	3	0	1	104

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	120	15,000	No Lens	FR	14390	1	0	1	118	15146	1	0	1	124	15349	1	0	1	125
				FR-BC	9577	1	0	1	78	10080	1	0	1	83	10215	1	0	1	84
				2	13680	2	0	2	112	14399	2	0	2	118	14592	2	0	2	120
				2-BC	7313	0	0	1	60	7697	0	0	2	63	7800	0	0	2	64
				3	13698	2	0	3	112	14418	2	0	3	118	14611	2	0	3	120
				3-BC	7655	0	0	2	63	8057	0	0	2	66	8165	0	0	2	67
				4	13803	1	0	3	113	14528	1	0	3	119	14723	1	0	3	121
				4-BC	8897	0	0	2	73	9365	0	0	2	77	9490	0	0	2	78
				4W	13671	2	0	3	112	14390	2	0	3	118	14583	2	0	4	120
				4W-BC	6838	1	0	2	56	7197	1	0	2	59	7294	1	0	2	60
				5R	14184	4	0	4	116	14929	4	0	4	122	15129	4	0	4	124
				5QM	14363	3	0	2	118	15118	4	0	2	124	15321	4	0	2	126
				5QN	14399	4	0	4	118	15156	4	0	1	124	15359	4	0	1	126
				5W	14149	4	0	2	116	14893	4	0	2	122	15092	4	0	2	124
			Clear Lens	FR	13459	1	0	1	110	14167	1	0	1	116	14356	1	0	2	118
				2	12795	2	0	2	105	13468	2	0	2	110	13648	2	0	2	112
				3	12812	2	0	2	105	13486	2	0	2	111	13666	2	0	2	112
				4	12910	1	0	3	106	13589	1	0	3	111	13771	1	0	3	113
				4W	12787	2	0	3	105	13459	2	0	3	110	13640	2	0	3	112
				5R	13266	4	0	4	109	13964	4	0	4	114	14151	4	0	4	116
				5QM	13434	3	0	2	110	14140	3	0	2	116	14330	3	0	2	117
				5QN	13467	4	0	0	110	14175	4	0	0	116	14365	4	0	0	118
				5W	13234	4	0	2	108	13929	4	0	2	114	14116	4	0	2	116
			HDL Lens	3	10892	3	0	2	89	11464	3	0	2	94	11618	3	0	2	95
				5W	11250	3	0	1	92	11841	3	0	2	97	12000	3	0	2	98

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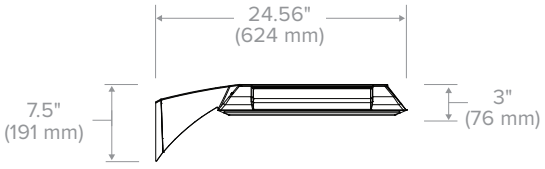
DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	155	17,500	No Lens	FR	17299	2	0	2	111	18208	2	0	2	117	18452	2	0	2	119
				FR-BC	11513	1	0	1	74	12118	1	0	1	78	12280	1	0	1	79
				2	16445	2	0	2	105	17310	2	0	3	111	17542	2	0	3	112
				2-BC	8791	0	0	2	56	9253	0	0	2	59	9377	0	0	2	60
				3	16467	2	0	3	106	17333	2	0	3	111	17565	2	0	3	113
				3-BC	9202	1	0	2	59	9686	1	0	2	62	9816	1	0	2	63
				4	16593	1	0	3	106	17465	1	0	3	112	17699	1	0	4	113
				4-BC	10696	0	0	2	69	11258	1	0	2	72	11409	1	0	2	73
				4W	16435	2	0	4	105	17299	2	0	4	111	17531	2	0	4	112
				4W-BC	8220	1	0	2	53	8652	1	0	2	55	8768	1	0	2	56
				5R	17051	4	0	4	109	17947	4	0	4	115	18188	4	0	4	117
				5QM	17267	4	0	2	111	18174	4	0	2	117	18418	4	0	2	118
				5QN	17309	4	0	1	111	18219	4	0	1	117	18463	4	0	1	118
				5W	17009	4	0	2	109	17903	4	0	2	115	18143	4	0	2	116
			Clear Lens	FR	16180	1	0	2	104	17030	1	0	2	109	17258	1	0	2	111
				2	15382	2	0	2	99	16190	2	0	2	104	16407	2	0	2	105
				3	15402	2	0	3	99	16212	2	0	3	104	16429	2	0	3	105
				4	15520	1	0	3	99	16336	1	0	3	105	16555	1	0	3	106
				4W	15372	2	0	4	99	16180	2	0	4	104	16397	2	0	4	105
				5R	15948	4	0	4	102	16787	4	0	4	108	17011	4	0	4	109
				5QM	16150	4	0	2	104	16999	4	0	2	109	17227	4	0	2	110
				5QN	16190	4	0	1	104	17041	4	0	1	109	17269	4	0	1	111
				5W	15909	4	0	2	102	16745	4	0	2	107	16969	4	0	2	109
			HDL Lens	3	13093	3	0	2	84	13782	3	0	2	88	13966	3	0	2	90
				5W	13524	3	0	2	87	14235	3	0	2	91	14426	3	0	2	92

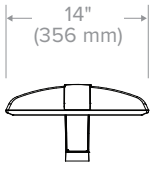
CRI Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

Amber Multiplier	
CCT	Multiplier
5000K	1
AM	0.1727

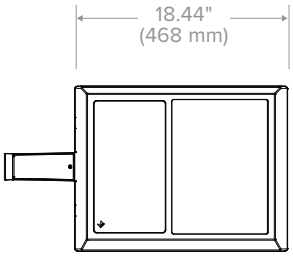
DIMENSIONS



Side View



Front View



Top View

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ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-FR

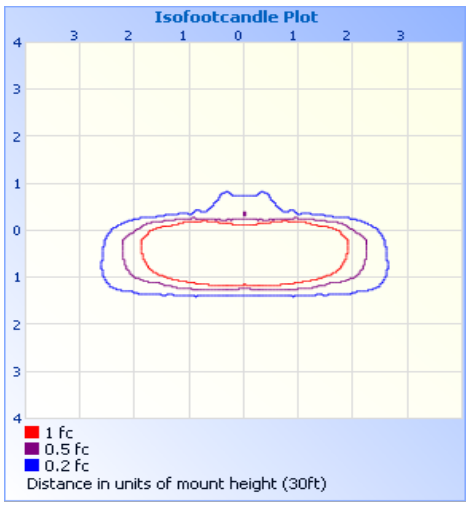
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18208**
Watts	**156**
Efficacy	**116.7**
IES Type	**I**
BUG Rating	**B2-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	16101	88.4%
Downward House Side	2107	11.6%
Downward Total	18208	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18208	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-2

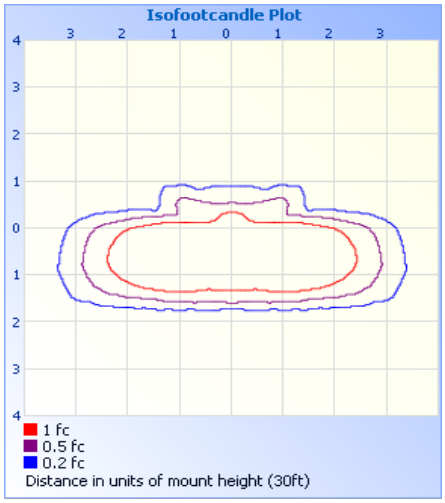
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17309**
Watts	**156**
Efficacy	**111.0**
IES Type	**II**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14323	82.7%
Downward House Side	2986	17.3%
Downward Total	17309	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17309	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-3

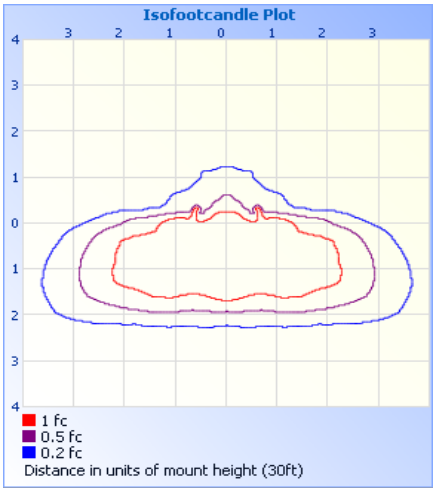
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17332**
Watts	**156**
Efficacy	**111.1**
IES Type	**III**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14911	86.0%
Downward House Side	2421	14.0%
Downward Total	17332	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17332	100%

ISOFOOT CANDLE PLOT



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ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-4

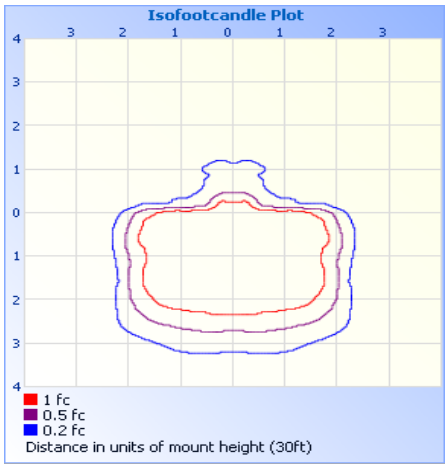
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17465**
Watts	**156**
Efficacy	**112.0**
IES Type	**IV**
BUG Rating	**B1-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15757	90.2%
Downward House Side	1708	9.8%
Downward Total	17465	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17465	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-4W

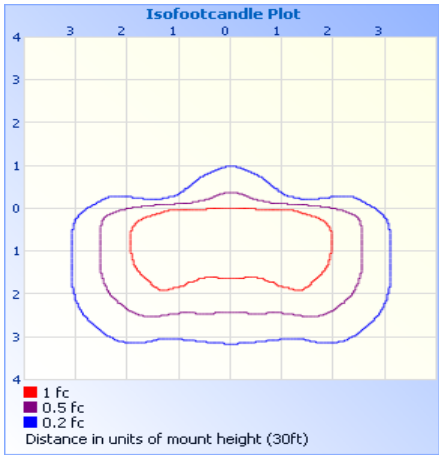
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17299**
Watts	**156**
Efficacy	**110.9**
IES Type	**IV**
BUG Rating	**B2-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15320	88.6%
Downward House Side	1979	11.4%
Downward Total	17299	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17299	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5R

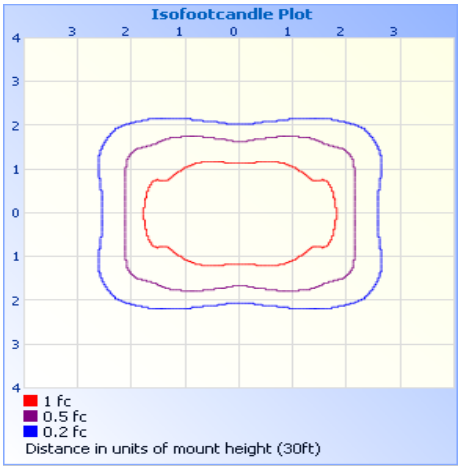
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17947**
Watts	**156**
Efficacy	**115.0**
IES Type	**III**
BUG Rating	**B4-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8974	50.0%
Downward House Side	8974	50.0%
Downward Total	17947	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17947	100%

ISOFOOT CANDLE PLOT



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ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-5QM

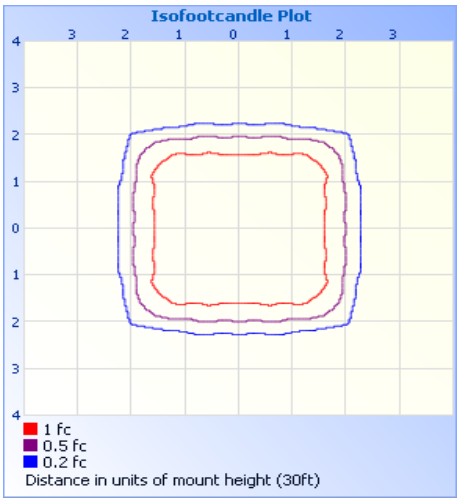
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18173**
Watts	**156**
Efficacy	**116.5**
IES Type	**V**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9087	50.0%
Downward House Side	9087	50.0%
Downward Total	18173	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18173	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5QN

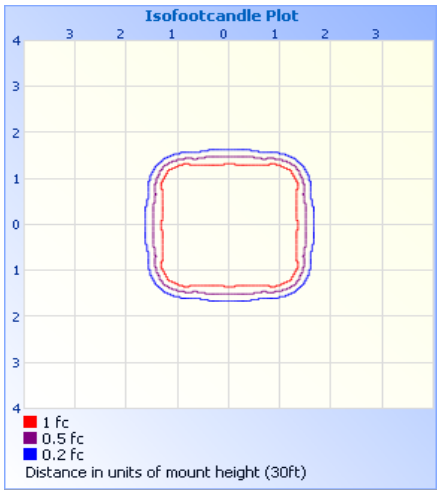
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18219**
Watts	**156**
Efficacy	**116.8**
IES Type	**V**
BUG Rating	**B4-U0-G1**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9110	50.0%
Downward House Side	9110	50.0%
Downward Total	18219	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18219	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5W

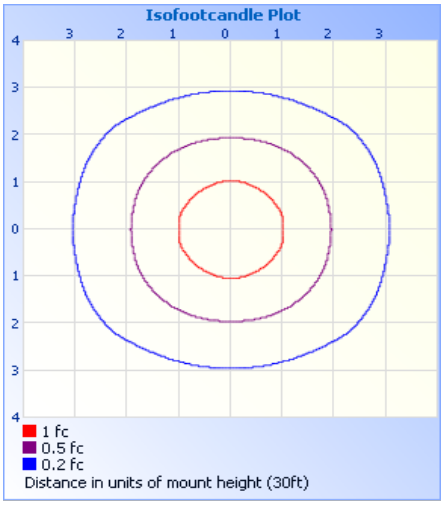
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17904**
Watts	**156**
Efficacy	**114.8**
IES Type	**V**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8952	50.0%
Downward House Side	8952	50.0%
Downward Total	17904	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17904	100%

ISOFOOT CANDLE PLOT



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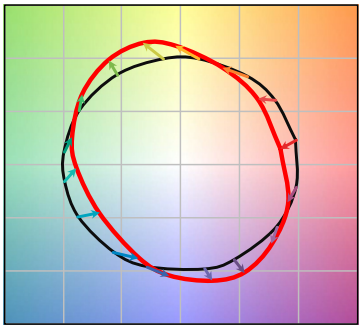
TM-30 DATA

COLOR VECTOR GRAPHIC

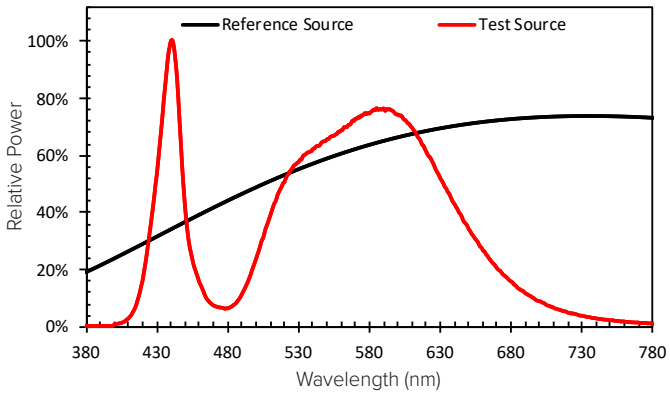


Reference Illuminant — Test Source

TEST SOURCE

R_f	68
R_g	99
CCT(K)	3947
D_{UV}	0.0004
x	0.3831
y	0.3793
CIE R_a	72

SPECTRAL POWER DISTRIBUTION COMPARISON



ELECTRICAL DATA

Electrical													Dimming			
# LED	System Watts	Drive Current	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming Range	Source current out of 0-10V		Absolute voltage range on 0-10V (+)	
			VAC	Hz	120	208	240	277	347	480				Min	Max	Min	Max
28	22	250 mA	120-480	50/60	0.18	0.11	0.09	0.08	0.06	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
	38	400 mA			0.32	0.18	0.16	0.14	0.11	0.08							
	60	650 mA			0.50	0.29	0.25	0.22	0.17	0.13							
	86	950 mA			0.72	0.41	0.36	0.31	0.25	0.18							
54	94	550 mA			0.78	0.45	0.39	0.34	0.27	0.20							
	122	700 mA			1	0.59	0.51	0.44	0.35	0.25							
	156	900 mA			1.30	0.75	0.65	0.56	0.45	0.33							

TM-21 Lifetime Calculation - Projected Lumen Maintenance (25°C / 77°C)						
Hours	0	25,000	36,000	50,000	100,000	Reported L70
Projected Lumen Maintenance	100%	96.9%	95.3%	93.3%	86.6%	> 60,000

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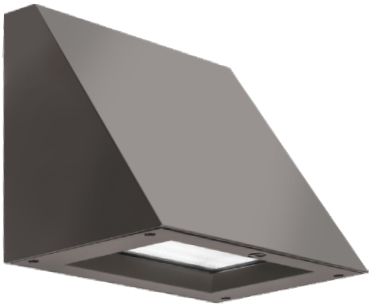
HUBBELL® Lighting



WDGE2 LED
Architectural Wall Sconce

Catalog Number

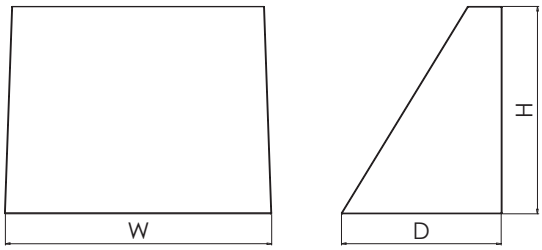
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth: 7″
Height: 9″
Width: 11.5″
Weight: (without options) 13.5 lbs



Introduction

The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.

WDGE2 delivers up to 6,000 lumens with a soft, non-pixelated light source, creating a visually comfortable environment. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

WDGE LED Family Overview

Luminaire	Standard EM, 0°C	Cold EM, -20°C	Sensor	Lumens (4000K)					
				P1	P2	P3	P4	P5	P6
WDGE1 LED	4W	--	--	1,200	2,000	--	--	--	--
WDGE2 LED	10W	18W	Standalone / nLight	1,200	2,000	3,000	4,500	6,000	--
WDGE3 LED	15W	18W	Standalone / nLight	7,500	8,500	10,000	12,000	--	--
WDGE4 LED	--	--	Standalone / nLight	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI VF MVOLT DDBXD

Series	Package		Color Temperature		CRI	Distribution		Voltage	Mounting	
WDGE2 LED	P1[1]	P1SW	27K	2700K	80CRI	VF	Visual comfort forward throw	MVOLT	**Shipped included**	**Shipped separately**
	P2[1]	P2SW	30K	3000K	90CRI	VW	Visual comfort wide	347[3]	SRM Surface mounting bracket	AWS 3/8inch Architectural wall spacer
	P3[1]	P3SW	35K	3500K				480[3]		BBW Surface-mounted back box
	P4[1]	Door with small window (SW) is required to accommodate sensors. See page 2 for more details.	40K	4000K						PBBW Premium surface-mounted back box (top, left, right conduit entry)
	P5[1]		50K[2]	5000K						

Options

E4WH	Emergency battery backup, CEC compliant (4W, 0°C min)
E10WH	Emergency battery backup, CEC compliant (10W, 5°C min)
E20WC	Emergency battery backup, CEC compliant (18W, -20°C min)
PE[4]	Photocell, Button Type
DS[5]	Dual switching (comes with 2 drivers and 2 light engines; see page 3 for details)
DMG[6]	0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)
BCE	Bottom conduit entry for premium back box (PBBW). Total of 4 entry points.

Standalone Sensors/Controls (only available with P1SW, P2SW & P3SW)

PIR	Bi-level (100/35%) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching.
PIRH	Bi-level (100/35%) motion sensor for 15-30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching
PIR1FC3V	Bi-level (100/35%) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation.
PIRH1FC3V	Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation.

Networked Sensors/Controls (only available with P1SW, P2SW & P3SW)

NLTAIR2 PIR	nLightAIR Wireless enabled bi-level motion/ambient sensor for 8-15' mounting heights.
NLTAIR2 PIRH	nLightAIR Wireless enabled bi-level motion/ambient sensor for 15-30' mounting heights.

See page 4 for out of box functionality

Finish

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DSSXD	Sandstone
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white
DSSTXD	Textured sandstone

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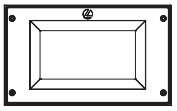
Accessories

Ordered and shipped separately.

WDGEAWS DDBXD U	WDGE 3/8inch Architectural Wall Spacer (specify finish)
WDGE2PBBW DDBXD U	WDGE2 Premium surface-mounted back box (specify finish)
WSBBW DDBXD U	Surface - mounted back box (specify finish)

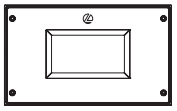
NOTES

1 P1-P5 not available with sensors/controls. Sensors/controls only available with P1SW, P2SW and P3SW.
2 50K not available in 90CRI
3 347V and 480V not available with E4WH, E10WH, E20WC or DS.
4 PE not available in 480V or with sensors/controls
5 DS option not available with E4WH, E10WH, E20WC or sensors/controls.
6 DMG option not available with sensors/controls



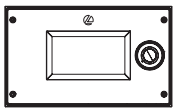
Default configuration with no sensors/controls.

Power Packages: P1, P2, P3, P4, P5



Small Window (SW) configuration

Power Packages: P1SW, P2SW, P3SW



Configuration with sensors/controls

Power Packages: P1SW, P2SW, P3SW

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Dist. Type	27K (2700K, 80 CRI)		30K (3000K, 80 CRI)		35K (3500K, 80 CRI)		40K (4000K, 80 CRI)		50K (5000K, 80 CRI)	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
P1 / P1SW	10W	VF	1,166	119	1,209	123	1,251	128	1,256	128	1,254	128
		VW	1,197	122	1,241	126	1,284	131	1,289	131	1,286	131
P2 / P2SW	15W	VF	1,878	129	1,947	134	2,015	139	2,023	139	2,019	139
		VW	1,927	133	1,997	137	2,067	142	2,075	143	2,071	143
P3 / P3SW	23W	VF	2,908	129	3,015	134	3,119	138	3,132	139	3,126	139
		VW	2,983	132	3,093	137	3,200	142	3,213	143	3,206	142
P4	35W	VF	4,096	117	4,247	121	4,394	126	4,412	126	4,403	126
		VW	4,202	120	4,357	125	4,508	129	4,526	129	4,517	129
P5	48W	VF	5,567	115	5,772	119	5,972	123	5,996	124	5,984	124
		VW	5,711	118	5,921	122	6,127	126	6,151	127	6,139	127

Electrical Load

Performance Package	System Watts	Current (A)					
		120V	208V	240V	277V	347V	480V
P1 / P1SW	10W	0.082	0.049	0.043	0.038	--	--
	13W	--	--	--	--	0.046	0.033
P2 / P2SW	15W	0.132	0.081	0.072	0.064	--	--
	18W	--	--	--	--	0.056	0.041
P3 / P3SW	23W	0.195	0.114	0.100	0.088	--	--
	26W	--	--	--	--	0.079	0.058
P4	35W	0.302	0.175	0.152	0.134	--	--
	38W	--	--	--	--	0.115	0.086
P5	48W	0.434	0.241	0.211	0.184	--	--
	52W	--	--	--	--	0.157	0.119

Lumen Multiplier for 90CRI

CCT	Multiplier
27K	0.845
30K	0.867
35K	0.845
40K	0.885
50K	0.898

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.96	>0.95	>0.91

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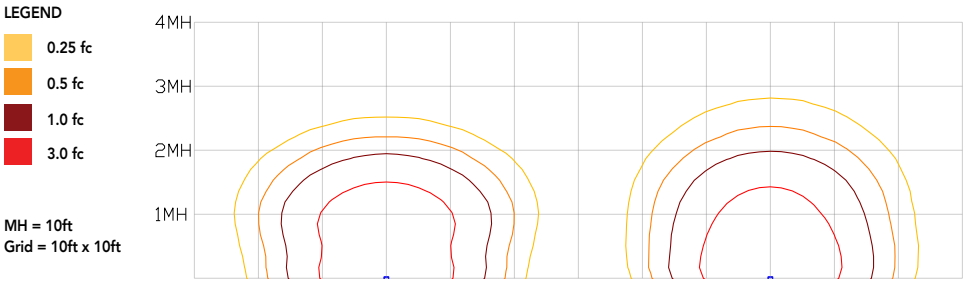
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WDGE LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.



WDGE2 LED P3 40K 80CRI VW

WDGE2 LED P3 40K 80CRI VF

Emergency Egress Options

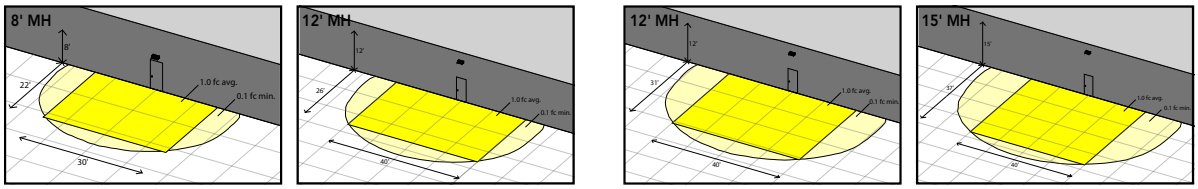
Emergency Battery Backup

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency battery backup configurations include an independent secondary driver with an integral relay to immediately detect loss of normal power and automatically energize the luminaire. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time normal power is lost and maintain a minimum of 60% of the light output at the end of 90minutes.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9

The examples below show illuminance of 1 fc average and 0.1 fc minimum in emergency mode with E10WH or E20WC and VF distribution.

Grid = 10ft x 10ft



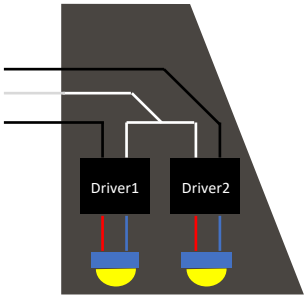
WDGE2 LED xx 40K 80CRI VF MVOLT E10WH

WDGE2 LED xx 40K 80CRI VF MVOLT E20WC

Dual Switching (DS) Option

The dual switching option offers operational redundancy that certain codes require. With this option the luminaire comes integrated with two drivers and two light engines. These work completely independent to each other so that a failure of any individual component does not cause the whole luminaire to go dark. This option is typically used with a back generator or inverter providing emergency power.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9



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Control / Sensor Options

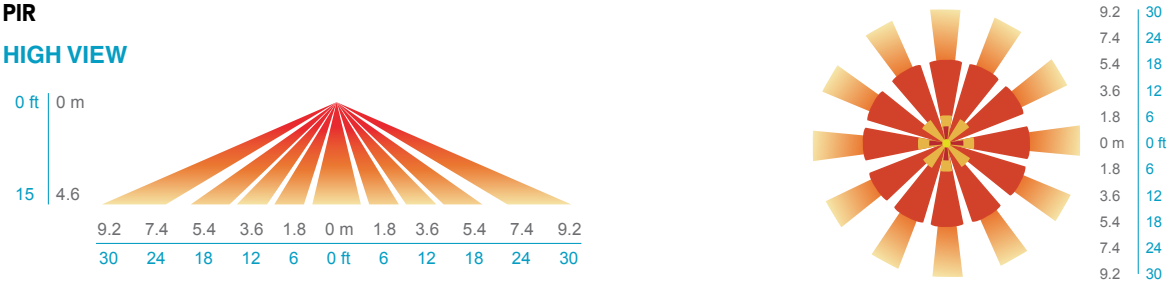
Motion/Ambient Sensor (PIR_, PIRH_)

Motion/Ambeint sensor (Sensor Switch MSOD) is integrated into the the luminaire. The sensor provides both Motion and Daylight based dimming of the luminaire. For motion detection, the sensor utilizes 100% Digital Passive Infrared (PIR) technology that is tuned for walking size motion while preventing false tripping from the environment. The integrated photocell enables additional energy savings during daytime periods when there is sufficient daylight. Optimize sensor coverage by either selecting PIR or PIRH option. PIR option comes with a sensor lens that is optimized to provide maximum coverage for mounting heights between 8-15ft, while PIRH is optimized for 15-40ft mounting height.

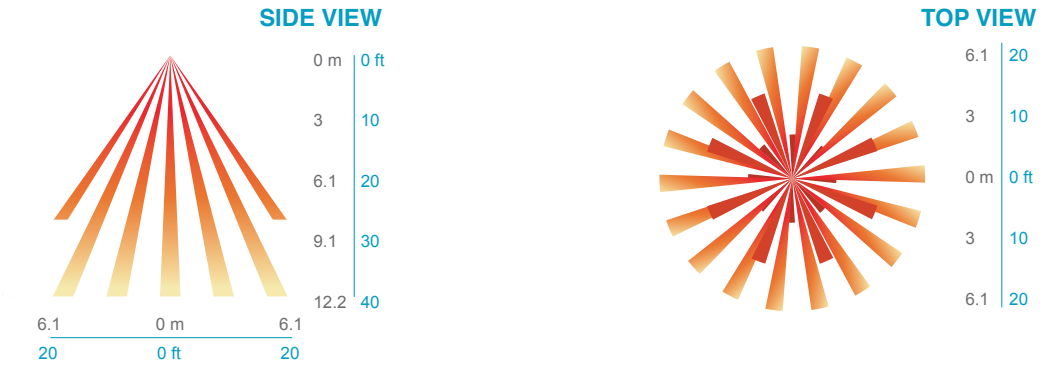
Networked Control (NLTAIR2)

nLight® AIR is a wireless lighting controls platform that allows for seamless integration of both indoor and outdoor luminaires. Five-tier security architecture, 900 MHz wireless communication and app (CLAIRITY™ Pro) based configurability combined together make nLight® AIR a secure, reliable and easy to use platform.

PIR



PIRH



Option	Dim Level	High Level (when triggered	Photocell Operation	Motion Time Delay	Ramp-down Time	Ramp-up Time
PIR or PIRH	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
PIR1FC3V, PIRH1FC3V	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 1fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
NLTAIR2 PIR, NLTAIR2 PIRH (out of box)	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	7.5 min	5 min	Motion - 3 sec Photocell - 45 sec

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Mounting, Options & Accessories



NLTAIR2 PIR – nLight AIR Motion/Ambient Sensor

D = 7″

H = 11″

W = 11.5″

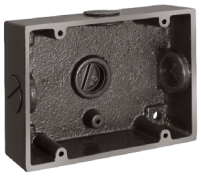


PBBW – Premium Back Box

D = 1.75″

H = 9″

W = 11.5″



BBW – Standard Back Box

D = 1.5″

H = 4″

W = 5.5″



AWS – 3/8inch Architectural Wall Spacer

D = 0.38″

H = 4.4″

W = 7.5″

FEATURES & SPECIFICATIONS

INTENDED USE
Common architectural look, with clean rectilinear shape, of the WDGE LED was designed to blend with any type of construction, whether it be tilt-up, frame or brick. Applications include commercial offices, warehouses, hospitals, schools, malls, restaurants, and other commercial buildings.

CONSTRUCTION
The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP66 rating for the luminaire.

FINISH
Exterior painted parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS
Well crafted reflector optics allow the light engine to be recessed within the luminaire, providing visual comfort, superior distribution, uniformity, and spacing in wall-mount applications. The WDGE LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L91/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire comes with built in 6kV surge protection, which meets a minimum Category C low exposure (per ANSI/IEEE C62.41.2).

INSTALLATION
A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The 3/8″ Architectural Wall Spacer (AWS) can be used to create a floating appearance or to accommodate small imperfections in the wall surface.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP66 rated. PIR options are rated for wet location. Rated for -40°C minimum ambient.
DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY
5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/support/customer-support/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

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BLADE

Vandal Resistant

BLD LED



WALL MOUNT /
MULLION MOUNT LED

Fixture Type

Date

Job Name

Approved By

Catalog Number

SPECIFICATIONS

Description The Blade combines a sleek, patent pending design shaped with high performance, full cut off optics to achieve unobtrusive illumination of a space or path of egress. When mounted overa doorway or mullion, the fixture is perceived as an element of the building structure, and, additionally, provides water protection in the form of a drip cap over the entranceway. Multiple lengths are available to match a given door opening and our quick-mount system facilitates installation and maintenance.

Housing Marine grade heat treated extruded aluminum.
Chemically primed and finished with robotically applied polyester powder coat.

Wall Mount Marine grade heat treated extruded aluminum. Chemically primed and finished with robotically applied polyester powder coat. Designed to provide quick mounting to housing and secured with (2) captive stainless steel TORX® head screws.

Lens Frame Marine grade heat treated extruded aluminum.
Secured to fixture (4) captive stainless steel TORX® head screws.

Lens UV stabilized diffused extruded polycarbonate.

End Plate Die-cast marine grade aluminum.
Chemically primed and finished with robotically applied polyester powder coat.

Drivers Constant current drivers at 700mA.

LED Samsung LM561B+ Series @ 2700K, 3000K, 3500K, 4000K, or 5000K and 82 CRI wired in parallel-series. L_{70} projected life of 130,000 hours at 50ºC. Tested in accordance with LM-80. Ten year warranty on LED boards against operational defects.

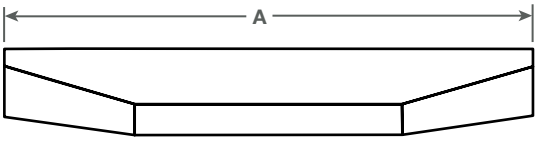
Gaskets Closed cell self-adhesive neoprene to provide watertight seal between fixture and mounting surface.

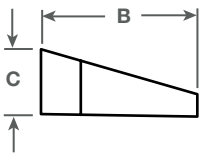
UL Listing U.L., C.UL., Wet standard.

Lifetime Warranty Luminaire LED Incorporated will repair or replace any fixture damaged due to vandalism for the lifetime of the installation.

DIMENSIONAL DATA

	A	B	C
BLD 12	20.0”	5.6”	2.4”
BLD 24	30.8”	5.6”	2.4”
BLD 36	41.6”	5.6”	2.4”
BLD 48	52.4”	5.6”	2.4”
BLD 72	74.0”	5.6”	2.4”





Luminaire Led
a division of the LUMINAIRES GROUP

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Edison, NJ 08818

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P. 732.549.0056

Luminaire LED Incorporated products are manufactured in the USA with components purchased from USA suppliers, and meet the Buy American requirements under the ARRA. Content of specification sheets is subject to change; please consult our website for current product information.

Rev: 03/19+

ORDERING INFORMATION

SERIES	LED	CCT	VOLTS	DRIVER	LENS	COLOR	OPTIONS		TX/SD
									TX/SD
BLD 12	5W	2700K	120-277	CC	DP	BLK	DIM	EMB10ST	
	10W	3000K		DIM		BRZ	2B	EMB310	
BLD 24	10W	3500K		PRD		SIL	PC	EMB310ST	
	20W	4000K				WHT	PC BT	EMB20R	
BLD 36	15W	5000K				CUST	GLR	EMB125R	
	30W						OCC	EMB250R	
BLD 48	20W						OCC50	EMBDA	
	35W						KO	ST/SC	
BLD 72	30W								
	55W								
	PRD - Specify Watts or Lumens Above								

CC = Constant Current (Standard)
DIM = 0-10V Dimming, 10% at lowest level
PRD = Programmable driver. Specify Watts or Lumens under “LED” in Ordering Information. N/A with BLD 12.

Luminaire LED Incorporated products are manufactured in the USA with components purchased from USA suppliers, and meet the Buy American requirements under the ARRA. Content of specification sheets is subject to change; please consult our website for current product information.

OPTIONS

LENS	DP = Diffused Polycarbonate.
COLORS	BLK = Black BRZ = Bronze SIL = Silver WHT = White CUST = Custom Color (Consult Factory)
DIM	0-10V dimming driver. 10% at lowest level. N/A with BLD 12.
PC	Photoelectric switch. N/A with 2B option or any EMB options.
PC BT	Bluetooth connected daylight harvesting photocell mounted in machine hole in lens frame. Optional passive infrared occupancy sensor. N/A with EMB options in BLD 12, BLD24, and BLD36.
2B	(2) LED drivers for independent LED board operation. N/A with BLD 12, N/A with OCC options, N/A with EMB310, N/A with EMB310ST.
GLR	Fuse and fuse holder.
OCC	Passive infrared sensor mounted in machine hole in lens frame for on/off operation. Maximum coverage of 10' radius from 8' height. N/A with BLD 12.
OCC50	Passive infrared sensor mounted in machine hole in lens frame. 50% of LED's constantly on and 50% sensored. N/A with BLD 12 and BLD 24.
KO	1/2" knock out in both end plates.
EMB10ST	1000 lumen self-testing, self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Not available in 347V. Available for BLD24, BLD36, BLD48, and BLD72 lengths only. N/A with 2B option in BLD24. Meets CA Title 20 Standards.
EMB310	1000 lumen self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Available for BLD36, BLD48, and BLD72 lengths only. Meets CA Title 20 standards.
EMB310ST	1000 lumen self-testing, self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Available for BLD36, BLD48, and BLD72 lengths only. Meets CA Title 20 Standards.
EMB20R	Remote mounted micro inverter that will operate a 25W maximum load for 90 minutes. 0ºC (32ºF) to 45ºC (113ºF).
EMB125R	Remote inverter that will operate a 125W maximum load for 90 minutes. 20ºC (68ºF) to 30ºC (86ºF). Not available in 347V.
EMB250R	Remote inverter that will operate a 250W maximum load for 90 minutes. 20ºC(68ºF) to 30ºC (86ºF). Not available in 347V.
EMBDA	Two drivers and two emergency battery packs self-contained within fixture for independent light engine operation. Each battery pack will operate each light engine for a minimum of 90 minutes. Available in the BLD 72 only.
ST/SC	Slotted screws instead of TORX® head.
TX/SD	TORX® head bit.

PHOTOMETRIC DATA

Model	Watts	Input Watts		Delivered Lumens									
				2700K		3000K		3500K		4000K		5000K	
BLD 12	5W	6.5W		447		452		461		476		490	
BLD 12	10W	11.8W		875		885		903		931		958	
BLD 24	10W	10.6W		962		973		993		1024		1055	
BLD 24	20W	21.3W		1885		1907		1946		2006		2066	
BLD 36	15W	14.7W		1444		1461		1491		1537		1583	
BLD 36	30W	29.6W		2828		2860		2919		3009		3099	
BLD 48	20W	19.6W		1926		1948		1987		2049		2111	
BLD 48	35W	36.4W		3770		3812		3890		4011		4132	
BLD 72	30W	29.4W		2969		3003		3064		3159		3254	
BLD 72	55W	57.1W		5789		5855		5974		6184		6345	
BLD xx	PRD			Programmable Driver. Must specify Watts or Lumens in Ordering Information.									

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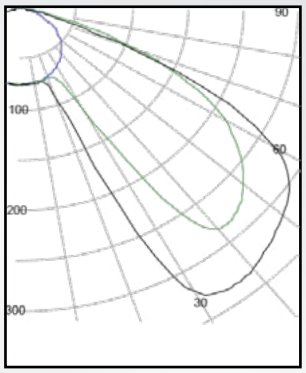
MODEL: BLD12-5W-4000K
Delivered Lumens: 476 Lumens

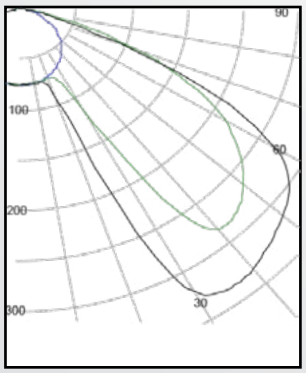


IES FILE: BLD12-5W-4000K
Total Power: 7W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B0U0G1

Zone	Lumens	% Luminaire
0 - 30	69	14.5
0 - 40	149	31.1
0 - 60	359	75.5
60 - 90	117	24.5
0 - 90	476	100.0
90 -180	0	0.0
0 - 180	476	100.0

MODEL: BLD36-15W-4000K
Delivered Lumens: 1537 Lumens

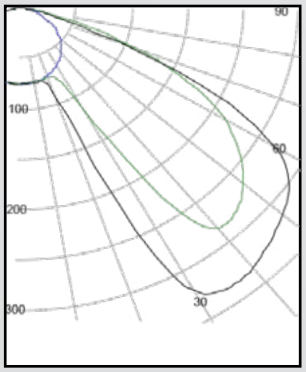


IES FILE: BLD36-15W-4000K
Total Power: 14.7W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B0U0G1

Zone	Lumens	% Luminaire
0 - 30	377	124.5
0 - 40	640	41.6
0 - 60	1219	79.3
60 - 90	317	20.7
0 - 90	1537	100.0
90 -180	0	0.0
0 - 180	1537	100.0

MODEL: BLD36-30W-4000K
Delivered Lumens: 3009 Lumens



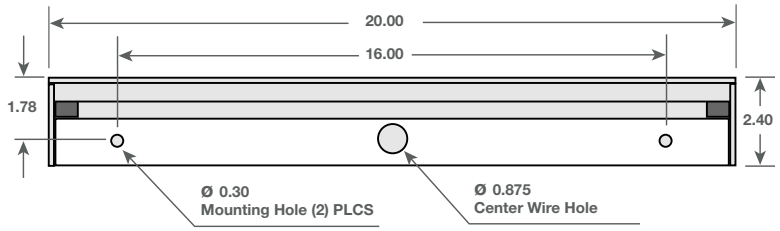
IES FILE: BLD36-30W-4000K
Total Power: 29.6W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B1U0G1

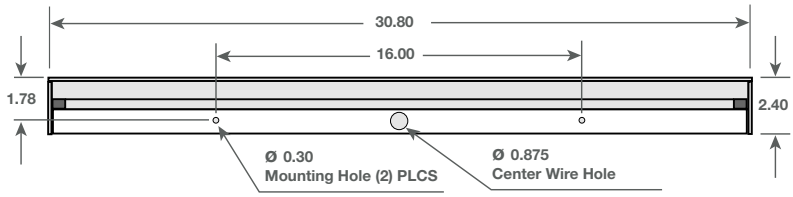
Zone	Lumens	% Luminaire
0 - 30	739	24.6
0 - 40	1253	41.6
0 - 60	2387	79.3
60 - 90	622	20.7
0 - 90	3009	100.0
90 -180	0	0.0
0 - 180	3009	100.0

MOUNTING DETAIL

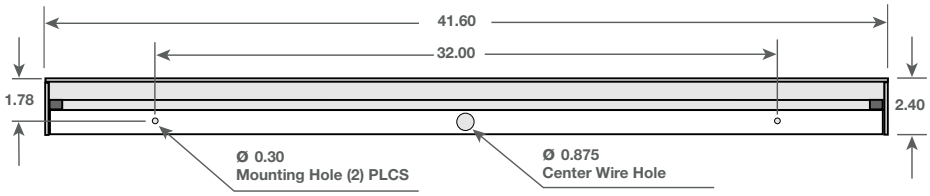
BLD12



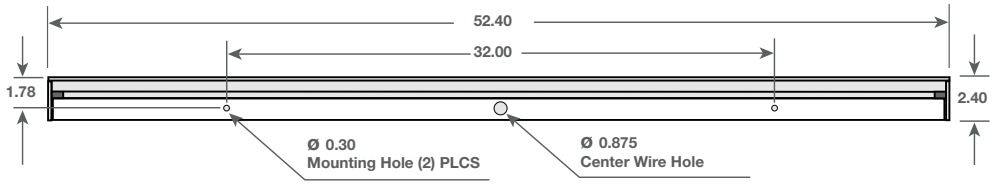
BLD24



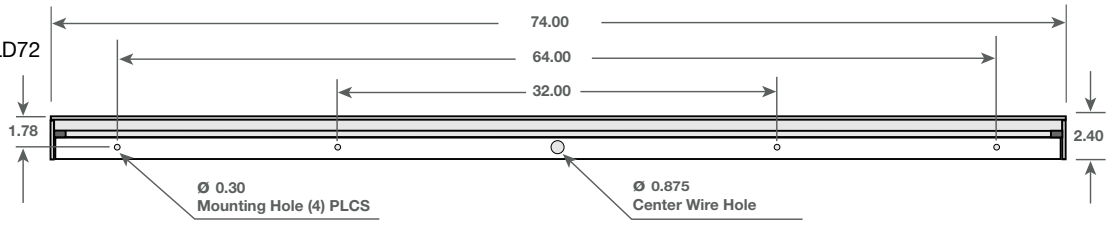
BLD36



BLD48



BLD72



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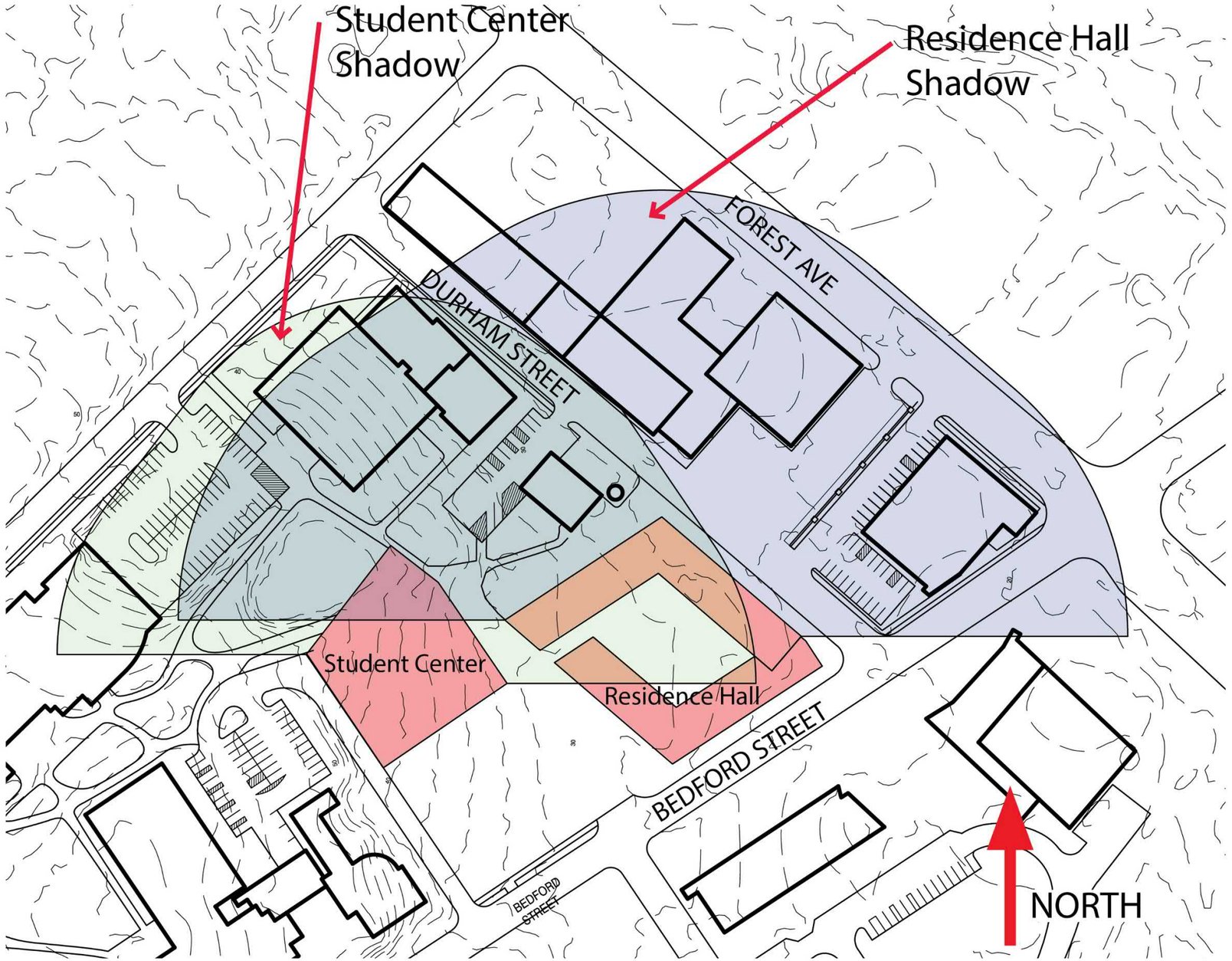
Preliminary Shadow Analysis: A preliminary shadow analysis shall be require for all Level II or Level III Developments or additions to structures greater than 45 ft tall, in order to determine if additional shadow analysis is required.

a) Shadow Length: The longest shadow that any structure will cast in Portland, Maine during the year (except within an hour of sunrise or sunset) is 4.26 times its height. To conduct a preliminary analysis multiply this factor by height of each proposed structure.

85' @ Residence Hall (tallest allowed)
85x 4.26 = 362.1'

65' @ Student Center (as designed)
65x4.26 = 276.9'

Shadows shown reflect solid masses at heights indicated. Actual design will be stepped and reduce shadow impacts.



PRELIMINARY SHADOW STUDY

USM RESIDENCE HALL &
STUDENT CENTER

PORTLAND, MAINE

01/27/2020

UNIVERSITY OF SOUTHERN MAINE · CAPSTONE DEVELOPMENT PARTNERS LLC · WOODARD &CURRAN · ELKUS | MANFREDI ARCHITECTS · SMRT



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Specifications

Generator Set Specifications	
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Generator Set Configurations	
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Engine Specifications		
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Benefits & Features

Cat® Diesel Engine

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Cat EMCP Control Panel

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Seismic Certification

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Design Criteria

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UL 2200/CSA □ Optional

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Single-Source Supplier

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Worldwide Product Support

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Standard Equipment

Air Inlet

- Single element Air filter

Cooling

- Radiator and cooling package complete with protective guard
- Standard ambient temperature capability to 50°C (122°F)

Exhaust

- Exhaust manifold outlet

Fuel

- Primary and secondary fuel filters
- Fuel priming pump
- Flexible fuel lines

Generator

- Matched to the performance and output characteristics of Cat engine
- Load admittance model provides engine response on load acceptance and provides load acceptance and recovery time
- 12 lead reconnection
- Integrated voltage Regulation

Governor

- Electronic Governor ADEM A4

Control Panels

- EMCP 4.2 Series Generator Set Controller

Mounting

- Resilient isolator

Starting/Charging

- 12 volt starting motor
- Battery trays and cables

General

- Paint is Caterpillar yellow except radiator core and guard

Optional Equipment

Exhaust

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Generator

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Starting/Charging

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General

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C4.4
80 ekW/ 100 kVA/ 60 Hz/ 1800 rpm/ 480V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)



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D80-8
80 ekW/ 100 kVA
60Hz/ 1800 rpm/ 480V

Package Performance	
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Fuel Consumption		
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Cooling System[1]		
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Rad□ator Coo□ant Ca□a□t□	10□0 □	2□6 □a□
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A□ □o□ Re□tr□□t□on (□□□te□)	0□12 □□a	0□48 □n□□ater

Inlet Air		
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Exhaust System		
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C4.4
80 ekW/ 100 kVA/ 60 Hz/ 1800 rpm/ 480V/ 0.8 Power Factor

Rating Type: STANDBY **Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)**

Heat Rejection		
Heat Re□e□tion to Coo□ant (total)	47□9 □□	2724 □t□/□ n
Heat Re□e□tion to □x□a□□t (total)	□7□7 □□	4419 □t□/□ n
Heat Re□e□tion to At□ o□□□ere □ro□ □n□ne	13.5 □□	768 □t□/□ n
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Alternator[2]		
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□ra□e	□C□114D	
Te□ □erat□re R□□e	105□C	18□□□
□x□tat□on	□e□□x□ted	

Lube System		
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Emissions (Nominal)[3]	
NOx □ HC	3.6 □/□□ □□r
CO	0.9 □/□□ □□r
□M	0.12 □/□□ □□r

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Rating Type: STANDBY **Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)**

DEFINITIONS AND CONDITIONS

Applicable Codes and Standards:
A□1□5□□C□A C22□2 No 100□04□□□142□□□48□□□□601□□□86□□□□2200□N□□A □□□N□□A □0□N□□A □□□□ N□□A 110□□□C□□□C600□4□1□□□O□046□□□O8528□N□MA M□ 1□22□N□MA M□ 1□□□□□□2/2□/□□C□□8/□□/□C□ 2004/108/□C□

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Picture shown may not reflect actual configuration

Weather Protective and Sound Attenuated Enclosures

D40 to D60
D80 to D100
D125 to D200

Features

Highly Corrosion Resistant construction

- Stainless steel flush fitting latches and hinges tested and proven to withstand extreme conditions of corrosion
- Zinc plated or stainless steel fastener

Excellent Access

- Single side access for service and controls
- All non-service sides have removable doors and/or panels
- Radiator fill access
- Lube oil and coolant drains piped to the exterior of the enclosure base
- Large cable entry area for installation ease
- Double doors on both sides
- Vertically hinged doors with solid bar door stays to hold doors in place when open

Security and Safety

- Lockable access doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill, and battery can only be reached via lockable access
- Stub-up area is rodent proof

Transportability

- These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites. The sound deadening material is of a self-extinguishing design
- This range of enclosures are designed on modular principles with many interchangeable components permitting on site repair

Options

- Weather Protective - constructed with 16 gauge steel; industrial silencer mounted within the main enclosure body
- Sound Attenuated Level 1 - constructed with 16 gauge steel; weather protective with critical silencer - silencer mounted in separate upward discharging radiator hood
- Sound Attenuated Level 2 - constructed with 16 gauge steel; weather protective with critical silencer and 100% lined with sound deadening material – silencer mounted in separate upward discharging radiator hood
- Sound Attenuated Aluminum constructed with 14 gauge Aluminum 5052 grade. Weather protective with critical silencer and 100% lined with sound deadening material – silencer mounted in separate upward discharging radiator hood
- Caterpillar Yellow* or white paint
- UL Listed sub base tanks
- Externally mounted emergency stop button
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010
- IBC certification for 180 mph wind loading

*Not available with Aluminium enclosures

Enclosure Sound Pressure Levels (SPL) at 100%

Weather Protective Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D40 (2/4)	40	1.7	3602	85
D50 (2/4)	50	1.7	3602	86
D60 (2/4)	60	1.9	4026	88
D80-8	80	3.2	6696	79
D100-8	100	3.6	7564	81
D125-8	125	4.6	9676	78
D150-10	150	4.6	9676	79
D175-4	175	5.9	12431	84
D200-2	200	5.9	12431	89

SA Level 1 Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D40 (2/4)	40	1.7	3602	66
D50 (2/4)	50	1.7	3602	66
D60 (2/4)	60	1.8	3899	71
D80-8	80	3.2	6696	78
D100-8	100	3.2	6696	79
D125-8	125	4.2	8899	74
D150-10	150	4.2	8899	74
D175-4	175	5.6	11830	78
D200-2	200	5.5	11654	81

SA Level 2 Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D80-8	80	3.2	6696	75
D100-8	100	3.2	6696	76
D125-8	125	4.2	8899	74
D150-10	150	4.2	8899	74
D175-4	175	5.2	11018	74
D200-2	200	5.1	10806	75

SA Aluminum Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D80-2	80	3.2	6696	73
D100-8	100	3.2	6696	74
D125-8	125	4.2	8899	74
D150-10	150	4.2	8899	75
D175-4	175	5.2	11018	75
D200-2	200	5.1	10806	75

The sound pressure level data shown above is quoted as free field and is forguidance only.
Actual levels produced may vary according to site conditions.

Enclosure Dimensions and Weights

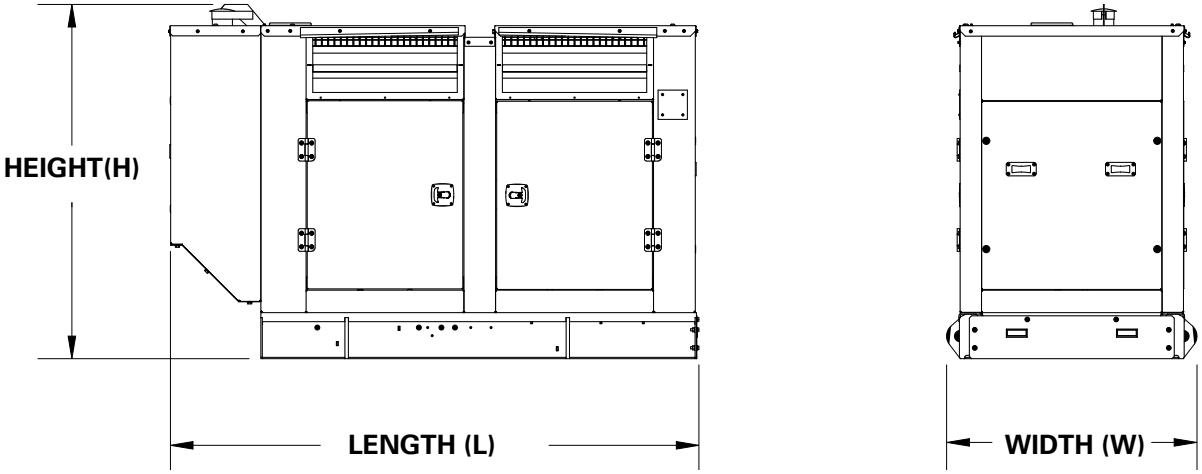

Image represents SA Level 1, SA Level 2 and SA Aluminum enclosures on skid base only

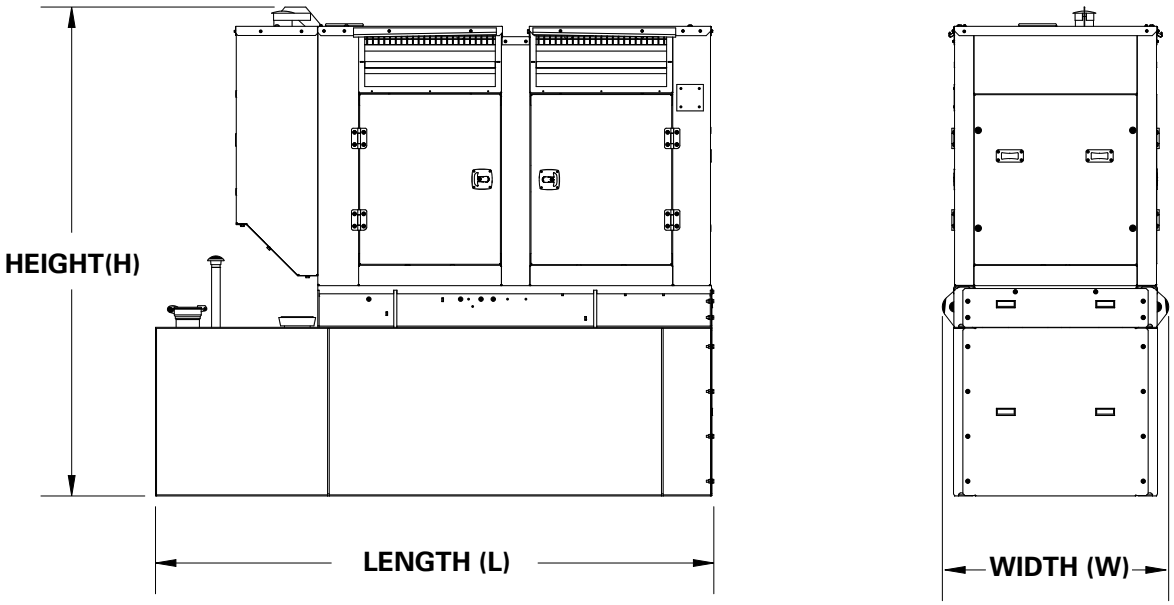

Image represents SA Level 1, SA Level 2 and SA Aluminum enclosures mounted on optional UL listed sub base tank

Model	Standby eKW	WP Industrial		SA Level 1		SA Level 2		SA Aluminum	
		kg	lb	kg	lb	kg	lb	kg	lb
D40-2	40	121	267	137	302	NA	NA	NA	NA
D50-2	50								
D60-2	60								
D80-8	80	263	580	313	690	321	708	142	312
D100-8	100								
D125-8	125	348	768	393	867	406	896	176	387
D150-10	150								
D175-4	175								
D200-2	200								

Enclosure weights (includes muffler)

Enclosure Dimensions Skid Bases

Engine Model	Generator Set Rating ekW	Enclosure	Width 'W'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in
C4.4	40	WP	1075	42.3	1972	77.6	1378	54.3
	50							
	60							
	40	SA Level 1, SA Level 2 and SA Aluminum	1075	42.3	1972	77.6	1378	54.3
	50							
	60							
C4.4	80	WP	1110	43.7	2523	99.3	1773	69.8
	100							
	80	SA Level 1, SA Level 2 and SA Aluminum	1110	43.7	2891	113.8	1852	72.9
	100							
C7.1	125	WP	1110	43.7	3204	126.1	1773	69.8
	150							
	175							
	200							
	125	SA Level 1, SA Level 2 and SA Aluminum	1110	43.7	3659	144.1	1852	72.9
	150							
	175							
	200							

Enclosure Dimensions on UL Listed Sub Base Tanks

Engine Model	Generator Set Rating ekW	Enclosure	137 Gallon Sub Base Tank				255 Gallon Sub Base Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C4.4	40	WP	2503	98.5	1912	75.3	2503	98.5	2241	88.2
	50									
	60									
	40	SA Level 1, SA Level 2 and SA Aluminum	2503	98.5	1912	75.3	2503	98.5	2241	88.2
	50									
	60									

Engine Model	Generator Set Rating ekW	Enclosure	209 Gallon Sub Base Tank				394 Gallon Sub Base Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C4.4	80	WP	3447	135.7	2258	88.9	3447	135.7	2608	102.7
	100									
	80	SA Level 1, SA Level 2 and SA Aluminum	3447	135.7	2337	92.0	3447	135.7	2687	105.8
	100									

Engine Model	Generator Set Rating ekW	Enclosure	402 Gallon Sub Base Tank				777 Gallon Sub Base Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C7.1	125	WP	4035	158.9	2420	95.3	5035	198.2	2706	106.5
	150									
	175									
	200									
	125	SA Level 1, SA Level 2 and SA Aluminum	4035	158.9	2499	98.4	5035	198.2	2785	106.5
	150									
	175									
	200									

Note: Weight includes oil and coolant but not fuel

Ref: WPIA, WPIB, WPIC, SATCBA, SATCBB, SAT, CBC, SATFBA, SATFBB, SATFBC, ENCAL02, ENCAL03, ENCAL04.

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10. CONSISTENCY WITH USM DESIGN PRINCIPLES AND STANDARDS

The *University of Southern Maine Campus and Design Principles and Standards* were created in recognition of the need of the university to grow in a vibrant, aesthetic, and sustainable manner that provides a strong sense of place and conveys an identity as a high-quality institution of learning.

All new buildings shall be designed to create a visual connection with existing campus buildings with a goal of achieving a cohesive campus appearance. New development shall be characterized by excellence in architectural design, craftsmanship, materials, streetscape and landscape improvements, signage and lighting appropriate for a university in an urban setting in the Northeast.

These principles and standards were intended to regulate the future build out of the institution while ensuring that new development is sensitive to adjacent residential neighborhoods and commercial areas and is successfully integrated with the City as a whole.

10.1 Applicability

The principles and standards apply to all development on the University of Southern Maine Portland campus. The following summarizes how the proposed project addresses each of the principles and standards found in the USM Campus and Design Principles and Standards.

10.2 Principles and Standards

Principle A Campus Design

Standard A-1: Campus Edges.

The Residence Hall is designed to coordinate with the existing buildings on campus and context by utilizing a 5-story portion along Bedford Street and an 8-story portion on Durham Street. The 5-story portion relates to the Osher Map Library, Muskie School, and Masterson Hall in Scale and Proportion. The 8-story portion, which returns into USM's Campus half way up Durham Street, creates a transition point for the campus to scale down towards the residential structures on Falmouth street while at the same time acknowledging the development of Forest Avenue and allowed building heights of future development. Career and Student Success Center is located in the heart of the campus and only defines internal campus edges.

Standard A-2: Building Orientation

The Career and Student Success Center and Residence Hall are designed to create a new Campus Quad along Bedford street as well as a courtyard within the Residence Hall. The five-story portion of the building along Bedford street allows for natural light from the south to enter the courtyard of the Residence Hall. This also allows the quad to feel more open and bright at all times of day.

Standard A-3: Pedestrian Environment

The Residence Hall's primary entrance is located on Bedford Street and will have a high level of transparency into the inner courtyard. We have brought the sidewalk up to the edge of the building to allow for more plantings and trees between the street and pedestrian sidewalk. The sidewalk transitions into the pedestrian pathways along the periphery of the quad and feeds into the campus. The Student Center faces the new quad with a formal covered portico that runs the entire length of the building, facing south. The portico stitches together pre-established campus circulation patterns from the west through Masterton Hall and terminates in the courtyard of the new Residence Hall to the east. Additional circulation patterns at the east

and west edges of the new residential quad will provide an appealing approach to the Student Center. In addition to providing protection from the weather the portico shields the large glass wall of the southern façade from solar heat gain. Framed with a mass timber and cross laminated timber structural system, the portico and large interior spaces are visually warm and inviting. Driven by ambitious sustainability goals, the aesthetic of the building - board formed concrete, large steel-framed walls of glass, corrugated metal and fiber cement siding - is rooted in the material palette of the campus and the nature of Maine in the broader context.

Standard A-4: Gateways

The Residence Hall is at the corner of Bedford and Durham Street and is designed to enhance the gateway into the campus. This is achieved through relating to the context buildings across the street and the use of different materials on the facade to create a more distinct "Gateway".

Standard A-5: Views and Landmarks

The five-story portion of the Residence Hall along Bedford Street utilizes the same size and scale of the existing buildings which will help maintain the views and feel of the street. The replacement of the surface parking lot with green space highlights views in and out of campus by creating a space that allows engagement with the surrounding context. The Career and Student Success Center is establishing itself as a new landmark in the heart of campus.

Principle B Access and Circulation

Standard B-1: Connectivity

The CSSC, Residence Hall, and new Campus Quad enhance and add to the existing connectivity within the campus and relates to the goals of the USM Facilities Masterplan.

Standard B-2: Circulation

The entrances and exits of both buildings highlight existing access points within the USM circulation system as well as define new spaces with a higher level of clarity and safety than the previous surface parking lot did.

Standard B-3: Multi-modality

The circulation plan is pedestrian oriented at all levels and measures have been taken to eliminate pedestrian and vehicular crossings within the campus. The existing bus stop will remain and is integrated into the new Quad with accessible routes accessing the new buildings.

New bike storage areas for both buildings will be provided to enhance biking to and around campus.

Standard B-4: Traffic Calming

The pedestrian environment is the focus of this design and measures have been taken to enhance this and create a higher level of safety for pedestrians by limiting pedestrian and vehicular interaction.

Standard B-5: Sidewalks

New sidewalks will be installed along Bedford Street and are greater than 8' in width. Durham Street is not as heavily travelled and will utilize a 6' sidewalk.

Standard B-6: Street Lights

Streetlights will be in line with what has been recently installed on Bedford Street.

Principle C Parking, Loading and Service Areas

Standard C-1,C-2,C-3: Parking Structures

There are no parking structures included with this application. A separate Level III Site Plan application will be submitted for a parking structure on campus.

Standard C-4: Surface Lots

The existing Surface Lot off of Durham street will be repaved and expanded for the new service area.

Standard C-5: Loading and Service Areas

All loading and service areas are consolidated behind the CSSC and Residence Hall and accessed via Durham Street. The goal of centrally locating these facilities was to create clear and distinct separation from the pedestrian circulation within campus and concealed from public view.

Standard C-6: Utility Services

All utilities are located adjacent to the loading and service areas out of public view and access.

Principle D Architectural Design

Standard D1: Height

The Residence Hall building is broken down into two distinct wings, a five-story portion along Bedford Street and an eight-story portion along Durham Street with both wings returning into the campus. The eight-story portion of the building will be in accordance to the USM Overlay Map of 85' in height or less. The CSSC is located in the heart of the campus and will be three stories tall and under the allowed height per USM Overlay map.

Standard D-2: Setbacks

The Residence Hall is set back 10' from the Property Line on Bedford Street and 4' from Durham Street.

Standard D-3: Stepbacks

We understand that this is not applicable to these projects based on initial conversations with the City.

Standard D-4: Massing

Facades along Bedford and Durham Street of the Residence Hall utilize a Masonry and glass base. The Bedford portion transitions to a primarily masonry/brick façade with portions of cementitious panel inlays to gang windows together. This breaks down the scale of the facade and relates to the vertical fenestration of the Osher Map Library and Muski School Across the street. The eight-story portion along Durham Street Transitions to a metal and cementitious panel cladding system that runs primarily in a horizontal pattern to help mitigate the height of the building. The horizontal bands gang windows and units to help reduce the perception of the horizontal length of the building. The CSSC helps transition the eight-story massing of the Residence Hall to the existing Buildings on campus.

The programming along the ground floors allow for no more than 20 consecutive linear feet of blank walls along public ways.

Standard D-5: Entrances

The Residence Hall's primary entrance is located off of Bedford Street with limited entrances other than for emergency egress for security purposes along the perimeter. The primary entrance for the CSSC faces Bedford street and overlooks the Quad. This entrance is connected to the new and existing pedestrian circulation paths. There is another entrance to the CSSC located on the north west corner that connects with the central pedestrian path within the campus.

Standard D-6: Windows

Unit Windows within the residence Hall will likely meet Passive House Standards with a U-value of .14-.11, surpassing most high-performance window systems. The storefront systems will be upgraded to triple pane to meet Passive House standards as well. We have utilized transparency along Bedford street, but less on Durham since these are residential units. We are coordinating the percentage of window opening with our Passive House consultant since this directly impacts the sustainability goals of the project.

The windows for the Career and Student Success Center will perform to LEED Silver requirements. There is significantly more glass in this building due to the program that open out to the new Quad.

Standard D-7: Materials

One of the goals of the project is to create a new vision for USM while keeping ties to the existing campus materials.

The Residence Hall is one building with two distinct wings: the five-story Bedford Wing and the eight-story Durham Wing. Both wings have a two-story masonry base which relates to several of the existing buildings on campus. The Bedford Wing will have more glazing to allow light into the common spaces and to activate the streetscape. The upper, streetside face of the Bedford wing is also masonry with metal infill panels between the windows. The courtyard side of the Bedford Wing will be a combination of cementitious and metal panels. The top six floors of the Durham Wing elevations will be cementitious and metal panels; both the streetside and the courtyard elevations.

We have reviewed the cementitious panel option with the city previously since cementitious panels have improved significantly since the design manual was written and are utilized in many LEED projects and the durability has improved significantly.

The Career and Student Success Center will utilize a similar palette with the addition of exposed heavy timber structure.

Standard D-8: Signage

Signage is still under review

Standard D-9: Historic Structures

Not applicable

Standard D-10 Original Residential Structures

Not applicable

5. EVIDENCE OF RIGHT, TITLE & INTEREST

The proposed development is located on properties owned by the Applicant and identified as Tax Map 114, Lots G-6 thru G-10; and Map 114A, lots H-5 thru H-15. Attached are copies of the deeds associated with these properties.

5.1 Attachments

- Deed, dated August 28, 1957, Cumberland County Registry of Deeds, Book 2370, Pg 135.
- Deed, dated December 24, 1964, Cumberland County Registry of Deeds, Book 2873, Pg 133.
- Deed, dated March 28, 1970, Cumberland County Registry of Deeds, Book 3121, Pg 878.
- Deed, dated October 14, 1999, Cumberland County Registry of Deeds, Book 15109, Pg 33.

(90) 135

Know all Men by these Presents,

That Portland Junior College ~~Company~~,

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of one dollar and other valuable considerations

paid by University of Maine, a corporation organized and existing under the laws of the State of Maine and located at Orono in the County of Penobscot and State of Maine

the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said University of Maine its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land with the buildings thereon situated in Portland aforesaid bounded and described as follows:

Beginning at a pipe set in the ground at the corner formed by the intersection of the easterly side of Brighton Avenue and the southerly side of Falmouth Street; thence by said southerly side of Falmouth Street in an easterly direction nine hundred eighty-two and sixty-seven hundredths (982.67) feet to a pipe set in the ground on said southerly side of Falmouth Street; thence southerly with an included angle of ninety-four degrees thirty-eight minutes (94° 38') three hundred fifty-two and eighty-nine hundredths (352.89) feet to a pipe; thence westerly on a line parallel with Falmouth Street and at an included angle of eighty-five degrees twenty-two minutes (85° 22') one hundred sixty-four and sixty-five hundredths (164.65) feet to a point, said point being on the line of a row of trees running approximately north and south; thence southwardly along the line of said row of trees two hundred forty-five (245) feet more or less to the northerly side of Bedford Street; thence westerly along the northerly side of said Bedford Street six hundred (600) feet more or less to the easterly side of Brighton Avenue; thence along the easterly side of Brighton Avenue four hundred eighty-seven and thirty-eight hundredths (487.38) feet more or less to the point of beginning.

Reference is made to three deeds to Portland University Extension Courses, Inc., the name of which, subsequently, by act of the Legislature has been changed to Portland Junior College, and a fourth deed to Portland Junior College, all from Edward Deering Noyes dated and recorded as follows: December 28, 1946, Book 1854 Page 424, June 30, 1947, Book 1875 Page 227, July 1, 1948, Book 1916 Page 364, and December 31, 1956, Book 2332 Page 151.

Portland Junior College to University of Maine -- War

Vogel

to

University of Maine

-

War

Know all Men by these Presents, That

I, BEATRICE N. VOGEL, of Falmouth, County of Cumberland and State of Maine, formerly known as Beatrice M. Noyes,

in consideration of one dollar and other valuable consideration s paid by UNIVERSITY OF MAINE, an educational corporation organized and existing under the laws of the State of Maine,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said University of Maine, its successors and assigns forever, a one-third (1/3) interest in common and undivided in and to a certain lot or parcel of land situated on the southwesterly side of Durham Street, City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the southwesterly side of Durham Street at the most northerly corner of land now or formerly of Allan G. Ballard, et al, which corner is situated one hundred eighty-two and eleven hundredths (182.11) feet, northwesterly of Bedford Street as measured along said southwesterly side of Durham Street; thence southwesterly by land of said Ballard and by land of International Harvester Co. a distance of one hundred (100) feet, more or less, to other land of said International Harvester Co.; thence northwesterly by said other land of international Harvester Co. a distance of one hundred twelve (112) feet, more or less, to land now of the University of Maine; thence northeasterly by land of the University of Maine one hundred (100) feet, more or less, to Durham Street; thence southeasterly by Durham Street a distance of one hundred twelve (112) feet, more or less, to the point of beginning.

Being a portion of the premises conveyed by James D. Fessenden, et al, to Nathaniel Deering, et als, dated January 21, 1879, recorded in the Cumberland County Registry of Deeds, Book 455, Page 49.

This conveyance is made subject to and with the benefit of a lease of the above described premises from Edward Deering Noyes, Jr., as Lessor to International Harvester Co. as Lessee dated September 9, 1947.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said University of Maine, its successors and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances except as aforesaid, that I ha ve good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, I, Beatrice N. Vogel, and I, Leo G. Vogel, husband of the said Beatrice N. Vogel,

joining in this deed as Grantor, and relinquishing and conveying my rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 24th day of December in the year of our Lord one thousand nine hundred and sixty-four

Signed, Sealed and Delivered in presence of

Robert B Long
Robert B Long

Beatrice N Vogel
Leo G Vogel

State of Maine, CUMBERLAND ss. December 24, 1964.

Personally appeared the above named Beatrice N. Vogel

and acknowledged the foregoing instrument to be her free act and deed.

Before me, H. Dawson Osgood
NOTARY PUBLIC.
MY COMMISSION EXPIRES SEPTEMBER 6, 1968

STATE OF MAINE, CUMBERLAND COUNTY, SS. *REGISTRY OF DEEDS*

Received DEC 30 1964 *at* 3 o'clock 30 *m.* P *M., and recorded in BOOK* 2873 *PAGE* 133 *Attest:* Howard P. Thomson *Register.*

378

4111 (90)

Know all Men by these Presents,

That FOREST CITY CHEVROLET ~~COMPANY~~ Company

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of One Dollar ($1.00) and other valuable considerations,

paid by UNIVERSITY OF MAINE, a body politic and corporate, organized under the laws of the State of Maine,

the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said University of Maine, its successors

~~heirs~~ and assigns forever,

a certain lot or parcel of land together with any improvements thereon situated on the northwesterly side of Bedford Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the northwesterly side of Bedford Street with the southwesterly side of Heywood Street; thence southwesterly by Bedford Street two hundred forty-three (243) feet, more or less, to land of University of Maine, being the land conveyed by Edward D. Noyes to Portland Junior College by deed dated December 31, 1956 and recorded in the Cumberland County Registry of Deeds, Book 2332, Page 151; thence northwesterly by said land of University of Maine two hundred forty-five (245) feet, more or less, to other land of University of Maine, being the land conveyed by Edward D. Noyes to Portland University Extension Courses, Inc. by deed dated July 1, 1948 and recorded in said Registry of Deeds, Book 1916, Page 364; thence northeasterly by said other land of University of Maine one hundred sixty-three (163) feet, more or less, to land of University of Maine, being the same land conveyed by Edward D. Noyes to it by deed dated April 9, 1958 and recorded in said Registry of Deeds, Book 2404, Page 15; thence southeasterly by said land and by an extension southeasterly of the line of said land which is the southwesterly side of Heywood Street three hundred (300) feet, more or less, to Bedford Street and the point of beginning.

Being the same premises conveyed to Forest City Motor Co. by deed of Beatrice M. Noyes and by deed of Canal National Bank, et al, as Trustees under the Will of Edward Deering Noyes, Jr. both deeds dated May 18, 1964, recorded in Cumberland County Registry of Deeds, Book 2821, Pages 354 and 346 respectively. The grantor herein is the successor in interest to said Forest City Motor Co. by change of corporate name duly recorded in said Registry of Deeds.

0075689 BK15109PG033

WARRANTY DEED
Maine Statutory Short Form

Know all Men by these presents,

That **Gary T. Gervais**, of Portland, Cumberland County, Maine, for consideration paid, grants to **University of Maine System**, a body politic and corporate, organized and existing under the laws of the State of Maine, with a mailing address of 107 Main Avenue, Bangor, Maine 04401, with Warranty Covenants, a certain lot or parcel of land, together with the buildings thereon, situated in Portland, Cumberland County, Maine, and situated at the northwesterly corner of Bedford Street and Durham Street and bounded and described as follows:

Beginning at the intersection formed by the northerly side of Bedford Street and the westerly side of Durham Street; thence southwesterly and along the northerly line of Bedford Street 68.93 feet to an iron pipe; thence northwesterly and parallel to the westerly line of Durham Street 163.20 feet to an iron pipe; thence northeasterly and at right angles to the last course 66.33 feet to an iron pipe in the westerly line of Durham Street; thence southeasterly and along the westerly line of Durham Street 182.11 feet to the point of beginning.

Being the same premises described in a deed from Mildred L. Cohen to Robert R. Gervais, Jr., and Gary T. Gervais, dated July 25, 1980, recorded in Cumberland County Registry of Deeds, Book 4637, Page 155, and from Robert R. Gervais, Jr., to Gary T. Gervais dated March 29, 1985, recorded in said Registry, Book 6719, Page 321.

This conveyance is made subject to a lease, as may be amended, between Gary T. Gervais and University of Maine System, dated November 8, 1989, as evidenced by a Memorandum of Lease dated February 28, 1990, recorded in Cumberland County Registry of Deeds, Book 9102, Page 319. Said lease is hereby terminated.

Also hereby conveying all rights, easements, privileges, and appurtenances belonging to the premises hereinabove described.

Witness my hand this 14th day of October 1999.

Signed and Delivered in
the presence of:

Gary T. Gervais

MAINE REAL ESTATE TAX PAID

BK15109PG034

STATE OF MAINE
CUMBERLAND, SS.

October 14, 1999

Then personally appeared the above named Gary T. Gervais and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Thomas S Leahy

~~Notary Public~~/Attorney at Law

Printed Name: Thomas S. Leahy

KJT\TGL\GERVAIS\Warranty Deed.doc

RECEIVED
RECORDED REGISTRY OF DEEDS
1999 OCT 15 AM 10:44
CUMBERLAND COUNTY
John B O'Brien

To have and to hold, the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said University of Maine, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee, its/ successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;

that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Forest City Chevrolet ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Philip Gemmer, its President ~~Treasurer~~, thereunto duly authorized, this 28 TH day of MARCH in the year one thousand nine hundred and seventy.

Signed, Sealed and Delivered in presence of

Helen A. Pinder

Forest City Chevrolet

~~Company~~

By Philip Gemmer

President ~~Treasurer~~

(CORPORATE SEAL)

FOREST CITY CHEVROLET INC. 1970

State of Maine

County of Cumberland **ss.** 19 70

Then personally appeared the above named

Philip Gemmer, President ~~Treasurer~~ **of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act**

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To have and to hold, the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said

University of Maine, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee , its successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;
that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that if and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee , its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Portland Junior College ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Philip I. Milliken , its Treasurer, thereunto duly authorized, this 28th day of August in the year one thousand nine hundred and fifty-seven.

Signed, Sealed and Delivered
in presence of

Jane C. Magnusson

Countersigned
Raymond S. Rracy
President

~~Company~~.
PORTLAND JUNIOR COLLEGE
By Philip I Milliken
Treasurer.

(CORPORATE SEAL)

State of Maine

County of Cumberland ss. August 28, 1957

Then personally appeared the above named Philip I. Milliken Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me,

Jane C. Magnusson Justice of the Peace.
~~Notary Public~~

AUG 28 1957
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 12 H 27 M P.M., and recorded in
BOOK 2370 PAGE 135 Register

6. EASEMENTS AND OTHER BURDENS

There are is a bus shelter easement located on the project Site on Bedford Street, as well as a discontinued ROW for a street formerly known as Heywood Street. The easement is shown on survey prepared by SurveyWorks, Inc., and a copy of the easement is attached. The Heywood Street ROW was discontinued on My 7, 1984 and as recorded in the City of Portland Road Book, Volume 2, Page 392.

6.1 Attachments

- Easements

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4111 (90)

Know all Men by these Presents,

That FOREST CITY CHEVROLET ~~COMPANY~~ Company

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of One Dollar ($1.00) and other valuable considerations,

paid by UNIVERSITY OF MAINE, a body politic and corporate, organized under the laws of the State of Maine,

the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said University of Maine, its successors

~~heirs~~ and assigns forever,

a certain lot or parcel of land together with any improvements thereon situated on the northwesterly side of Bedford Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the northwesterly side of Bedford Street with the southwesterly side of Heywood Street; thence southwesterly by Bedford Street two hundred forty-three (243) feet, more or less, to land of University of Maine, being the land conveyed by Edward D. Noyes to Portland Junior College by deed dated December 31, 1956 and recorded in the Cumberland County Registry of Deeds, Book 2332, Page 151; thence northwesterly by said land of University of Maine two hundred forty-five (245) feet, more or less, to other land of University of Maine, being the land conveyed by Edward D. Noyes to Portland University Extension Courses, Inc. by deed dated July 1, 1948 and recorded in said Registry of Deeds, Book 1916, Page 364; thence northeasterly by said other land of University of Maine one hundred sixty-three (163) feet, more or less, to land of University of Maine, being the same land conveyed by Edward D. Noyes to it by deed dated April 9, 1958 and recorded in said Registry of Deeds, Book 2404, Page 15; thence southeasterly by said land and by an extension southeasterly of the line of said land which is the southwesterly side of Heywood Street three hundred (300) feet, more or less, to Bedford Street and the point of beginning.

Being the same premises conveyed to Forest City Motor Co. by deed of Beatrice M. Noyes and by deed of Canal National Bank, et al, as Trustees under the Will of Edward Deering Noyes, Jr. both deeds dated May 18, 1964, recorded in Cumberland County Registry of Deeds, Book 2821, Pages 354 and 346 respectively. The grantor herein is the successor in interest to said Forest City Motor Co. by change of corporate name duly recorded in said Registry of Deeds.

To have and to hold, the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said University of Maine, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee, its/ successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;

that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Forest City Chevrolet ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Philip Gemmer, its President ~~Treasurer~~, thereunto duly authorized, this 28 TH day of MARCH in the year one thousand nine hundred and seventy.

Signed, Sealed and Delivered in presence of

Helen A. Pinder

Forest City Chevrolet

~~Company~~

By Philip Gemmer

President ~~Treasurer~~

(CORPORATE SEAL)

State of Maine

County of Cumberland **ss.** 19 70

Then personally appeared the above named

Philip Gemmer, President ~~Treasurer~~ **of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act**

7. EVIDENCE OF STATE AND/OR FEDERAL APPROVALS

The following state and federal permits will be required for the proposed work:

- MaineDEP Site Location of Development Act Permit (reviewed by City of Portland under Delegated Review Authority);
- Maine Construction General Permit Notice of Intent; and
- FAA Notice of Proposed Construction.

Copies of these permit approvals can be provided to the City of Portland upon receipt.

8. EVIDENCE OF FINANCIAL & TECHNICAL CAPABILITY

8.1 Financial Capability

Attached is a copy of a letter verifying the Applicant's financial capacity to undertake the project.

8.2 Technical Capability

The University of Southern Maine (USM) is a public university with over 8,000 undergraduate and graduate students taking courses online and at campuses in Portland, Gorham and Lewiston. Known for its academic excellence, student focus and engagement with the community, USM provides students with hands-on experience that complements classroom learning and leads to employment opportunities in one of the nation's most desirable places to live. USM is a member of the University of Maine System (UMS), the State's largest educational enterprise that includes seven universities and an annual enrollment of nearly 30,000 students.

Capstone Development Partners (CDP) is a student housing real estate development company exclusively focused on working with colleges and universities in public private partnerships. The Principals of CDP have a combined experience of more than 40 years helping colleges and universities overcome real estate development and housing challenges. Their mission is unique to the student housing industry in that they focus on projects where they are in partnership with the university— rather than simply building apartments in a community with little regard for its plans, its institutional objectives or its long and short-term goals. They have built a reputation on collaborating with schools and respecting and burnishing the unique campus culture of its partners. They work hard every day to establish creative solutions that align the interests of the municipal, private and university project stakeholders, inclusive of housing and student life professionals, finance executives, presidents, facilities personnel, and the many others involved in development on or near a college campus.

Woodard & Curran (W&C), a 1,000-person Portland-based firm, has provided engineering services to the public and private sector for over 40 years, including permitting, civil/site engineering, stormwater and construction management services. W&C has completed projects for colleges, universities, and healthcare institutions that build strong, sustainable infrastructure and environmental programs serving both their business needs and the communities that make them so vibrant. With extensive experience in design and permitting for site development projects, W&C has completed many projects within the City of Portland and for the University of Maine System.

SMRT is a full-service firm of architects, engineers, planners and professionals committed to solving problems through design. Based in Portland, Maine, SMRT specializes in creating complex, 24-7 facilities for clients with challenges in education, healthcare, science/technology/industry, justice, government and workplace environments. Through collaboration, the project focus is to deliver buildings that further owner's business objectives through strong design, sustainable infrastructure and high functionality. SMRT has broad experience with projects for higher education including multiple projects for the University of Maine.

Elkus Manfredi Architects (EMA) is a full-service design firm providing architecture, master planning, urban design, interior architecture, historic preservation, space planning, programming, and experiential graphic design. EMA's portfolio of work includes a diversity of projects, including community-building higher education campus plans and facilities that create places for living, learning and innovating. The firm is at the forefront of sustainable design, with 8 of its 60 LEED projects at the Platinum-certified level. Elkus Manfredi has also signed on to the AIA's 2030 Commitment and has a rigorous process of early performance modeling to optimize design.

PC Construction (PCC) shares over half a century of industry-leading excellence with every client we meet. They offer general contracting, construction management, and design-build services to private and public companies for projects of all sizes — from a single office fit-up to water supply programs valued at over $300 million. With

headquarters in Vermont and a network of locations in Georgia, Maine, New Hampshire, New York and North Carolina, PCC manage project offices up and down the east coast and boast an annual volume average of $500 million.

Copies of resumes and project references can be provided upon request.

8.3 Attachments

- Financial Capacity Letter

UNIVERSITY OF
SOUTHERN MAINE
Finance and Administration

March 5, 2020

Mr. Darrin Stairs
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

Dear Mr. Stairs:

The University of Southern Maine expects the Career and Student Success Center (CSSC) and residence hall projects to cost approximately $96 million combined.

To fund the project, the University would utilize the following resources:

(1) For the CSSC project ($31 million), USM has at its disposal $19 million in voter-approved general obligation debt and $1 million in philanthropic contributions.

(2) For the remaining $11 million in funding required for the CSSC, as well as the $65 million total cost of the residence hall, the University of Maine System would issue revenue bonds.

Thank you for your consideration.

Sincerely,

Alexander E. Porteous
Chief Business Officer

P.O. Box 9300, Portland, ME 04104-9300
(207) 780-4484 TTY (207) 780-5646, FAX (207) 780-4549
www.usm.maine.edu
A member of the University of Maine System

11. ZONING ASSESSMENT

The project is located within two underlying City Zones. Most of the project is in the R-5 Residential Zone, with a small portion on the eastern side in B-2 Community Business Zone. The entirety of the project is in the USM Overlay Zone. The purpose of the USM Overlay zone is to allow the University to continue and reasonably expand within defined boundaries, and to recognize the unique qualities of a university campus while at the same time protecting the value and integrity of established neighborhoods. University buildings and structures are subject to the requirements of the underlying zoning districts, except as modified by the USM Overlay Zone. The Overlay Zone provides for an 85-foot building height in the portion of the campus where the new Career and Student Success Center and Residence Hall will be located, and yard setbacks of 10 feet from Bedford Street; 0 feet from Durham Street; and 20 feet from Falmouth Street.

The uses proposed for this project, generally classified as "University Uses", are permitted within the USM Overlay zone. The allowed uses include: Classrooms; Student Unions; Dining Halls; Bookstores; Auditoriums; Outdoor Use areas, such as quads and greens; student housing, Administrative and Faculty offices, and other buildings, structures and uses customarily incidental to a university.

The attached Zoning Assessment Table shows the project complies with dimensional requirements specified in the City's Land Use Ordinance.

11.1 Attachments

- City of Portland Zoning Assessment Table

ZONING ANALYSIS Relevant Zone(s) B2, R5, USM Overlay Zone

All Projects:

	Required	Proposed
Lot Size	N/A	N/A
Area Per Dwelling Unit	N/A	N/A
Minimum Street Frontage	N/A	N/A
Front Yard Minimum	Bedford St -10'	10'
Front Yard Maximum	N/A	N/A
Rear Yard	N/A	N/A
Yard Right	Durham St - 0'	0'
Yard Left	N/A	N/A
Side Street Setback	N/A	N/A
Step Back	N/A	N/A
Maximum Lot Coverage	40% (Campus)	~29% (Campus)
Minimum Lot Coverage	N/A	N/A
Maximum Height	Zone C, 85 feet	82 feet
Open Space	N/A	N/A
Maximum Impervious Area	66% (Campus)	~53% (Campus)
Pavement Setback	N/A	N/A
Floor Area Ratio	N/A	N/A
Off Street Parking Spaces	See Campus Plan	See Campus Plan
Loading Bays	determined by PB	3
Other 1		
Other 2		
Other 3		

Planned Residential Unit Developments (PRUD) Requirements (Not applicable)

	Required	Proposed
Minimum Lot Size		
Minimum Lot Area per Dwelling		
Maximum # Units per Building		
Maximum Building Length		
Maximum Accessory Building Length		
Minimum Setbacks		
Minimum Building Separation		
Minimum Open Space		

Affordable Housing Density Bonuses (if applicable) (Not applicable)

	Bonus Increase or Decrease	Maximum Allowable With Bonus	Proposed
Density			
Height			
Setback Reduction			
Recreation Space			
Maximum Accessory Building Length			
Minimum Setbacks			
Minimum Building Separation			
Minimum Open Space			
Explanatory Text 1 (optional):			
Explanatory Text 2 (optional):			
Explanatory Text 3 (optional):			

12. CONSISTENCY WITH CITY COMPREHENSIVE PLAN

The City's current Comprehensive Plan (Portland's Plan 2030) completed in 2017 articulates a vision of Portland's values and provides a framework for decision making revolving around the values, goals, and strategies of the City over the next decade. The proposed project is consistent with with Portland's Plan 2030.

12.1 Comprehensive Plan Vision Statement

Portland's Plan 2030 is guided by a vision statement for the City that includes six interconnected themes, which provide the foundation for focusing City policies and priorities identified for gauging success. The goals and implementation strategies in the Plan support the vision statement.



Figure 12-1: *Six Interconnected Themes Identified During Portland's Comprehensive Planning Process*

The Career and Student Success Center and Residence Hall projects align with all six themes of the vision statement, with focus on many of the specific points (listed below in italics) highlighted within those themes.

Equitable – *We (City) will remain an open and inclusive city, celebrating diversity and providing a welcoming and safe place for residents and visitors alike.*

The Career and Student Success Center and Residence Hall project provides connectivity to neighboring uses, welcoming residents of surrounding neighborhood. The proposed site features a Campus Quad, plaza areas, and pedestrian connections that create permeability, are welcoming to pedestrians, and provide important public access.

Sustainable – *Portland has been built and rebuilt to endure; we will balance our historic fabric, sound infrastructure, and the best of new technology and design for the future.*

Portland will grow in order to sustain our community, infrastructure, and economy.

Growth should respect and seek to preserve our spectacular natural resources.

Sustainability at the University of Southern Maine means environmental responsibility and sensitivity as well as a focus on wellbeing. Across three campuses the University strives to implement sustainable solutions that serve not only the planet locally and globally, but also the diverse university community. From careful and innovative waste management practices to energy and water conservation, from engaging students, staff, and the outside community with creative programming to integrating sustainability into the curriculum, and from responsible procurement to careful planning and execution of projects and initiatives, USM strives to lighten its carbon footprint while simultaneously enriching the learning experience for all of our students in all majors.

The University has a Strategic Sustainability Plan, developed in 2017 that was endorsed by Student Senate and the Master Planning Committee.

USM also recognizes its role in advancing regional and state economics. Through its research, academic programs, and training, the University responds to the workforce and economic prosperity imperatives of Maine's business, nonprofit organizations, and government agencies.

Dynamic – *We will embrace innovation in order for our community to thrive.*

We will welcome new residents into our community because they enrich and sustain our city

We will support healthy schools as essential to maintaining a dynamic community.

Portland will plan for a built environment that encourages an active citizenry.

Located less than one mile from the heart of downtown Portland, the Portland campus provides excellent access to social, cultural and internship opportunities. The USM Facilities Master Plan outlines the following vision for the Portland Campus: “To building a sustainable, iconic academic campus in the heart of Portland enhancing the commuter experience while creating a welcoming residential community”. USM embraces academic freedom for students, faculty, and staff, and advocates diversity in all aspects of its campus life and academic work.

Secure – *We will be committed to accessible housing and healthy food for all our residents.*

We will strive to create a resilient economy through innovation, investment, and commitment to diversity.

While Portland is a desirable place to live, competitive market conditions have created a barrier to entry for many students. USM envisions expanding its on-campus housing portfolio on the Portland campus to support students’ academic and career aspirations as well as ensure a robust student life experience. It is strategically focused on providing this student housing for upper-division (third- and fourth-year) undergraduate, graduate,

and law students. The new Career and Student Success Center and Residence Hall are instrumental in achieving this goal.

The University is committed to building a campus community where all students can fully participate and feel valued, in an educational environment that is inclusive and safe. It encourages its students to engage in the rich education and growth found through active exchange across cultures and identities. Research is a vital way for faculty and students to bridge academic scholarship and learning with helping communities create real world solutions. Through a broad range of USM research initiatives, faculty, staff, and students aim to produce results that will be usable, practical, and sustainable in the community.

Authentic – *We (City) will celebrate our city's incredible history.*

The uniqueness and integrity of our neighborhoods will be maintained and enhanced.

We will invest in and support our local economy.

We will maintain our character through preservation, innovation, and excellence in design for the built environment.

The proposed development realizes a substantial investment in the Portland campus, that will create new housing opportunities for students as well as create new welcoming space that will enhance the campus and neighborhood experience. The Career and Student Success Center, Residence Hall, and new Quad enhance and add to the existing connectivity within the campus and incorporates the goals of the USM Facilities Masterplan. The new CSSC will be a LEED certified building and the Residence Hall will be pursuing Passive House Certification. The University campus is a valuable asset to the local economy - as an employer; as a destination for students; and as a gathering place for professionals and community events.

Connected – *Our success will be tied to our connections to each other, our state, and our region.*

Diverse forums for community engagement will remain essential to a strong civil society.

We will foster accessible linkages between where we live, work, shop, and play.

This project will remain physically connected to the rest of the City and surrounding areas through street connections and pedestrian connections. The projects will enhance the campus experience, while also remaining connected to the adjacent neighborhood. The new CSSC will include opportunities for dining, events, Career placement, Veterans Affairs, Intercultural and Student Affairs, and a radio station.

12.2 Comprehensive Plan Policy Guides

The City of Portland Comprehensive Plan includes eight specific policy guides focused on the topics of environment, historic resources, waterfront, economy, housing, recreation and open space, facilities and services and transportation. The discussion below emphasizes how the proposed development is consistent with the following applicable policies of environment; economy; housing; recreation and open space; facilities and services; and transportation.

Environment Policy Guide

- Within the Environment Policy Guide, one of the local goals is to develop climate resilience through specific carbon reduction goals, comprehensive climate adaptation strategies, and protections for the City's most vulnerable infrastructure. The design team has specifically considered resiliency as part of the proposed development through building design and site layout.

- Develop climate resilience through specific carbon reduction goals, comprehensive climate adaptation strategies, and protections for the city's most vulnerable infrastructure. The University has a number of

sustainability initiatives, including Alternative Transportation; Sustainable Landscapes; Water, Stormwater, and Pollution; and Dining Services. The University signed the President's Carbon Commitment in 2007 which commits the University to achieving carbon neutrality by year 2040.

- The Policy Guide also has a local goal to adopt sustainable land use and transportation policies that support connectivity, walkable neighborhoods, and multi-modal transportation. The proposed project continues to emphasize the Facilities Master Plan's ideas of connectivity and walkability. The project will prioritize pedestrian movements through the site, and to throughout the campus.

- The University has a Strategic Sustainability Plan, developed in 2017 that was endorsed by Student Senate and the Master Planning Committee. The Plan has the goal of carbon neutrality by 2040 as its overarching focus. And, there are three pillars in the plan: Energy, Material Resources, and Education & Outreach. Collectively, the three pillars encompass over 120 specific initiatives. Progress on the plan is reported every two years, and the University just published its progress report

- One future strategy is improving water quality. As described by the Stormwater Management Plan attached to this application, stormwater best management practices will be incorporated into the Site to provide water quality treatment. The project also incorporates several Low Impact Development (LID) water quality facilities.

The Career and Student Success Center and Residence Hall project aligns with the many of the goals of the City's environmental policy.

Economy Policy Guide

The proposed development directly supports the goals and future strategies within the Economy Policy Guide including:

- Support sustainable growth in our educational, medical and cultural institutions

- Invest, attract and retain human capital to support a growing economy.

- Support job creation and business growth through public initiatives and private, institutional and regional partnerships.

- Prepare our current and future residents to compete in an increasingly knowledge-based economy

- Invest in educational institutions and training as a means of attracting, developing, and retaining an educated workforce.

- Promote the orderly expansion of institutional uses, such as educational, cultural, and hospital campuses, which are central to workforce development, employment, and the health of the local and regional economies.

- Ensure that the growth of Portland's educational, medical, and cultural institutions is integrated into Portland's urban fabric through the use of high-quality design, management of impacts, community partnerships, and innovative planning.

- Sustain and strengthen relationships between local organizations and our anchor institutions to capitalize on their unique value to the well-being and future success of Portland and the region.

Established in 1968, the University of Maine System is the state's largest educational enterprise. It has an annual enrollment of nearly 30,000 students and positively impacts the lives of hundreds of thousands of Mainers each year through its educational and cultural offerings as well as outreach and public service to individuals, businesses,

organizations and policymakers. The System has an estimated $1.5 billion total statewide economy impact each year, a return of $7.50 for every dollar of State appropriation. Two-thirds of its alumni—approximately 120,000 people—live in Maine.

The University of Southern Maine, northern New England's outstanding public, regional, comprehensive university, is dedicated to providing students with a high-quality, accessible, affordable education. Through its undergraduate, graduate, and professional programs, USM faculty members educate future leaders in the liberal arts and sciences, engineering and technology, health and social services, education, business, law, and public service. Distinguished for their teaching, research, scholarly publication, and creative activity, the faculty are committed to fostering a spirit of critical inquiry and civic participation. USM embraces academic freedom for students, faculty, and staff, and advocates diversity in all aspects of its campus life and academic work. It supports sustainable development, environmental stewardship, and community involvement. As a center for discovery, scholarship, and creativity, USM provides resources for the state, the nation, and the world.

Housing Policy Guide

The proposed project includes student housing and supports the goals of the City's Housing Policy Guide, including:

- Increase, preserve, and modify the overall supply of housing city-wide to meet the needs, preferences and financial capabilities of all Portland residents.

- Encourage quality, sustainable design in new housing development.

The University is committed to creating a safe, high quality and affordable student life environment that supports the overall well-being of its diverse community. It seeks to create a residential community for upper-division (third- and fourth-year) undergraduate, graduate, and law students that is proximate to academic resources and support. It is important to the University that the housing development maintains housing affordability for students while assuring financial and environmental sustainability.

Recreation and Open Space Policy Guide

The proposed project will create new open spaces on the campus, which align with several of the goals of the City Recreation and Open Space Policy Guide, including:

- Sustain and build our system of parks, trails, and open spaces to enhance our quality of life, protect our environment, and promote the economic well-being of our remarkable city by the sea.

- Provide high-quality, well-designed, well-maintained, safe, and integrated parks, trails, public open spaces, and recreational opportunities accessible to all residents.

The transformation of the Woodbury Campus Center parking lot into the proposed Campus Quad will create new outdoor space to accommodate a variety of programs, from special events like graduation, to a place to congregate, relax, or study between classes.

Facilities and Services Policy Guide

While the Portland Facilities and Services Policy Guide focuses on City provided infrastructure and public school, this project echoes several of the goals and future strategies in the Guide:

- Maintain and support a quality educational system that is responsive to the educational needs of our community.

- Make strategic investments in school facilities to modernize and update buildings and grounds, ensure student safety, and preserve and enhance neighborhood connections.
- Leverage State, local, and private funding to allow a comprehensive approach to sustain excellence in the school system.
- Continue to provide continuing education and job training for adults and new residents.
- Pursue public/private partnerships to fund needed projects and services.

Transportation Policy Guide

The proposed project will build on the University's commitment to efficient use of public facilities and services to accommodate anticipated growth and development. It aligns with the following Goals and Future Strategies contained in the Transportation Policy Guide:

- Promote multi-modal accessibility, enabling residents and visitors of all ages and abilities to participate fully in the social and economic life of the community.
- Support livability by improving the quality of life in neighborhoods and improving the public health of residents.
- Support sustainability by reducing energy consumption, greenhouse gas emissions, and stormwater impacts.
- Identify, plan, and zone for parking needs, particularly downtown, on the waterfront, and in conjunction with large institutions.
- Develop robust, integrated parking management strategies to reduce parking demand.
- Invest in a walkable city through sidewalk maintenance, accessibility improvements, trail and path connections, snow clearance, lighting, landscaping, traffic calming, enhanced street crossings, strong urban design, artistic elements, and wayfinding.
- Expand Transportation Demand Management (TDM) initiatives for large development sites and institutions, building upon the recent implementation of TDM plans for individual employers and sites.

The project supports pedestrian, bicycle, shuttle bus, and the metro public transit systems, that looks beyond the private vehicle parking needs of the campus community. The University has developed a draft TDM, which is attached.

14. BOUNDARY SURVEY

A boundary and topographic survey of the Site was completed by SurveyWorks, Inc. Professional Land Surveyors. The survey was completed in February of 2020. The survey is included with the project drawings.

14.1 Attachments

- Boundary & Topographic Survey, prepared by SurveyWorks, Inc. (uploaded to Drawings folder in Eplan)

15. AVAILABILITY & ADEQUACY OF PUBLIC UTILITIES

The proposed project will be serviced by public water, sewer, gas, and electric utilities. The proposed locations of the utility services are shown on the Utility Plan included in the Design Drawings attached to Section 3. The proposed development will also generate waste as a result of construction and post-construction operations.

15.1 Water

The water services for the proposed development will be provided as shown on the drawings via connections to the public water main on Durham Street. Separate domestic and fire protection services will be provided to both the CSSC and Residence Hall. Existing services to the demolished buildings identified as #25 and #35 Bedford Street will be abandoned. Preliminary calculations indicate that available flow and pressure is adequate for fire service such that a separate fire pump is not necessary. SMRT has been working directly with the Portland Water District (PWD) to determine the appropriate design for this work. Based on the results of these meetings, we are in the process of designing the water system services, and we will be scheduling a meeting with PWD to review our system design. An ability to serve determination will be provided upon receipt.

15.2 Sewer

The proposed development will be provided with sanitary sewer services as shown on the drawings. The services from the proposed buildings will be gravity sewer that will discharge to the public sanitary sewer on Durham Street. Existing services to the demolished buildings identified as #25 and #35 Bedford Street will be abandoned. The CSSC includes dining and commercial kitchen uses and an external grease trap will be provided as shown on the drawings. The attached letter is provided to request confirmation of ability to serve the proposed development; the Wastewater Capacity Application was submitted with this letter. A copy of the City's determination will be provided upon receipt.

15.3 Gas

The proposed development will utilize natural gas service provided by Unitil. New services for both buildings will be brought from an existing gas main in Durham Street as shown on the Utility Plan. The location and size of the gas service is being coordinated with Unitil. We have met with Unitil to review the project needs. With final meter locations selected, the utility plan will be provided to Unitil for their review. An ability to serve determination will be provided upon receipt.

15.4 Electric

The proposed development will utilize underground electric service through connection to the existing campus infrastructure. Proposed electric services will extend from the existing transformer near the Central Heating building to two adjacent transformers. Proposed infrastructure is shown on the Utility Plan. The design of the electric service is being coordinated with Central Maine Power (CMP). We met with CMP to review the proposed work. We also met with CMP and the City of Portland Department of Public Works to discuss possible opportunities to collaborate with the City on utility infrastructure. Final electric layouts will be provided to CMP for their review and an ability to serve determination will be provided upon receipt.

15.5 Solid Waste

Adequate provisions for recycling and solid waste disposal have been made. The campus presently collects solid waste at two compactors adjacent to #25 Durham Street where dumpsters are managed by a commercial waste hauler. This management will continue with the compactors being relocated to the CSSC loading dock. All solid waste materials and recyclables generated by the proposed project will be transported and disposed of or recycled in accordance with applicable laws and regulations. Solid waste will be managed in full accordance with all applicable laws and regulations.

In addition, the University will maintain their composting program related to the dining facilities, to be relocated to the CSSC, which is managed through a third-party contractor.

During Construction of this project, the recycling and solid waste dumpsters currently located behind the facilities building will be temporarily located to the north of the Sullivan Gym. The temporary location will be accessed from Durham Street as shown on the logistics plan included in Section 13. The area will be prepared with a gravel or paved surface, and privacy fence. Upon completion of the project and location of the permanent solid waste area to the north of the new CSSC, the temporary location at the corner of Durham and Falmouth Streets will be returned to its current landscaped condition.

15.6 Construction & Demolition Debris

The proposed development will generate construction waste and demolition debris (CDD). The Contractor will be responsible for properly disposing of the CDD. The Contractor will be responsible for handling, managing, and disposing of all waste generated by construction in accordance with the Maine Solid Waste Management Regulations and all other applicable local, state, and federal regulations.

15.7 Special & Hazardous Waste

The proposed development is not anticipated to produce any hazardous waste. Environmental assessments of the Site and existing buildings are in the process of being conducted and the University, the Developer, and the Contractor will adhere to all Federal, State, and Local regulations concerning the handling and disposal of special or hazardous wastes.

15.8 Attachments

- Portland Department of Public Works Request for Ability to Serve Letter and Wastewater Capacity Application
- Portland Water District Ability to Serve Letter

March 5, 2020
Job No.: 19206

Brad Roland, Senior Engineer
City of Portland Public Works – Water Resources Group
212 Canco Road Suite B
Portland, ME 04103

RE: Request for Ability to Serve
Proposed Career and Student Success Center & Residence Hall, University of Southern Maine

Dear Mr. Roland,

On behalf of Capstone Development, SMRT Architects & Engineers is submitting this request for Ability to Serve letter for a new project on the campus of the Univesrity of Southern Maine in Portland. The Ability to Serve letter is intended for Level III Site Plan application to the City of Portland.

Project Location

The University of Southern Maine (USM) is proposing to construct two new capital buildings on approximately 3.6 acres of the Portland campus of the University of Southern Maine. The project is known as the Career and Student Success Center (CSSC) & Residence Hall project. The project area is bounded by the easterly corner of the block defined by Falmouth, Durham, and Bedford Streets. This area presently includes a large public parking lot, the Woodbury Student Center (approx. 21,701 sf), the Facilities Management building (8,950 sf), and associated service areas, parking, and infrastructure. This project will remove all features in the project area and essential services, infrastructure, and offices will be relocated on campus prior to commencing demolition. Please see attached CD101, Existing Conditions and Demolition Plan for project location details.

Project Scope

The project consists of the construction of two primary buildings to replace two existing buildings on the campus. The Woodbury Center (#35 Bedford) and the Facilities Management building (#25 Bedford) will be demolished and the existing water services associated with these structures will be abandoned. A new residence hall will be constructed at the corner of Bedford Street and Durham Street including with five to eight stories and a footprint of approximately 31,200 s.f.footprint with a total gross floor space of approximately 220,000 sf. This building represents the first residence hall on the Portland campus and will house approximatey 580 students in units varying in occupancy from 1 to 3 residents. The second building will replace the funciton of the Woodbury Center and is titled the Career and Student Success Center (CSSC). This building will be located between Masterton and Sullivan Halls and adjacent to the westerly edge of the new residence hall. The CSSC will be a three story building with a footprint of approximately 30,000 s.f. with a total gross footprint of approximately 60,000 sf. The CSSC uses will include mass gathering spaces, the campus bookstore, a dining facility, and other student uses. Both buildings will have full sprinkler systems per code.

Existing Sewer Infrastructure

The site is bounded on two sides by Durham Street and Bedford Street. There is an existing 8" sewer main in Durham Street and an existing sewer main in Bedford Street that ranges up to 24" diameter. See CD101, Existing Conditions and Demolition Plan.

Proposed Services

It is proposed to establish new services for both buildings and preliminary design identifies that service from the existing 8" main in Durham Street is most feasible. The enclosed Utility Plan (CU101) shows a proposed service for the residence hall extending to a new sanitary manhole near the intersection of Bedford and Durham Streets. A proposed service for the CSSC will extend thru the service area to a new sanitary manhole near its entrance onto Durham Street. It is anticipated that there are no easements necessary for these services and this development will fully build-out this portion of campus.

Proposed Flows

The anticipated domestic water demand for the CSSC is estimated at 22,500 gpd based upon the mixture of uses. A peak flow of 120 gpm is estimated based on the number of fixtures. An external grease interceptor will be provided for the flows from the dining facility and the volume for this structure is estimated at 3,400 gallons. Please see attached Peak Flow Based On Fixture Count spreadsheet. (PWD)

The anticipated domestic water demand for the Residence Hall is estimated at 3590 gpd based upon approximately 580 student residents. A peak flow of 380 gpm is estimated based on the number of fixtures. Please see attached Peak Flow Based On Fixture Count spreadsheet. (PWD)

Preliminary Drawings

Please find attached the following Preliminary Drawings, dated March 6, 2020:

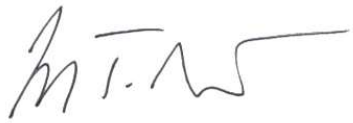
- CD101, Existing Conditions and Demolition Plan
- CU101, Site Utility Plan
- CU501, Utility Details

City of Portland Permitting

It is intented that this project was submitted to the City of Portland on March 6, 2020 under a Level III Site Plan application and Site Location of Development Act delegated review.

Please call with any questions or if you need additional information. Thank you for your assistance with this matter.

Sincerely,



Jeffrey T. Aceto, P.E.
Senior Civil Engineer

SMRT Architects and Engineers | 144 Fore Street | Portland, ME 04101
p 207.321.3829 | c 207.650.5674 | email: jaceto@smrtinc.com

CC:

Peak Flow Based on Fixture Count

Adapted from 2009 Maine State Internal Plumbing Code

Customer	USM SSC
Street Address	
City	Portland Maine

Fixture		Fixture Value 60 psi		No. of Fixtures		Fixture Value
Bathtub		4	x	0	=	0
Bidet		1	x	0	=	0
Dental Unit		1	x	0	=	0
Drinking Fountain - Public		0.5	x	3	=	1.5
Kitchen Sink		1.5	x	1	=	1.5
Bathroom Sink		1	x	12	=	12
Showerhead (Shower Only)		2	x	0	=	0
Service Sink		3	x	3	=	9
Toilet	-Flushometer(high pressure)	5	x	24	=	120
	-Tank Type	2.5	x	0	=	0
Urinal	-Flushometer Valve	5	x	6	=	30
	-Tank Type	2	x	0	=	0
Wash Sink (Each Set of Faucets)		2	x	0	=	0
Commercial Kitchen with Dishwasher		37	x	1	=	37
Washing Machine		4	x	0	=	0
Hose (outdoor spigot)	<3/4 in.	2.5	x	4	=	10
Combined Fixture Value Total						221

Customer Peak Demand From Fig. 4-2 or 4-3	
Pressure Factor From Table 4-1	
Fire Sprinkler System(Yes/No)?	Yes
Irrigation(Yes/No)?	Yes
If yes, gpm required by irrigation designer:	

Total Fixed Demand (Peak Flow) **0**

Customer only needs to complete the cells highlighted in blue

Peak Flow Based on Fixture Count

Adapted from 2009 Maine State Internal Plumbing Code

Customer	University of Southern Maine
Street Address	Corner of Bedford St and Durham St Portland, ME
City	Portland ME

Fixture		**Fixture Value 60 psi**		**No. of Fixtures**		**Fixture Value**
Bathtub		4	x	0	=	0
Bidet		1	x	0	=	0
Dental Unit		1	x	0	=	0
Drinking Fountain - Public		0.5	x	0	=	0
Kitchen Sink		1.5	x	162	=	243
Bathroom Sink		1	x	432	=	432
Showerhead (Shower Only)		2	x	432	=	864
Service Sink		3	x	8	=	24
Toilet -Flushometer(high pressure)		5	x	0	=	0
-Tank Type		2.5	x	432	=	1080
Urinal -Flushometer Valve		5	x	0	=	0
-Tank Type		2	x	0	=	0
Wash Sink (Each Set of Faucets)		2	x	0	=	0
Dishwasher		1.5	x	162	=	243
Washing Machine		4	x	176	=	704
Hose (outdoor spigot)	<3/4 in.	2.5	x	0	=	0
Combined Fixture Value Total						3590

Customer Peak Demand From Fig. 4-2 or 4-3	
Pressure Factor From Table 4-1	

Fire Sprinkler System(Yes/No)?	Yes
Irrigation(Yes/No)?	No
If yes, gpm required by irrigation designer:	-

Total Fixed Demand (Peak Flow) **380**

Customer only needs to complete the cells highlighted in blue

March 5, 2020
Job No.: 19206

Heather Smith
MEANS Group
Main Extensions and New Services
Portland Water District
225 Douglass Street
Portland, ME 04104-3553

RE: Request for Ability to Serve
Proposed Career and Student Success Center & Residence Hall, University of Southern Maine

Dear Ms. Smith,

On behalf of Capstone Development, SMRT Architects & Engineers is submitting this request for Ability to Serve letter for a new project on the campus of the Univesrity of Southern Maine in Portland. The Ability to Serve letter is intended for Level III Site Plan application to the City of Portland.

Project Location

The University of Southern Maine (USM) is proposing to construct two new capital buildings on approximately 3.6 acres of the Portland campus of the University of Southern Maine. The project is known as the Career and Student Success Center (CSSC) & Residence Hall project. The project area is bounded by the easterly corner of the block defined by Falmouth, Durham, and Bedford Streets. This area presently includes a large public parking lot, the Woodbury Student Center (approx. 21,701 sf), the Facilities Management building (8,950 sf), and associated service areas, parking, and infrastructure. This project will remove all features in the project area and essential services, infrastructure, and offices will be relocated on campus prior to commencing demolition. Please see attached CD101, Existing Conditions and Demolition Plan for project location details.

Project Scope

The project consists of the construction of two primary buildings to replace two existing buildings on the campus. The Woodbury Center (#35 Bedford) and the Facilities Management building (#25 Bedford) will be demolished and the existing water services associated with these structures will be abandoned. A new residence hall will be constructed at the corner of Bedford Street and Durham Street including with five to eight stories and a footprint of approximately 31,200 s.f.footprint with a total gross floor space of approximately 220,000 sf. This building represents the first residence hall on the Portland campus and will house approximatey 580 students in units varying in occupancy from 1 to 3 residents. The second building will replace the funciton of the Woodbury Center and is titled the Career and Student Success Center (CSSC). This building will be located between Masterton and Sullivan Halls and adjacent to the westerly edge of the new residence hall. The CSSC will be a three story building with a footprint of approximately 30,000 s.f. with a total gross footprint of approximately 60,000 sf. The CSSC uses will

include mass gathering spaces, the campus bookstore, a dining facility, and other student uses. Both buildings will have full sprinkler systems per code.

Existing Water Infrastructure

The site is bounded on two sides by Durham Street and Bedford Street. There is an existing 8" main in Durham Street including an existing hydrant between Sullivan Hall and the Central Heating building. See CD101, Existing Conditions and Demolition Plan. There is an existing 16" main in Bedford Street including an existing hydrant near the Glickman Family Library and another adjacent to the Wishcamper Center. There are also three hydrants along Falmouth Street in the vicinity of the campus parcel.

Proposed Services

It is proposed to establish new services for both buildings and preliminary design identifies that service from the existing 8" main in Durham Street is most feasible. The enclosed Utility Plan (CU101) shows proposed separate fire and domestic services for the residence hall extending from the main to a mechanical room along the northerly façade. It also shows proposed fire and domestic services for the CSSC extending from Durham Street in the loading dock area. Isolation valves will be installed at the property line for all services. The existing hydrant on Durham will remain and is apparently well-located to serve the two new buildings. It is anticipated that there are no easements necessary for these services and this development will fully build-out this portion of campus.

Proposed Flows

The anticipated domestic water demand for the CSSC is estimated at 22,500 gpd based upon the mixture of uses. A peak flow of 120 gpm is estimated based on the number of fixtures. An external grease interceptor will be provided for the flows from the dining facility and the volume for this structure is estimated at 3,400 gallons. Please see attached Peak Flow Based On Fixture Count spreadsheet. (PWD)

The anticipated domestic water demand for the Residence Hall is estimated at 3590 gpd based upon approximately 580 student residents. A peak flow of 380 gpm is estimated based on the number of fixtures. Please see attached Peak Flow Based On Fixture Count spreadsheet. (PWD)

Preliminary Drawings

Please find attached the following Preliminary Drawings, dated March 6, 2020:

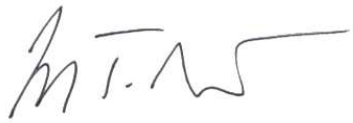
- CD101, Existing Conditions and Demolition Plan
- CU101, Site Utility Plan
- CU501, Utility Details

City of Portland Permitting

It is intented that this project was submitted to the City of Portland on March 6, 2020 under a Level III Site Plan application and Site Location of Development Act delegated review.

Please call with any questions or if you need additional information. Thank you for your assistance with this matter.

Sincerely,



Jeffrey T. Aceto, P.E.
Senior Civil Engineer

SMRT Architects and Engineers | 144 Fore Street | Portland, ME 04101
p 207.321.3829 | c 207.650.5674 | email: jaceto@smrtinc.com

CC:

Peak Flow Based on Fixture Count

Adapted from 2009 Maine State Internal Plumbing Code

Customer	University of Southern Maine
Street Address	Corner of Bedford St and Durham St Portland, ME
City	Portland ME

Fixture		**Fixture Value 60 psi**		**No. of Fixtures**		**Fixture Value**
Bathtub		4	x	0	=	0
Bidet		1	x	0	=	0
Dental Unit		1	x	0	=	0
Drinking Fountain - Public		0.5	x	0	=	0
Kitchen Sink		1.5	x	162	=	243
Bathroom Sink		1	x	432	=	432
Showerhead (Shower Only)		2	x	432	=	864
Service Sink		3	x	8	=	24
Toilet -Flushometer(high pressure)		5	x	0	=	0
-Tank Type		2.5	x	432	=	1080
Urinal -Flushometer Valve		5	x	0	=	0
-Tank Type		2	x	0	=	0
Wash Sink (Each Set of Faucets)		2	x	0	=	0
Dishwasher		1.5	x	162	=	243
Washing Machine		4	x	176	=	704
Hose (outdoor spigot)	<3/4 in.	2.5	x	0	=	0
Combined Fixture Value Total						3590

Customer Peak Demand From Fig. 4-2 or 4-3	
Pressure Factor From Table 4-1	

Fire Sprinkler System(Yes/No)?	Yes
Irrigation(Yes/No)?	No
If yes, gpm required by irrigation designer:	-

Total Fixed Demand (Peak Flow) **380**

Customer only needs to complete the cells highlighted in blue

Peak Flow Based on Fixture Count

Adapted from 2009 Maine State Internal Plumbing Code

Customer	USM SSC
Street Address	
City	Portland Maine

Fixture		**Fixture Value 60 psi**		**No. of Fixtures**		**Fixture Value**
Bathtub		4	x	0	=	0
Bidet		1	x	0	=	0
Dental Unit		1	x	0	=	0
Drinking Fountain - Public		0.5	x	3	=	1.5
Kitchen Sink		1.5	x	1	=	1.5
Bathroom Sink		1	x	12	=	12
Showerhead (Shower Only)		2	x	0	=	0
Service Sink		3	x	3	=	9
Toilet -Flushometer(high pressure)		5	x	24	=	120
-Tank Type		2.5	x	0	=	0
Urinal -Flushometer Valve		5	x	6	=	30
-Tank Type		2	x	0	=	0
Wash Sink (Each Set of Faucets)		2	x	0	=	0
Commercial Kitchen with Dishwasher		37	x	1	=	37
Washing Machine		4	x	0	=	0
Hose (outdoor spigot)	<3/4 in.	2.5	x	4	=	10
Combined Fixture Value Total						221

Customer Peak Demand From Fig. 4-2 or 4-3	
Pressure Factor From Table 4-1	

Fire Sprinkler System(Yes/No)?	Yes
Irrigation(Yes/No)?	Yes
If yes, gpm required by irrigation designer:	

Total Fixed Demand (Peak Flow) **0**

Customer only needs to complete the cells highlighted in blue

Peak Flow Based on Fixture Count

Adapted from 2009 Maine State Internal Plumbing Code

Customer	USM SSC
Street Address	
City	Portland Maine

Fixture		**Fixture Value 60 psi**		**No. of Fixtures**		**Fixture Value**
Bathtub		4	x	0	=	0
Bidet		1	x	0	=	0
Dental Unit		1	x	0	=	0
Drinking Fountain - Public		0.5	x	3	=	1.5
Kitchen Sink		1.5	x	1	=	1.5
Bathroom Sink		1	x	12	=	12
Showerhead (Shower Only)		2	x	0	=	0
Service Sink		3	x	3	=	9
Toilet -Flushometer(high pressure)		5	x	24	=	120
-Tank Type		2.5	x	0	=	0
Urinal -Flushometer Valve		5	x	6	=	30
-Tank Type		2	x	0	=	0
Wash Sink (Each Set of Faucets)		2	x	0	=	0
Commercial Kitchen with Dishwasher		37	x	1	=	37
Washing Machine		4	x	0	=	0
Hose (outdoor spigot)	<3/4 in.	2.5	x	4	=	10

Combined Fixture Value Total: 221

Customer Peak Demand From Fig. 4-2 or 4-3:

Pressure Factor From Table 4-1:

Fire Sprinkler System(Yes/No)? Yes

Irrigation(Yes/No)? Yes

If yes, gpm required by irrigation designer:

Total Fixed Demand (Peak Flow) **0**

Customer only needs to complete the cells highlighted in blue

Peak Flow Based on Fixture Count

Adapted from 2009 Maine State Internal Plumbing Code

Customer	University of Southern Maine
Street Address	Corner of Bedford St and Durham St Portland, ME
City	Portland ME

Fixture		**Fixture Value 60 psi**		**No. of Fixtures**		**Fixture Value**
Bathtub		4	x	0	=	0
Bidet		1	x	0	=	0
Dental Unit		1	x	0	=	0
Drinking Fountain - Public		0.5	x	0	=	0
Kitchen Sink		1.5	x	162	=	243
Bathroom Sink		1	x	432	=	432
Showerhead (Shower Only)		2	x	432	=	864
Service Sink		3	x	8	=	24
Toilet -Flushometer(high pressure)		5	x	0	=	0
-Tank Type		2.5	x	432	=	1080
Urinal -Flushometer Valve		5	x	0	=	0
-Tank Type		2	x	0	=	0
Wash Sink (Each Set of Faucets)		2	x	0	=	0
Dishwasher		1.5	x	162	=	243
Washing Machine		4	x	176	=	704
Hose (outdoor spigot)	<3/4 in.	2.5	x	0	=	0
Combined Fixture Value Total						3590

Customer Peak Demand From Fig. 4-2 or 4-3	
Pressure Factor From Table 4-1	

Fire Sprinkler System(Yes/No)?	Yes
Irrigation(Yes/No)?	No
If yes, gpm required by irrigation designer:	-

Total Fixed Demand (Peak Flow) **380**

Customer only needs to complete the cells highlighted in blue

16. PORTLAND FIRE DEPARTMENT SITE REVIEW CHECKLIST

The items in the Portland Fire Department Site Review Checklist are addressed as follows:

- Name, address, telephone number of applicant:
    - University of Southern Maine, c/o John Souther
    - 25 Bedford Street, Portland, ME 04104
    - (207) 780-4585
- Name, address, telephone number of architects:
    - SMRT, c/o Kristen Damuth, AIA, NCARB
        - 144 Fore Street, PO Box 618 Portland, ME 04104
        - 207.321.3847
- Proposed uses of any structures [NFPA and IBC classification]:
    - The structures are mixed-use and residential. Use classifications are provided on the code summaries attached.
- Square footage of all structures [total and per story]:
    - The square footage of all structures is provided on the architectural plans.
- Elevations of all structures:
    - The elevations of all structures are provided on the architectural plans.
- Proposed fire protection of all structures:
    - All structures will be sprinkled.
- Hydrant locations:
    - Hydrant locations are shown on the Utility Plan.
- Water main size and location:
    - Watermain locations and sizes are shown on the Utility Plan.
- Access to all structures [min. 2 sides]:
    - Access will be provided to a minimum of two sides of all structures.
- A code summary shall be included referencing NFPA 1 and all fire department technical standards:
    - The buildings will be compliant with requirements of NFPA 101: Uniform Fire Code. Automatic sprinkler systems and fire alarms will be provided as required by Use and Occupancy types. Code summaries are provided on the attached Code Reviews.

16.1 Attachments

- USM Career and Student Success Center Code Review
- USM Residence Hall Code Review

USM Residence Hall

Code CheckIist - Things you can know on Day One

References Based on IBC State Code 2015, unless noted otherwise.

Item	Code Reference	Calculation, or input	Notes		
Building Codes					
MUBEC	Current				
IBC - per MUBEC	2015	except chap 29 and appendices a-m, plus 7 pages of amendments			
IECC	2009	chap 6 updates			
NFPA 101	2018				
NFPA 1	2018				
ADA	2010				
NEC	2017				
IMC	2015				
ASHRAE 90.1	2013				
UPC	2015				
ZONING					
Check Zoning Requirements	Varies				
OCCUPANCY		calcs			
Occupancy classification	(302.1)	**R-2**			
Occupancy Description		*Residential Dormitory*			
Proposed Construction type	(602.1)	**TYPE IB**			
Sprinkler req'd	(903.2)	yes NFPA 13	not 13R it's too big.		
Stories Permited	(504.4)	12	R2-S		
Story Increase	(504.4)	n/a			
Max. Stories Permited		**12**			
Actual max. stories					
Max. height in Ft.		**180**	Building is NOT a high rise. Since highest occupiable floor is <75' from lowest level of fire apparatus		
Max. allowable area (SF)	Table 506.2	**UL**	R2-SM		
Sprinkler increase	(506.2)	n/a			
Frontage increase	(506.3)	n/a			
Total Allowable Area		**UL**			
Actual Overall Area		**215,000**			
Actual floor area 1-5		**31,797**	level 2		
Actual floor area 6-8		**18,722**	level 8		
# of Occupants		**4300**	50		GSF
Fire Apparatus Access	(F503.1) Fire Code				
Accessibility	(1101) and ANSI A117.1	yes			
Area of Refuge	(1009.3, & 1009.6)	not required	1009.3(5) exception for sprinklers		
CONSTRUCTION TYPE					
Proposed Construction type	Table 601	**TYPE IB**			
Bldg Element	-	Fire rating (hrs)'			
Structural frame, incl. columns, girders, trusses.	-	2a			a: fire rating of primary structural frame and bearing walls allowed to be reduced to 1 hour if supporting roof only
Bearing walls (exterior)	-	2			
Bearing walls (interior)	-	2a			
Non-bearing walls	-				
Exterior	-	See Table 602			
interior	-	0			
Floor construction, incl. supporting beams & joists	-	2			
Roof construction, incl. supporting beams & joists	-	1b,c			b: does not apply

Exterior Wall - fire separation distance		1 hr if < 30'			
Shafts	(713.4)	2 hour			
Firewalls (if req'd)	(706.4)	3			
Fire partitions	(420, 708)	1 hour	separation between sleeping rooms		
		30 min	at corridors		
Occupancy Separation (if req'd)	Table 508.4	1 hour	R2 to A or B		
Incidental Separation (if req'd)	Table 509				
EGRESS					NFPA 101
Stair Width	1005.3.1, & 1009.3	63"	.3"/pp		31,797 / 50 = 636 people. 636/ 3 stairs = 212 people/stair. 212 *.3= 63"
# of exits req'd	Table 1006.3.1	2 on 6-8, 3 on 1-5			
Common Path of Travel	Table (1006.2.1)	125'			
Accessible means of Egress	(1009.1)	yes	elevator per 1009.2.1 unless we add a horiz exit		
Area of Refuge		no	1009.3.5 & 8 not in R-2 or stairs when building sprinkled		
Max. travel distance	Table 1017.2	250'			
Corridor rating	Table (1020.1)	30 min			
Corridor width		44 min.	.2"/pp		
Dead End	(1020.4)	50'			
Exit Enclosure rating	Table 1023.2				
Ambulance Elevator Cab	3002.4	yes			
Fire extinguishers	F906.1 Fire Code				

USM Student Success Center (SSC)

Code Checklist - Things you can know on Day One

References Based on IBC State Code 2015, unless noted otherwise.

Item	Code Reference	Calculation, or input	Calculation, or input	Calculation, or input	Notes
Building Codes					
MUBEC	Current				
IBC - per MUBEC	2015	except chap 29 and appendices a-m, plus 7 pages of amendments	except chap 29 and appendices a-m, plus 7 pages of amendments	except chap 29 and appendices a-m, plus 7 pages of amendments	
IECC	2009	chap 6 updates	chap 6 updates	chap 6 updates	
NFPA 101	2018				
NFPA 1	2018				
ADA	2010				
NEC	2017				
IMC	2015				
ASHRAE 90.1	2013				
UPC	2015				
ZONING					
Check Zoning Requirements	Varies				
OCCUPANCY		calcs	calcs	calcs	
Occupancy classification	(302.1)	**B**	**A-2**	**A-3**	
Occupancy Description		*Business*	*Food related assembly*	*Misc Assembly*	
		level 2 & 3	*kitchen, servery dining*	*Multipurpose room*	
			level 1	*corner of level 2*	
Proposed Construction type	(602.1)	**TYPE IV-HT**	**TYPE IV-HT**	**TYPE IV-HT**	
Sprinkler req'd	(903.2)	no but provided	yes	yes not on level of exit discharge	
Stories Permited	(504.4)	6	4	4	
Story Increase	(504.4)	not needed	not needed	not needed	
Max. Stories Permited					
Actual max. stories					
Stories provided		**3 plus a penthouse**	**3 plus a penthouse**	**3 plus a penthouse**	penthouse must be less than 1/3 area of floor below and <18' high
Max. height in Ft.		**85'**	**85'**	**75'**	
Provided height in Ft.		**50' + 12' PH**	**50' + 12' PH**	**50' + 12' PH**	
Max. allowable area (SF)	Table 506.2	**108,000**	**45,000**	**28,500**	SM (sprinkled)
Sprinkler increase	(506.2)	n/a	n/a	n/a	
Frontage increase	(506.3)	n/a	n/a	n/a	
Total Allowable Area		**108,000**	**45,000**	**28,500**	
Actual FLOOR Area		**23518, 19209, 12798**	**22,468**	**4,000**	
# of Occupants		**192 level 2**	**1498 level 1 (15 sf pp)**	**266 (15 sf pp)**	200 gsf
Fire Apparatus Access	(F503.1) Fire Code				
Accessibility	(1101) and ANSI A117.1	yes	yes	yes	
Area of Refuge	(1009.3, & 1009.6)	not required	not required	not required	1009.3(5) exception for sprinklers
CONSTRUCTION TYPE					
Proposed Construction type	Table 601	**TYPE IV-HT**	**TYPE IV-HT**	**TYPE IV-HT**	
Bldg Element	-	Fire rating (hrs)'	Fire rating (hrs)'	Fire rating (hrs)'	
Structural frame, incl. columns, girders, trusses.	-	**0**	**0**	**0**	
Bearing walls (exterior)	-	**0**	**0**	**0**	
Bearing walls (interior)	-	**0**	**0**	**0**	
Non-bearing walls	-				
Exterior	-	**See Table 602**	**See Table 602**	**See Table 602**	
interior	-	**0**	**0**	**0**	
Floor construction, incl. supporting beams & joists	-	**0**	**0**	**0**	
Roof construction, incl. supporting beams & joists	-	**0c**	**0c**	**0c**	
Exterior Wall - fire separation distance		**0 if between 10'-30'**	**0 if between 10'-30'**	**0 if between 10'-30'**	
Shafts	(713.4)	**1 hour**	**1 hour**	**1 hour**	if connecting less than 4 stories
Firewalls (if req'd)	(706.4)	**2**	**2**	**2**	
Fire partitions	(708)	**n/a**	**n/a**	**n/a**	
Occupancy Separation (if req'd)	Table 508.4	**1 hour**	**1 hour**	**1 hour**	Assembly to Business
Incidental Separation (if req'd)	Table 509	**n/a**	**n/a**	**n/a**	
EGRESS					
Stair Width	1005.3.1, & 1009.3	**57"**	**n/a**		.3"/pp
# of exits req'd	Table 1006.3.1	**2**	**4**	**4 (if standing only)**	
Common Path of Travel	Table (1006.2.1)	**100**	**75'**	**75'**	
Accessible means of Egress	(1009.1)				
Max. travel distance	Table 1017.2	**300'**	**250'**	**250'**	
Corridor rating	Table (1020.1)	**0**	**0**	**0**	
Corridor width		**44" min**	**44" min**	**44" min**	
Dead End	(1020.4)	**50'**	**20'**	**20'**	
Exit Enclosure rating	Table 1023.2				
Ambulance Elevator Cab	3002.4	no	no	no	
Fire extinguishers	F906.1 Fire Code				

University of Southern Maine

Residence Hall and Career Student Success Center

Design Narrative

Capstone Development Partners
SMRT Architects and Engineers
Elkus Manfredi Architects

4 June 2020

The University of Southern Maine is a fast growing and increasingly influential educational institution in the City of Portland, as well as the state of Maine. The 2019 Facilities Master Plan outlined a series of important planning and building initiatives to better prepare the university to attract and retain highly qualified students and faculty thereby transforming the local and state economies through scholarship, civic and cultural engagement, and innovation. The addition of 580 new residential beds and a student center focused on career counseling and graduate success, both framing a new central quad, are the cornerstones of that master plan.

Today, the core campus is bounded by Bedford Street, Durham Street, Falmouth Street and Deering Avenue and characterized by ad hoc buildings and landscapes that are indicative of incremental growth and expedient design. There is no predominant architectural language and the open spaces of the campus are largely comprised of the negative space left over when buildings were sited as objects in the landscape. Seeking to create a legible hierarchy of both open space and building form, the proposed design for these two important new buildings grows directly from the aspirations of that Master Plan.

Campus Plan, Circulation and Open Space

The proposed residence hall anchors the corner of Durham and Bedford Streets, providing a strong corner to mark the arrival to the center of the campus moving west on Bedford Street, the primary urban arterial that moves through the campus. Reflecting the geometry of the Durham and Bedford intersection, the four wings of the residential building form a parallelogram that encloses a ½ acre semi private courtyard for the residents. The building has a large perimeter, which is mitigated by creating a five story lower portion that frames Bedford Street and the new Central Quad and a higher, eight story portion that frames Durham Street and the northern edge of the courtyard against the existing campus utility plant. The height of the lower Bedford Street wing is approximately the same height of the Wishcamper Center and Osher Map Library directly across the street. Together these buildings serve to define the street walls that mark the entrance to this part of the campus.

The lower Bedford Street wing of the residence hall turns to run parallel to Durham Street, forming the eastern edge of a new large, one acre Central Quad. This quad is an open, gently sloping green lawn that

will become the signature open space for the University, framed by Masterton Hall on the west, the new residence hall on the east, and set back almost 200' from the road, the new Career and Student Success Center ("CSSC") on the north.

The CSSC serves as a fulcrum in the overall campus plan, reconciling the non-parallel geometries of Bedford and Falmouth Streets. The façade facing Bedford Street terminates the Central Quad and offers a south facing grand portico, providing comfortable shade in the spring, summer and fall while providing weather protection in the winter. The west façade parallels the east façade of Masterton Hall and defines an important north – south cross-campus connector. The north or rear façade roughly parallels Falmouth street and creates the possibility that the future parking garage will work with the CSSC to frame and further extend the series of open spaces that loosely form an east – west green connector from Deering Avenue all the way to the Sullivan fitness center. The east façade, facing the utility plant, is parallel to Durham Street and serves as a loading dock for the CSSC.

Building Design

The buildings are designed to be a visual and tactile manifestation of the University's desire to "to build a sustainable, iconic academic campus in the heart of Portland enhancing the commuter experience while creating a welcoming residential community." Creating buildings that are didactically sustainable, welcoming, and tied directly to visual language of the nearby campus buildings have become the imperatives for our design. The residential building aspires to weave itself into the fabric of the campus in both its footprint and its fenestration while the Student Success Center seeks to become the iconic center of the campus. The buildings draw their material palette and fenestration patterns both from the immediate context of the campus and the "heart of Portland" – the downtown and the waterfront.

Residence Hall

The lower volume of the residence hall is characterized by essentially complete transparency all along the Bedford Street façade. The first floor behind this glass houses all of the public functions of the residence hall – the community kitchen, the living room, two seminar / classrooms, the bike room and the building's entry lobby. These spaces activate the sidewalk throughout the day and late into the evening, spilling light onto the sidewalk and making the campus a more welcoming, attractive and safe place. A long horizontal canopy leads pedestrians from the Wishcamper crosswalk and the corner of the Central Quad along Bedford Street to the bike and pedestrian lobbies, which form the primary entry to the residence hall. This canopy separates the public, transparent base of the building from the more private residences above, which are characterized by a regular grid of large windows punched into a panelized façade and five vertical bay windows, which mark the living rooms of select apartments. The canopy forms a protruding shelf to hold the freestanding letters that name the building and signify the entry. Like other buildings on campus and throughout the city, the lowest story of the residence hall is made of hand laid standard modular brick. The light and dark gray bricks accent the color palette of the recent Wishcamper and Osher buildings directly across Bedford street and give the residence hall a visually strong, durable base to rest upon.

Up above, along Durham Street and the edge of the existing Physical Plant the taller, 8-story volume of the residence hall is comprised of lighter materials, both in weight and color. The upper ranges of all the facades are a combination of large widows with passive house compliant frames, cement fiber panels and metal panels, creating a basket weave of windows and metal panels that alternate within bands of fiber-cement panels. These volumes are clad in the lighter panel colors to lessen their visual weight and tie them to the lighter modern architecture of the Wishcamper and Osher upper stories. The ratio of windows to walls within these facades reveal their residential use, which is a new building type on this campus. Incidentally, the lighter colors and materials of these two taller wings also serve to reflect more light into the residential courtyard, making it more enjoyable in all seasons.

The intersection of the taller and lower volumes at the corner of Durham and Bedford Streets provides an opportunity to mark this as a prominent corner for the University. The lower volume frames Bedford Street, but the taller volume sets back and places student lounges at the southern edge of the wing to create visual permeability into the building as well as a beacon of light emanating from the building in the evening and nighttime. The intersection of the two plan geometries gives the building a prow shape, with the point of the prow pointed to Downtown. Wrapping the floor to ceiling glass around this angular corner above the lower Bedford Street wing creates drama in the building form and allows unparalleled views of the peninsula skyline and Back Cove.

The residence hall employs myriad strategies to embrace the overarching objective of didactic sustainability. These strategies are highlighted within the building to educate the residents about their choices and the effects of those choices on all aspects of sustainability: environmental stewardship, social justice, and economic equity. One of the most aggressive sustainable features of the building is that it is designed to Passive House (PHIUS) standards. When completed, this building will use very little energy while providing residents with year-round comfort.

Career and Student Success Center

If the residence hall seeks to reinforce the structure of the city blocks and weave itself into the immediate context of the campus, the Career and Student Success Center seeks to stand apart, to become that iconic center of student life that welcomes both resident students and commuter students, as well as the public of Portland and beyond. Its place on the campus, its geometry, and its architectural language collectively seek to make this building the heart of social life for the campus. Like the residence hall, it is designed to be both didactically sustainable and welcoming, but unlike the residence hall, it has a larger, more civic scale that seeks to signify the importance and prominence of the University of Southern Maine in the state. The large scale begins with the soaring south facing portico. A broad gesture roughly 30’ tall, 20’ deep, and 200’ long, this portico forms a front porch to the campus, city, and state. It becomes the “band shell” at the top of the lawn, hosting events like graduations, concerts and the like. The columns of the portico are diagonal mass timber, making a clear statement that this university is invested in furthering the timber industry in the state, embracing sustainable and renewable low-carbon building technologies, and welcoming all in an informal, universally accessible manner. In short, it is a counterpoint to the formal, intimidating, large scale porticos of many other major universities’ iconic campus buildings.

Furthering the goal of being welcoming and promoting accessibility, the porch covers a two story mass timber framed lobby. Enclosed entirely in a transparent curtainwall, this dramatic lobby is anchored by a monumental stone fireplace and a soaring open stair, inviting all up to the second floor. On the ground floor, the lobby is adjacent to a large dining commons with a seating capacity of about 300. Serving a wide variety of locally sourced and sustainable foods, this dining commons uses food to attract both residential and commuting students to mix with faculty and staff from all around the campus. It becomes the indoor “town square” for the University.

The second floor is home to the Career Center and a 3,500 square foot multi-purpose room. This grand room also overlooks the Central Quad with a large glazed wall facing south under the overhang of the portico. It can be used for events ranging from career fairs, to large dinners, to dances and other celebratory events for both the campus and the community.

The materials that make up the CSSC are selected to tie the building to the essence of the state of Maine and the City of Portland. Materials are authentic, natural, and rugged. The mass timber framing of the public spaces speaks to the forestry industry in the state and the long history of the maritime industry in the Port. Dark mullions forming multi-paned windows in the large curtainwall expanses draw their visual characteristics from many of the historic wharf and commercial buildings in the City as well. The solid areas of the angular volume of the CSSC are clad in corrugated metal and natural stained wood in large planks – both selected for their prevalence in the industrial nature of both the historic and contemporary waterfront. Dark metal railings, light fixtures, and site furnishings also invoke the nobly utilitarian character of the waterfront and downtown buildings.

To maximize energy efficiency, the building is sited to take advantage of passive solar heating through the large glass openings facing south in the wintertime when the sun is low, while shading the glass with the portico overhang in the summer. The west, east, and north sides have fewer glazed openings and more solid walls to raise the energy efficiency of the entire building while still allowing daylight to penetrate deep into the interior spaces. The corrugated metal and wood cladding materials are relatively low carbon in their manufacture and shipping and can be recycled at the end of their long lifecycle. Above, on the roof, we are proposing a solar array that serves dual purposes: to provide shade for the roof membrane below (thus reducing heat gain through the roof in the summer), and to produce renewable energy for the electrical grid.

These and other sustainable strategies will enable the University and the development team to pursue a Silver level of LEED Certification for the CSSC, with an aspiration to push the certification even higher.

The Residence Hall and Career Student Success Center will be transformative projects for the University of Southern Maine in Portland. Designed with the imperatives of sustainability, accessibility, and legibility, these buildings tell the story of a University dedicated to the education and practice of living a sustainable lifestyle; welcoming people of all cultures and abilities; and being an iconic, innovative engine that drives the State’s economy.

COMMITMENT & INTEGRITY
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T 207.774.2112
F 207.774.6635

Via Electronic Mail

July 15, 2020

Department of Planning & Development
Attn: Matthew Grooms
City of Portland
389 Congress Street
Portland, ME 04101

Re: USM Career & Student Success Center and Residence Hall
Neighborhood Meeting Certification

To Whom It May Concern:

I, Darrin Stairs, PE of Woodard & Curran, hereby certify that a neighborhood meeting was held on July 15, 2020, at via a virtual (Zoom) meeting, at 6:00 pm regarding the Level III Site Plan Submittal for the proposed **USM Career & Student Success Center and Residence Hall** project located at 23 Bedford Street.

I also certify that on July 2, 2020, invitations were mailed to the following:

1. All addresses on the abutters list provided by the Planning Division which includes property owners within 500 feet of the proposed development.

2. Residents on the "interested parties" list.

Signed,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

Attached to this certification are:

1. Copy of the invitation sent
2. Attendees List
3. Meeting Notes
4. Presentation Slides

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July 2, 2020

Dear Neighbor:

On behalf of the University of Southern Maine (Applicant), please join us for a neighborhood meeting to discuss the University's plans for a new Career and Student Success Center and Residence Hall, to be located at 23 Bedford Street in Portland, Maine. A Level III Site Plan Application for the development has been filed with the City of Portland Planning Division on behalf of the Applicant.

Meeting Location: Virtual Zoom Meeting. Register at the following link to receive a Zoom invitation to the meeting: https://usm.maine.edu/finance/forms-0

Meeting Date: Wednesday, July 15, 2020

Meeting Time: Meeting open at 5:30 PM, EST; Presentation to begin at 6:00 PM EST

The City code requires that property owners within 500 feet of the proposed development and residents on an "interested parties list" be invited to participate in a neighborhood meeting. Attendance will be taken, and minutes recorded and submitted to the Planning Board.

If you have any questions, please contact Darrin Stairs at (207) 558-3662 or via email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

Note: Under Section 14-32(C) and 14-524(a)d of the City Code of Ordinances, an applicant for a Level III development is required to hold a neighborhood meeting within 30 days of submitting a preliminary application or 21 days of submitting a final site plan application, if a preliminary plan was not submitted. The neighborhood meeting must be held at least seven days prior to the Planning Board public hearing on the proposal. Should you wish to offer additional comments on this proposed development, you may contact the Planning Division at 874-8721 or send written correspondence to the Planning and Urban Development Department, Planning Division, 4th Floor, 389 Congress Street Portland, ME 04101 or by email: to jrather@portlandmaine.gov.

USM CSSC & Portland Commons Neighborhood Meeting
July 15, 2020 6:00pm-7:00pm
Attendees List

Name	email address	Address
Aaron Witham	aaron.z.witham@maine.edu	1677 Royalsborough Rd, Durham, ME
Alec Porteous	alexander.porteous@maine.edu	USM
Ann Vashon	ann.vashon@maine.edu	Maine
Brenda Nicholas	rnichol1@maine.rr.com	
Carolyn McDonough	cmcdonou@maine.edu	5765 Service Building
Craig Piper, SMRT Architec	cpiper@smrtinc.com	105 Loveitts Field Road, South Portland, Maine 04106
Darrin Stairs	dstairs@woodardcurran.com	41 Hutchins Drive
DAVID E WEEKS	dweeks01@maine.rr.com	355 Forest Avenue
David E. Roussel	david.roussel@maine.edu	
Dawn Gay	dgay@llbean.com	8 Chamberlain Ave
Glenn Cumings	glennc@maine.edu	24 Nevins Street
Jeanne Paquette	jeanne.paquette@maine.edu	USM Bedford Street, Portland, Maine
Joe Picoraro	jpicoraro@pcconstruction.com	193 Presumpscot Street
John Lewandowski	jrl@maine.rr.com	132 Brighton Ave
John Souther	John.souther@maine.edu	42 Bailey Farm Rd, Freeport Me 04032
Kate Snyder	ksnyder@portlandmaine.gov	389 Congress Street
Katie Mahoney	katherine.mahoney@maine.edu	494 Deering Avenue
Kristin Sweeney	sweeneykg@gmail.com	167 Caleb St
Lachelle Lackey	lachelle.lackey@maine.edu	25 Bedford St.
Mary Costigan	mcostigan@bernsteinshur.com	100 Middle St
Paul A Kuplinski	paul.kuplinski@maine.edu	PO Box 9300, Portland, ME
Philip Chaney	pchaney@smrtinc.com	80 Brentwood Street
Ross Cameron	rcameron@elkus-manfredi.com	25 Drydock Ave
Samantha Warren	samantha.warren@maine.edu	70 Kent Street
STEPHEN WILKINS	Swilkins@pcconstruction.com	
Susan Fekety	sfekety@gwi.net	125 Bolton Street
Thomas Blanchard	thomas.blanchard@maine.edu	25 Bedford St, Portland, ME 04101
Jennifer Conley		
Laurie Davis		
Annie Anderson		72 Pitt Street

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NEIGHBORHOOD MEETING NOTES

PROJECT: USM Career & Student Success Center and Portland Commons Residence Hall

MEETING DATE: 7/15/2020

LOCATION: Virtual Meeting (Zoom)

This neighborhood meeting for the proposed USM Career & Student Success Center and Portland Commons Residence Hall was held virtually via the Zoom platform on July 15th.

The zoom meeting was opened at 5:30pm to allow for attendees to log in and resolve technical difficulties.

The presentation began at 6:00pm and lasted approximately 45 minutes. A link to the presentation was shared with all registered attendees earlier in the day, and a copy of the presentation is attached.

Alec Porteous, Chief Operating Officer & Chief Business Officer for USM, opened the meeting and welcomed attendees.

Darrin Stairs, Project Manager at Woodard & Curran, reviewed the meeting details, including the application currently being considered, contacts at City Planning and the University, and specifics on how to ask questions or comment via the virtual platform at the end of the meeting.

Mr. Porteous then introduced executive and senior staff in attendance from USM and the University of Maine System, as well as the project team of which he would speak in more detail later in the meeting.

Mr. Porteous then introduced USM President Glenn Cummings.

President Cummings welcomed all attendees and recognized Mayor Snyder who was in attendance and is a resident of the neighborhood. Mr. Cummings thanked the Mayor for her support of the project.

President Cummings spoke of the transformational effects that the proposed projects would have on the Portland campus, including replacing the existing parking lot with a green quad that would become the centerpiece of the campus. This quad will be a resource for the students and staff as well as the surrounding community. The President also described the Career & Student Success Center, including a dining room, café/pub, fireside student lounge, a state-of-the-art Career services center, and dedicated student life offices. President Cummings explained that the proposed 577-bed residence hall will add a residential life component not currently present on the campus that will couple with the state-of-the-art student center. Students that will reside in the new hall will be primarily be upper-level and graduate students. The President then turned the presentation back over to Mr. Porteous.

Mr. Porteous gave an overview of the project, beginning with the timeline that began with the Project initiation in June of 2018 and will culminate with the completion of construction in the Spring of 2013.

Mr. Porteous introduced the project team by organization and described the role that each is playing on the project.

Mr. Porteous reviewed the project background for the Residence Hall (Portland Commons). He shared a rendering view from Bedford Street and explained the architects would share a description of the design elements later in the presentation.

Mr. Porteous stated that enrollment at USM from 2015 to 2020 has grown by 7.3%. He explained that this has led to over-occupancy on the Gorham Campus, and that even during the current pandemic USM is seeing housing requests in excess of occupancy for the Gorham Dorms. Upper Class, Graduate and Law School students struggle to find affordable housing in the Greater Portland area. Portland Commons

will alleviate this housing shortage and enable USM and UMS to take advantage of the national and international appeal of the Portland Area. Mr. Porteous explained that the 2018 Brailsford and Dunlavey market analysis justified 550-600 beds on the Portland campus without cannibalizing occupancy on the Gorham Campus.

Mr. Porteous reviewed the Project Details for Portland Commons, including that it would be the largest Passive House residence hall in New England and among the five largest in the U.S. He explained that the Portland Campus has had Portland based residential options in the past, but never on-campus housing. The residence will be a short walk from the new quad, the student center, and academic buildings.

Mr. Porteous shared project background for the Career & Student Success Center, including that it will be approximately 40,000 sf, will seek LEED Certification, and will feature mass timber and cross laminated timber. Mr. Porteous reviewed the building programming, including: first floor – dining, pub/café. University Store and welcome center; second floor- 13,500 sf Career Center with multipurpose event room overlooking the quad, interview rooms for employers; and third floor – student affairs offices, student government, student lounges and study spaces. Mr. Porteous acknowledged the generous support of the Maine voters in 2018 that authorized $49 Million in bonding to modernize UMS facilities to attract and retain students to Maine. Mr. Porteous then turned the presentation over to Aaron Witham, Assistant Director of Facilities Management for Sustainability, to review Transportation and Parking related issues.

Mr. Witham reviewed the transportation studies that have been completed to date by VHB, including: A Parking Study, Transportation Demand Management (TDM) study, and a Traffic Study. He reviewed the current status of parking supply on campus – showing a map of current lots and parking counts. Mr. Witham recounted that findings of the parking study that showed peak parking times are generally in the middle of the week days, between 12:00 and 1:30.

Mr. Witham then reviewed other related Parking Projects that are not part of this application. These included: A Structured Parking Feasibility Study completed by Platz in 2019; the plan to construct a 425-500 space parking garage near the Sullivan Gym; and the construction of the Wishcamper Parking lot in 2021. Mr. Witham shared a map that showed the future parking supply with the displaced spaces lost to construction of the City Roundabout project and the CSSC/Residence Hall, and the added spaces expected from the Wishcamper Parking lot renovation and the new structured parking garage.

Mr. Witham then concluded reviewing the Traffic Impact Analysis expected with this project. He explained that the Residence Hall is not a creator of new trips to the campus, but rather replaces a significant number of commuter trips with students now able to walk to classes and activities rather than drive. The net result is a decrease in peak daily trips - with the majority of resident trips occurring outside of peak hours and on weekends. The Student Center is also not believed to be a generator of trips, as it is an accessory function to campus activities and is replacing the existing student center. The exception would be some special events. Mr. Witham explained the primary driver for increased trips on the campus will come from increases in enrollment. The slight increases expected in traffic at area intersections are already being accommodated for with current and proposed City improvement projects, including the roundabout at Deering and Brighton Avenue. Mr. Witham then turned the presentation over to Craig Piper of SMRT Architects.

Mr. Piper reviewed the Project Design and Architectural standards. The proposed residence hall anchors the corner of Durham and Bedford Streets, providing a strong corner to mark the arrival to the center of the campus moving west on Bedford Street, the primary urban arterial that moves through the campus. Reflecting the geometry of the Durham and Bedford intersection, the four wings of the residential building

form a parallelogram that encloses a ½ acre semiprivate courtyard for the residents. The Residence Hall building has a large perimeter, which is mitigated by creating a five story lower portion that frames Bedford Street and the new Central Quad and a higher, eight story portion that frames Durham Street and the northern edge of the courtyard against the existing campus utility plant. The height of the lower Bedford Street wing is approximately the same height of the Wishcamper Center and Osher Map Library directly across the street. Together these buildings serve to define the street walls that mark the entrance to this part of the campus. The lower Bedford Street wing of the residence hall turns to run parallel to Durham Street, forming the eastern edge of a new large, one-acre Central Quad. This quad is an open, gently sloping green lawn that will become the signature open space for the University, framed by Masterton Hall on the west, the new residence hall on the east, and set back almost 200' from the road, the new Career and Student Success Center ("CSSC") on the north. The CSSC serves as a fulcrum in the overall campus plan, reconciling the non-parallel geometries of Bedford and Falmouth Streets. The façade facing Bedford Street terminates the Central Quad and offers a south facing grand portico, providing comfortable shade in the spring, summer and fall while providing weather protection in the winter. The west façade parallels the east façade of Masterton Hall and defines an important north – south cross-campus connector. The north or rear façade roughly parallels Falmouth street and creates the possibility that the future parking garage will work with the CSSC to frame and further extend the series of open spaces that loosely form an east – west green connector from Deering Avenue all the way to the Sullivan fitness center. The east façade, facing the utility plant, is parallel to Durham Street and serves as a loading dock for the CSSC.

The buildings are designed to be a visual and tactile manifestation of the University's desire to "to build a sustainable, iconic academic campus in the heart of Portland enhancing the commuter experience while creating a welcoming residential community." Creating buildings that are didactically sustainable, welcoming, and tied directly to visual language of the nearby campus buildings have become the imperatives for our design. The residential building aspires to weave itself into the fabric of the campus in both its footprint and its fenestration while the Student Success Center seeks to become the iconic center of the campus. The buildings draw their material palette and fenestration patterns both from the immediate context of the campus and the "heart of Portland" – the downtown and the waterfront.

The lower volume of the residence hall is characterized by essentially complete transparency all along the Bedford Street façade. The first floor behind this glass houses all of the public functions of the residence hall – the community kitchen, the living room, two seminar / classrooms, the bike room and the building's entry lobby. These spaces activate the sidewalk throughout the day and late into the evening, spilling light onto the sidewalk and making the campus a more welcoming, attractive and safe place. A long horizontal canopy leads pedestrians from the Wishcamper crosswalk and the corner of the Central Quad along Bedford Street to the bike and pedestrian lobbies, which form the primary entry to the residence hall.

Up above, along Durham Street and the edge of the existing Physical Plant the taller, 8-story volume of the residence hall is comprised of lighter materials, both in weight and color. The upper ranges of all the facades are a combination of large widows with passive house compliant frames, cement fiber panels and metal panels, creating a basket weave of windows and metal panels that alternate within bands of fiber-cement panels.

The intersection of the taller and lower volumes at the corner of Durham and Bedford Streets provides an opportunity to mark this as a prominent corner for the University. The lower volume frames Bedford Street, but the taller volume sets back and places student lounges at the southern edge of the wing to create visual permeability into the building as well as a beacon of light emanating from the building in the evening and nighttime.

The residence hall employs myriad strategies to embrace the overarching objective of didactic sustainability. These strategies are highlighted within the building to educate the residents about their choices and the effects of those choices on all aspects of sustainability: environmental stewardship, social justice, and economic equity. One of the most aggressive sustainable features of the building is that it is designed to Passive House (PHIUS) standards. When completed, this building will use very little energy while providing residents with year-round comfort.

The Residence Hall and Career Student Success Center will be transformative projects for the University of Southern Maine in Portland. Designed with the imperatives of sustainability, accessibility, and legibility, these buildings tell the story of a University dedicated to the education and practice of living a sustainable lifestyle; welcoming people of all cultures and abilities; and being an iconic, innovative engine that drives the State's economy.

Mr. Piper turned the presentation over to Alec Porteous who concluded with the reaffirmation that the CSSC and the new residence hall and campus quad will fulfill a significant portion of the Portland Campus Master Plan and will transform the campus.

At this time the meeting was opened to questions and comments from the neighborhood. No questions were asked, but the following comments were received.

Comment 1: Really appreciate the presentation and the planning that has been done. Thank you

Comment 2: This is very exciting to see! The architecture is stunning and it feels like what USM had needed.

Comment 3: No questions, but agree that it is attractive project that will help to define the campus. Good work!

After waiting for a few minutes and seeing no additional questions or comments, both Mr. Porteous and President Cummings thanked all for their attending and for the kind comments that were received.

The Neighborhood Meeting concluded at approximately 7:00 PM.

UNIVERSITY OF SOUTHERN MAINE

Career & Student Success Center / Portland Commons

Neighborhood Meeting

July 15, 2020

Presentation Details

- Level III Site Plan Application: PL-001040-2020, 23-25 Bedford Street
- City of Portland Planning Division – 207.874.8719
- Planner Assigned: Matthew Grooms
- Development Review Services Manager: James Rather

- Q&A Discussion
  - Raise hand feature
  - Chat feature
  - Technical issues: Please contact Katie Mahoney (katherine.mahoney@maine.edu)
  - Future project inquires: Alec Porteous (alexander.porteous@maine.edu)

Presentation Agenda

1. *Welcome / Introductions*
2. *Project Overview*
3. *Project Background – Portland Commons*
4. *Project Background – Career & Student Success Center*
5. *Related Parking & Transportation Planning*
6. *Project Design & Architectural Renderings*
7. *Questions / Discussion*

Transforming USM's Portland Campus

- **USM's proposed Career and Student Success Center (CSSC) and Portland Commons Residence Hall will have a transformational effect on the University's Portland campus.**

- Portland campus adds residential life component → **Project adds a 577-bed residence hall** to a campus that has never had on-campus housing and couples that with a state-of-the-art student center.

- Career & Student Success Center takes center stage → Building will include a spacious dining room flanked by a café/pub, and fireside student lounge. The second floor will include office, meeting, and event space dedicated to career services, and the third floor will be dedicated to student affairs offices, lounges and programming.

- Surface parking lot centerpiece becomes Green Quad → **central quad will serve as entry-point to Portland campus,** providing key functionality and aesthetic appeal. The quad will be a resource for all students, staff and faculty and the surrounding community, as well.

Career & Student Success Center Residence Hall

Aerial



PROJECT OVERVIEW

Project Overview – Timeline / Process

Work-to-Date

- **June 2018:** Project initiation → Formation of USM President's P3 Committee (USM & UMS committee members).

- **January 2019:** UMS Trustees approve USM's Master Plan, which includes the concept of a Career & Student Success Center as well as a significant residence hall and the transformation of the Portland campus' Bedford Street Parking Lot into a green quad.

- **July – December 2019:** USM/UMS conduct RFQ and RFP processes.
  - Capstone Development Partners selected in a competitive project process to develop jointly CSSC / Portland Commons

- **January 2020 – Present:** BOT approval of PDA, project advances.
  - USM/UMS and Capstone team advance project through design stages; reevaluate plans due to COVID-19; execute PDA

Project Overview – Timeline / Process (cont'd)

Next Steps

- **July 15, 2020:** Neighborhood meeting.
- **Late Summer / Fall 2020 :** City of Portland Planning Board Process.
- **Spring 2021:** Demolition of Woodbury Student Center and 25 Bedford Street (Department of Facilities Management building).
- **Spring 2021:** Begin construction of CSSC and Portland Commons project.
- **Spring 2023:** Complete construction and open to students and University community.

Project Overview – Team

UNIVERSITY OF SOUTHERN MAINE

Maine's Public Universities
UNIVERSITY OF MAINE SYSTEM

CAPSTONE DEVELOPMENT PARTNERS

SMRT

ELKUS | MANFREDI ARCHITECTS

PC CONSTRUCTION

cmp CAPSTONE MANAGEMENT PARTNERS

WOODARD & CURRAN

Steven Winter Associates, Inc.

PROJECT BACKGROUND – PORTLAND COMMONS

Career & Student Success Center
Portland Commons Residence Hall
Bedford St. Corner – Spring Scene



Project Background – Portland Commons

- **From 2015 to 2020, USM grew student enrollment by 7.3%.**
  - Robust enrollment growth has led to over-occupancy in residence halls on the Gorham campus
  - Even during the COVID-19 pandemic, USM is seeing housing requests exceed natural occupancy for the Gorham dorms

- **Upper Class, Graduate and Law School students struggle to find affordable housing in the Greater Portland area.**
  - Portland Commons will help alleviate this housing shortage and will enable USM and the University of Maine System to take advantage of the City of Portland's national and international appeal

- **A 2018 Brailsford and Dunlavey market analysis demonstrated that USM could add 550 to 600 beds** on the Portland campus without cannibalizing occupancy in the Gorham campus residence halls.

Project Details – Portland Commons

- **577-bed, 220,000 square foot Portland Commons Residence Hall will be built to Passive House standards.**
  - Portland Commons will be the largest Passive House residence hall in New England and will be among top five largest in the U.S.
  - Passive House lowers energy use and emissions, cutting utility bill by >50% compared to building to current standard code
- **Portland Commons achieves two major goals of establishing Portland as a residential campus and adding an affordable housing option** for upper class, graduate and Maine Law students.
  - While USM has had Portland-based residential options in the past, the Portland campus has never had on-campus housing
  - Fronted by a green quad, Portland Commons will be a short walk to all Portland campus academic buildings and the proposed Graduate Student Center
  - With Portland housing prices continuing to climb, and demand continuing to grow, Portland Commons will offer a unique alternative to students seeking to live and study in the city

PROJECT BACKGROUND – CAREER & STUDENT SUCCESS CENTER

Career & Student Success Center
Residence Hall
Long View of CSSC from Bedford Street Crosswalk



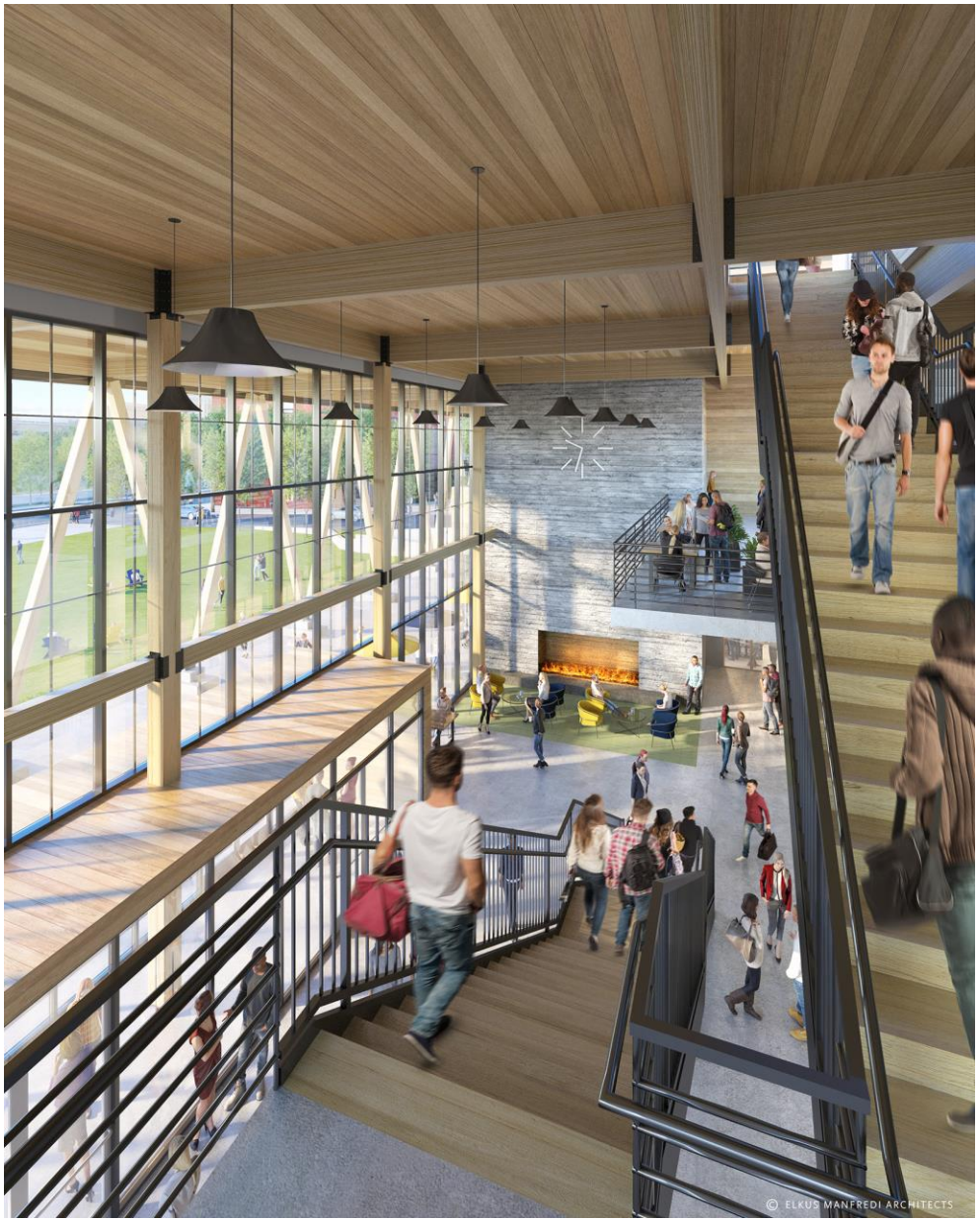
Project Background – Career & Student Success Center

Approx. 40,000 square feet;

LEED Certification;

Mass Timber / Cross Laminated Timber

- Dining Services
- Career Services / Career Hub
- Student Organizations
- Open Spaces / Lounges for Students
- Diversity Center
- Multi-purpose room
- University Store
- SGA
- Husky Dining Room



Project Details – Career & Student Success Center

- **The Career & Student Success Center will help fulfill the needs of USM's growing and increasingly diverse student body.** Key input from students and Student Affairs staff members has helped shape the composition of the CSSC.

  - **First Floor:** 300+ seat dining, adjacent café/pub, fireside student lounge, University Store and welcome center

  - **Second Floor:** 13,500 square foot Career Center, equipped with a multipurpose event room overlooking the green quad, office suite for career advisers, interview rooms for employers visiting campus or Zoom interviews, Husky Dining Room overlooking the first floor

  - **Third Floor:** Student Affairs focus, with 1,840 square foot Diversity & Intercultural Center overlooking the campus green, Student Government Office, Student Affairs Programming Office, student lounges and study spaces

Project Details – Career & Student Success Center (cont'd)

- **With the generous support of Maine voters,** the Career & Student Success Center will fulfill USM's commitment to enhanced career advisory and placement services that keeps Maine students in our state and attracts out-of-state students to live and work in Maine.

  - ***This commitment responds to the successful passage of Question 4 on the 2018 ballot,*** *which authorized $49 million in bonding for modernizing UMS facilities to attract and retain students to Maine.*

- **President Cummings and the USM Foundation led the bond campaign for USM,** and the President responded to the successful outcome by saying:

  - *"For our students, passage of Question 4 will translate to an enhanced learning environment, better preparation for future careers, and more integrated interaction with area employers. For the rest of us, yesterday marked a key date in our steady approach to becoming a truly great university."*

RELATED PARKING & TRANSPORTATION PLANNING

Transportation Studies

- In 2019 USM hired VHB, renowned transportation consultant, to conduct studies & guide planning efforts
  - Parking study
  - Transportation Demand Management (TDM) study
  - Traffic study



Parking Supply on Campus: Current Status



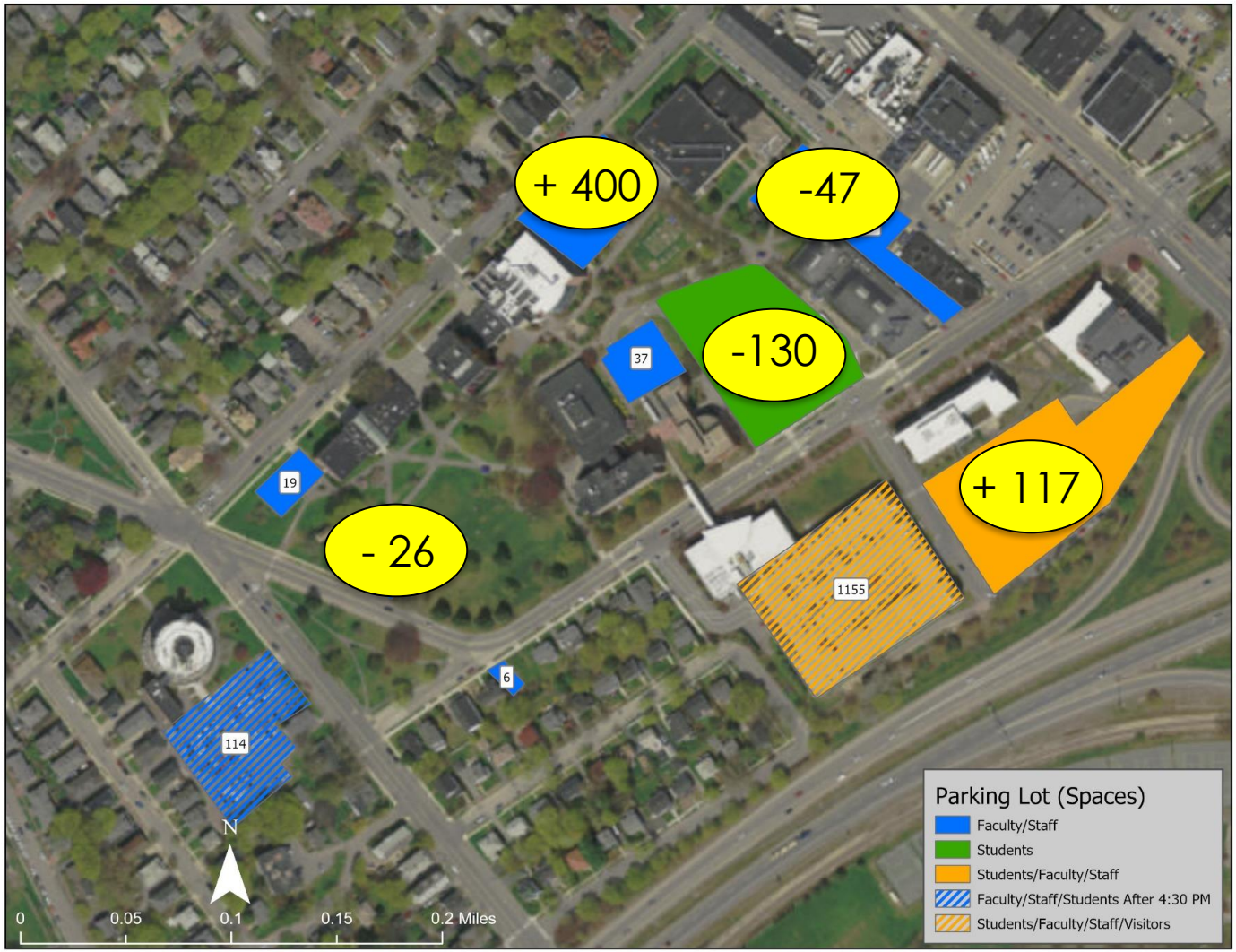
Related Parking Projects

- **Structured Parking Feasibility Study:** During Summer 2019, USM contracted with Platz Associates to review options for additional structured parking on USM's Portland Campus.

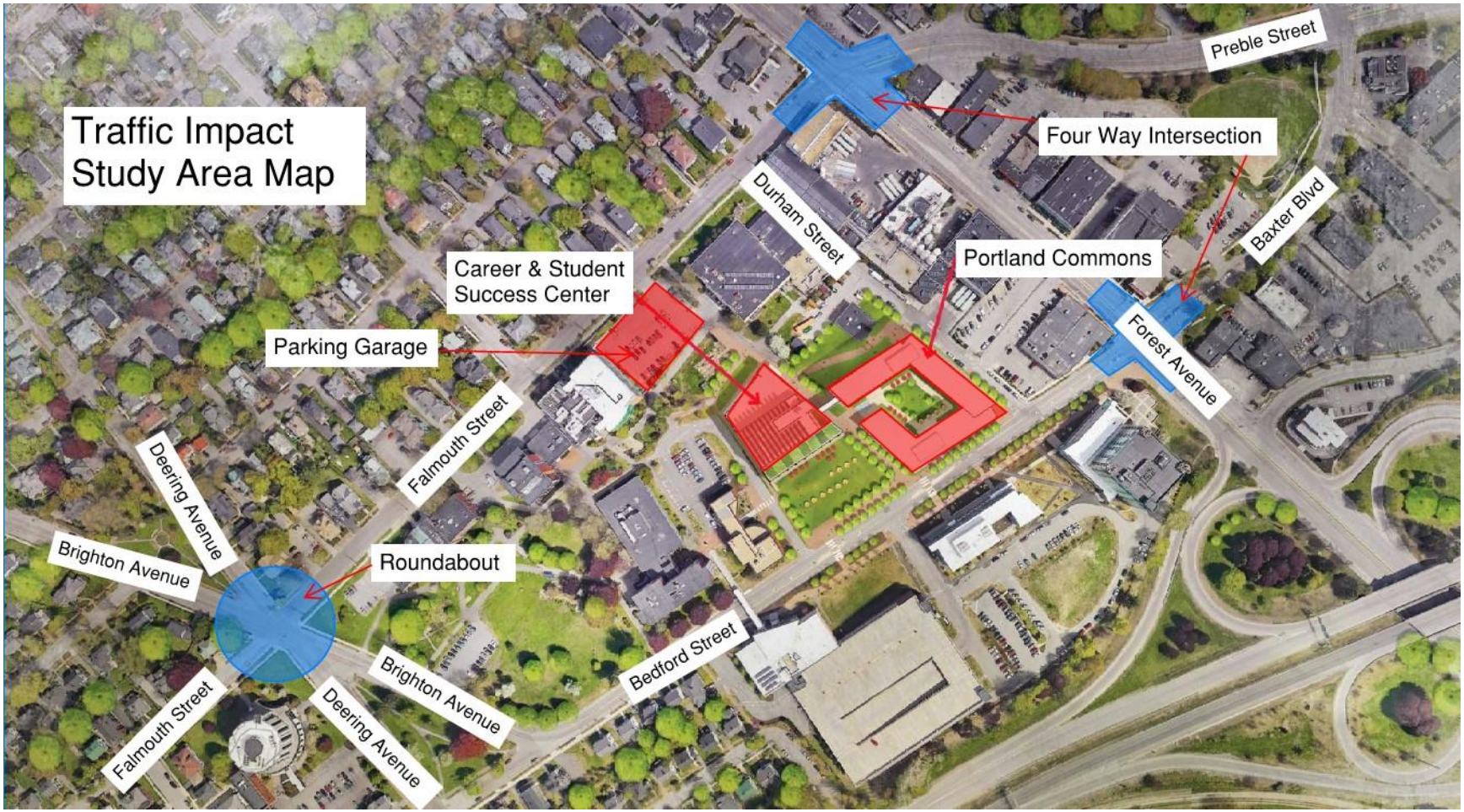
- **Sullivan Lot Garage:** In February, USM received BOT approval to construct a 425-500 space parking garage in the Sullivan Gym surface parking lot.
  - Desman Design Management selected to design garage
  - Project will have a separate Planning Board process
  - Construction to be completed in the Spring of 2023

- **Wishcamper Parking Lot:** In May, USM received approval from the City of Portland Planning Board to revise the Wishcamper Parking Lot, adding approximately 120 spaces.
  - Construction to be completed during Summer 2021

Parking Supply on Campus: Future Status

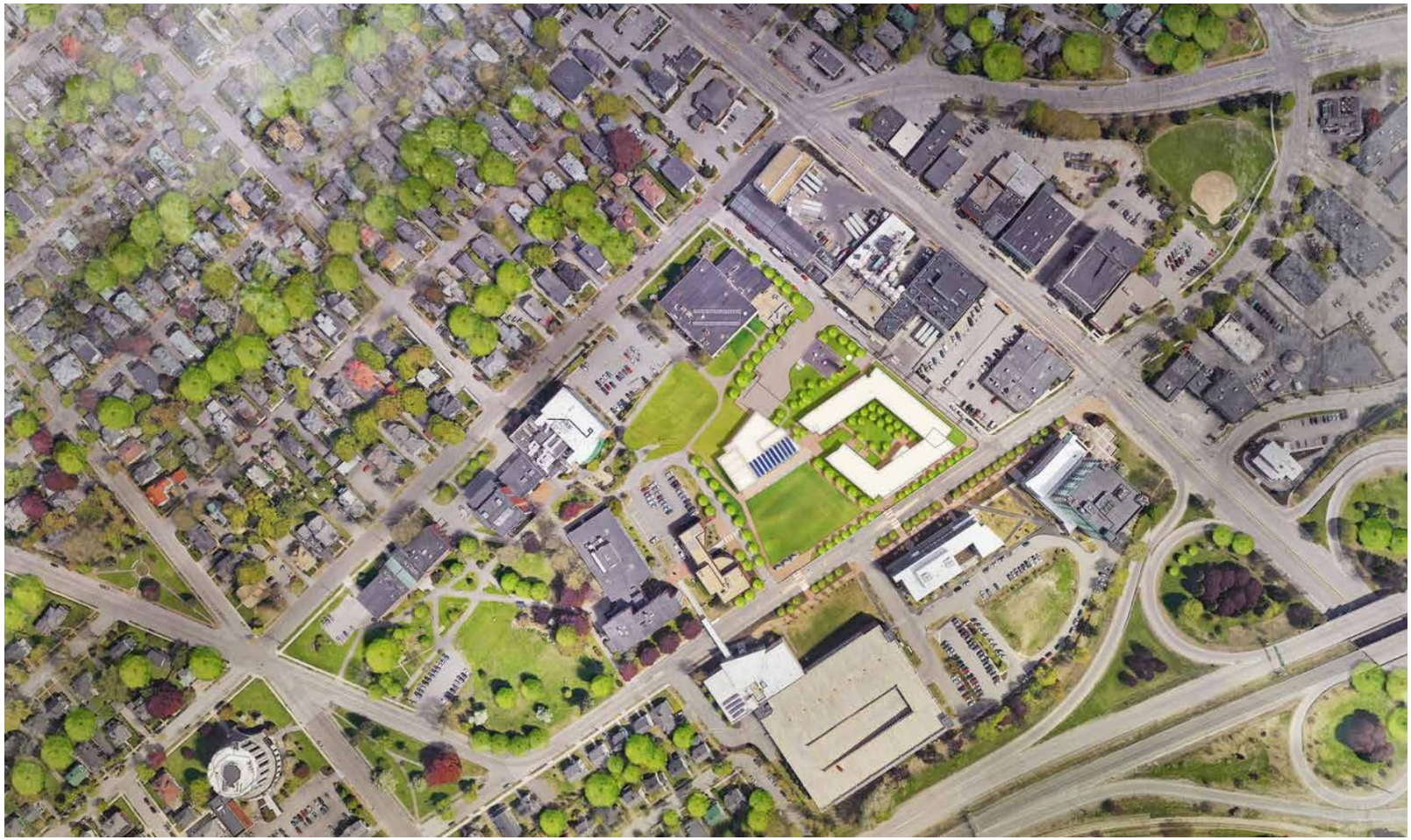


Traffic Impact Analysis



PROJECT DESIGN & ARCHITECTURAL RENDERINGS

Career & Student Success Center
Residence Hall
Site Plan



Career & Student Success Center Residence Hall

Overall Bird's Eye



Career & Student Success Center
Residence Hall
Entry View of Residence Community



Career & Student Success Center
Residence Hall
Residence Hall View Along Durham Street



Career & Student Success Center Residence Hall

Bedford Street View in Spring



Career & Student Success Center Residence Hall

Bedford Street View in Winter



Career & Student Success Center
Residence Hall
Long View of CSSC from Bedford Street Crosswalk



Career & Student Success Center
Residence Hall

Career & Student Success Center South Facade



Career & Student Success Center
Residence Hall

Career and Student Success Center Portico



Career & Student Success Center Residence Hall

Overall Bird's Eye



CONCLUSION

Conclusion

- The Career & Student Success Center, Portland Commons Residence Hall, and the Green Quad will **fulfill a significant portion of USM's Portland Campus Master Plan.**

- The project will transform USM's Portland campus, adding on-campus housing and creating a state-of-the-art Career & Student Success Center.
  - Students will be able to congregate to meet, dine, study and pursue career-related activities
  - **Project will frame a campus green that will become USM's Portland entryway**

- The project will be flanked by a modern parking garage and bolstered by a transportation demand management plan that ensures adequate parking and seeks to reduce campus traffic and distribute it more evenly.

QUESTIONS / DISCUSSION

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To: Matthew Grooms, Senior Planner, City of Portland **Date:** 7/17/2020

From: Aaron Witham, Asst. Dir. Facilities Management, University of Southern Maine

Project: PL-001040-2020, 25 Bedford St. (USM Career & Student Success Center and Residential Hall)

Re: University of Southern Maine Impact on Street Parking Adjacent to Portland Campus

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As a follow-up to previous conversations between the City of Portland and the University of Southern Maine on May 13th and June 3rd, 2020, City officials asked the University to estimate its total maximum impact of parking on public streets adjacent to the Portland campus. This memo summarizes that analysis.

Summary:

- From Monday, June 8th through Wednesday, June 10th, the University's Office of Sustainability collected street occupancy data between the hours of 12:30-1:30 pm, corresponding to the peak parking demand in campus lots.
- Occupancy of existing spaces averaged 31% in June, compared to the previous inventory done by VHB in October of 2019, which yielded a 62% occupancy.
- Since the October data set did not include detail about who was parking on the streets, an alternative method for estimating USM's total potential impact had to be employed.
- USM's total potential impact was estimated by subtracting the June data set (when campus was closed) from the October data set (when campus was open and classes were in session) during the 12:30-1:30 pm time slot.
- The estimation of USM's total potential impact is 62 vehicles.
- See attachment #1 for a street-by-street comparison and a list of the assumptions made.
- According to VHB, there were 202 parking spaces on the streets adjacent to campus under Fall, 2019 conditions. Seventy-seven of the spaces on these streets were open during peak parking demand when classes were in session.

Long-term Implications of University's Impact on Public Streets:

- At the completion of the roundabout project in September of 2021, there will be a minimum of between 159-173 [1]spaces on public streets adjacent to campus (depending on whether the City maintains existing parking on Bedford Street). This leaves between 34-48 open spaces during USM's peak parking demand time.
- On campus, total parking available will be between 1,977-2,052 spaces (depending on how big the new garage is). Total demand is anticipated to be 1,952 maximum (not including the effect of USM's

[1] These space counts are lower than before construction not only because of the loss of parking adjacent to Bedford park, but also because of the anticipated loss of six public parking spaces on Falmouth St. and six on Durham St. in order to create adequate sightline distances for safety surrounding the Falmouth street parking garage driveway and the Durham street Career & Student Success Center driveway, respectively. Exactly how many spaces will be lost will need to be determined by the City.

Transportation Demand Management Plan). This leaves between 25-100 open spaces during USM's peak parking demand time.

- Therefore, the University lots could accommodate the University's portion of public street parking by building an appropriately sized garage and/or by employing modest TDM (Transportation Demand Management) measures.

Short-term Implications of University's Impact on Public Streets:

- Parking availability will be lower than it is now due to the roundabout construction and University construction between March of 2021 and June of 2023.
- At the lowest point for street parking, availability goes from 202 to 182 spaces between March 2021 and September 2021. Fifty-seven spaces will still be available, according to the survey analysis.
- For most of the University's construction period, availability on campus goes from 1,701 to 1,537[2] spaces between September of 2021 and February of 2023 due to a combination of the roundabout project and the University's own construction projects. This leaves a 50 fewer spaces than Fall 2019 demand at the peak parking demand hour.
- From March of 2021 through early May of 2021, availability on campus will be 1,422. This amounts to 165 fewer spaces than Fall 2019 demand at the peak parking demand hour. Supply then drops to 1,331 over the summer, but demand for parking is extremely low over the summer and can be fully accommodated by the existing parking garage.
- The University does not expect these temporary parking capacity reductions on campus to be actual deficits given significant reductions in expected demand due to Covid, such as less in-person classes and a high number of telecommuting staff.
- If the number of in-person classes rebound in the Spring to levels comparable to last Fall, the University will manage demand for parking through initiatives that are already underway, such as a major course schedule revision. Prior to the outbreak of Covid-19, USM introduced a new time block schedule for Academic Year 2020-2021 to spread classes more significantly across days and time periods.
- Under a post-Covid "return-to-normal" scenario, the University's traffic consultant VHB believes that the University's TDM initiatives to expand offerings for telecommuting and efforts to spread out the course schedule can not only accommodate the reduced capacity in campus lots, but can also theoretically absorb USM's impact on on-street parking. Moreover, they estimate that the collective impact of the University's TDM plan can reduce parking demand by up to 12% (i.e. 234 spaces).

[2] Original projections submitted to the City within VHB's parking analysis totaled 1,552. Since then, the Wishcamper lot expansion was approved by the City with five less spaces than proposed in the permit application, and the central heat plant lot is now contemplated to possibly be turned into a temporary delivery area for a temporary kitchen location for Sodexo in Sullivan Gym; however, the University is more likely to find an off-campus location for Sodexo's operations. Regardless, when the new Career & Student Success Center opens, 15 spaces in the heat plant lot will be available.

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TDM Initiative #1- Promotion of Telework & Flexwork Policies:

- The University's TDM plan includes the promotion of telework & flexwork policies.
- Due to the Covid-19 outbreak, the University has had the opportunity experiment with telework & flexwork at a much higher volume than any time in the past and has found it to be successful in many cases.
- Telecommuting for many of these employees will continue through this December. The extent of telecommuting into the future is yet to be determined, but will be planned strategically to accomplish parking reduction, utility reduction, and Covid mitigation goals, as these factors evolve.

TDM Initiative #2- Course Schedule Revision:

- Before the pandemic, the USM Registrar revised the overall architecture of the course schedule to begin this Fall.
- The revision will lengthen the daily course schedule with a 45-minute earlier start for the first block in the morning.
- It will also spread out classes throughout the day by offering one additional daytime block and one additional evening block.
- The spreading out will result in more classes being held in off-peak hours when demand for parking is less.
- Additionally, the new structure will align the schedules more effectively between Portland and Gorham campuses, so that students can more easily use the METRO to travel between campuses and not have to cause congestion and parking issues by getting in their cars.

In the event that in-person classes resume to full capacity next Spring, then the University can take additional measures if necessary beyond telecommuting and course schedule revision to ensure that demand for parking doesn't exceed supply over the critical months of March, April, and May of 2021. Such measures could include:

- Working with METRO to increase frequency of bus routes and using the Gorham campus as a park & ride for employees
- Employing a private shuttle service to utilize remote lots
- Other initiatives outlined in USM's Transportation Demand Management Plan

Please let us know if you have any follow-up questions.

Sincerely,



Aaron Witham
Assistant Director of Facilities Management for Sustainability

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Attachment #1

Average Occupancy on Streets Adjacent to Campus on Monday-Wednesday between 12:30-1:30 pm

Street Name	Total Spaces	October 2019 Average Occupancy	June 2020 Average Occupancy	**Average Occupancy Difference**
Durham Street (Campus Side)	25	21	16	**5**
Falmouth Street (Forest to Brighton)	69	44	9	**35**
Falmouth Street (Brighton to Exeter)	9	7	3	**4**
Oakdale Street (Falmouth to Fessenden)	6	3	4	**-1**
Deering Ave (Brighton to 295)	21	16	6	**11**
Brighton Ave (adj to Bedford Park)	17	4	3	**2**
Exeter Street (Falmouth to Granite)	14	13	9	**4**
Bedford Street (adj to Bedford Park)	14	6	1	**5**
Chamberlain Ave	14	5	9	**-4**
Surrenden Street	13	4	3	**1**
All Streets	202	125	63	**62**

Notes:

*October data were collected as part of the VHB parking inventory at the same time the campus data were collected.

*Counts were taken between 8:30 am-4:30 pm, from Monday Oct. 21st- Wednesday October 23rd, 2019, and between 12:30-1:30pm from Monday June 8- Wednesday June 10.

*Occupancy shown here is just for the 12:30-1:30 pm time slot, as that is when peak parking demand occurs on campus.

*Peak parking demand was determined by when parking lots on the USM campus are the most full, according to an inventory done by VHB.

*The previously shared May data set only included a few streets and thus has been omitted from this table comparing average occupancy across all streets. Data for the same streets were comparable between the May and June data sets.

*The summary of data offered here was compiled by the Office of Sustainability at USM.

*Some construction vehicles were observed in June due to construction around the Brighton/Deering intersection; these have been included in the counts, assuming that the spots they were taking could have been otherwise occupied.

*Some blocks were closed to non-local traffic in June due to roundabout construction, thus limiting parking; however, occupancy here was retained in the analysis since it likely skews the University impact number higher (to be conservative) and excluding it would underrepresent the University's impact.

*The average occupancy difference columns were created by subtracting the June data from the October data, creating a difference that is assumed to be the parking burden on the community by University-affiliated vehicles.

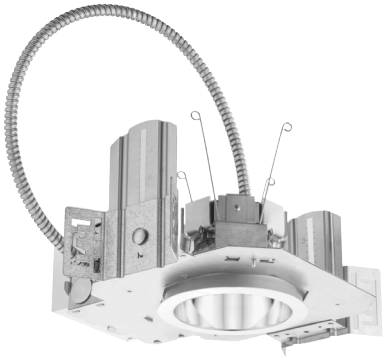
* Brighton Ave and Bedford St were left in the analysis even though those parking spaces will be lost due to the roundabout project. Leaving them in allows for the University's impact on space counts to be reflected, while avoiding an arbitration inflation of the University's impact due to the roundabout project if their space counts were excluded from one or both data sets.

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

LDN4

4" OPEN
Non-IC
New Construction Downlight



FEATURES & SPECIFICATIONS

INTENDED USE — Typical applications include corridors, lobbies, conference rooms and private offices.

CONSTRUCTION — Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches. Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination 1/2"-3/4" and four 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C standard; high ambient (40°C) option available. Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

OPTICS — LEDs are binned to a 3-step SDCM; 80 CRI minimum. 90 CRI optional.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in specular, semi-specular, or matte diffuse finishes. Also available in white and black painted reflectors.

ELECTRICAL — Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% or 1% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 60,000 hours.

LISTINGS — Certified to US and Canadian safety standards. Wet location standard (covered ceiling). IP55 rated. ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

battery pack

A+ Capable options indicated by this color background.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LDN4 35/15 LO4AR LSS MVOLT EZ1

LDN4													
Series		**Color temperature**		**Lumens**[1]		**Aperture/Trim Color**				**Finish**		**Voltage**	
LDN4	4" round	27/	2700K	05	500 lumens	LO4	Downlight	AR	Clear	LSS	Semi-specular	MVOLT	Multi-volt
		30/	3000K	07	750 lumens	LW4	Wallwash	WR[2]	White	LD	Matte diffuse	120	120V
		35/	3500K	10	1000 lumens			BR[2]	Black	LS	Specular	277	277V
		40/	4000K	15	1500 lumens							347[3]	347V
		50/	5000K	20	2000 lumens								
				25	2500 lumens								
				30	3000 lumens								
				40	4000 lumens								

Driver		**Options**			
GZ10	0-10V driver dims to 10%	SF[4]	Single fuse	N80[8]	nLight™ Lumen Compensation
GZ1	0-10V driver dims to 1%	TRW[6]	White painted flange	NPS80EZ[7,10]	nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1).
EZ10	0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 10%	TRBL[6]	Black painted flange	NPS80EZER[7,10]	nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1). ER controls fixtures on emergency circuit.
EZ1	0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 1%	EL[5]	Emergency battery pack with integral test switch. 10W Constant Power, Not Certified in CA Title 20 MAEDBS	HAO[11]	High ambient option (40°C)
		ELR[5]	Emergency battery pack with remote test switch. 10W Constant Power, Not Certified in CA Title 20 MAEDBS	CP[12]	Chicago Plenum
		ELSD[5]	Emergency battery pack with self-diagnostics, 10W Constant Power, integral test switch. Not Certified in CA Title 20 MAEDBS	RRL__	RELOC®-ready luminaire connectors enable a simple and consistent factory installed option across all ABL luminaire brands. Refer to RRL for complete nomenclature. Available only in RRLA, RRLB, RRLAE, and RRLC12S.
		ELRSD[5]	Emergency battery pack with self-diagnostics, 10W Constant Power, remote test switch. Not Certified in CA Title 20 MAEDBS	NLTAIR2[8,9]	nLight® Air enabled
		E10WCP[5]	Emergency battery pack, 10W Constant Power with integral test switch. Certified in CA Title 20 MAEDBS	NLTAIRER2[9,10]	nLight® AIR Dimming Pack Wireless Controls. Controls fixtures on emergency circuit, not available with battery pack options
		E10WCPR[5]	Emergency battery pack, 10W Constant Power with remote test switch. Certified in CA Title 20 MAEDBS	USPOM	US point of manufacture
		NPP16D[7,10]	nLight® network power/relay pack with 0-10V dimming for non-eldoLED drivers (GZ10, GZ1).	90CRI	High CRI (90+)
		NPP16DER[7,10]	nLight® network power/relay pack with 0-10V dimming for non-eldoLED drivers (GZ10, GZ1). ER controls fixtures on emergency circuit.		

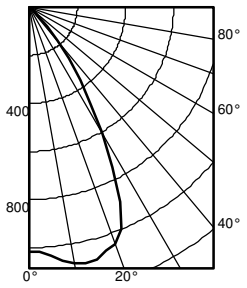
Notes

1 Overall height varies based on lumen package; refer to dimensional chart on page 3.
2 Not available with finishes.
3 Not available with emergency options.
4 Must specify voltage 120V or 277V.
5 12.5" of plenum depth or top access required for battery pack maintenance.
6 Available with clear (AR) reflector only.
7 Specify voltage. ER for use with generator supply EM power. Will require an emergency hot feed and normal hot feed.
8 Fixture begins at 80% light level. Must be specified with NPS80EZ or NPS80EZ ER. Only available with EZ10 and EZ1 drivers.
9 Not available with CP, NPS80EZ, NPS80EZER, NPP16D, NPP16DER or N80 options.
10 NLTAIR2 and NLTAIRER2 not recommended for metal ceiling installations.
11 Fixture height is 5-11/16" for all lumen packages with HAO.
12 Must specify voltage for 3000lm. Not available with emergency battery pack option.

PHOTOMETRY

Distribution Curve | **Distribution Data** | **Output Data** | **Coefficient of Utilization** | **Illuminance Data at 30" Above Floor for a Single Luminaire**

LDN4 35/10 LO4AR, input watts: 10.58, delivered lumens: 1085.2, LM/W = 102.57, spacing criterion at 0= 1.04, test no. ISF 30712P229.



	Ave	Lumens
0	1017	
5	1039	101
15	1084	304
25	895	395
35	369	232
45	52	51
55	1	2
65	1	1
75	0	0
85	0	0
90	0	

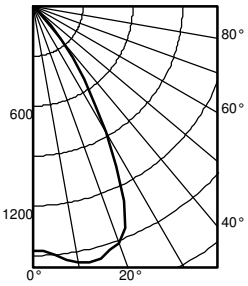
Zone	Lumens	% Lamp
0° - 30°	799.7	73.7
0° - 40°	1031.5	95.1
0° - 60°	1084.7	100.0
0° - 90°	1085.2	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	1085.2	*100.0

*Efficiency

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	33.6	5.8	16.8	8.9	3.4
10.0	18.1	7.9	9.0	12.2	1.8
12.0	11.3	10.0	5.6	15.4	1.1
14.0	7.7	12.1	3.8	18.6	0.8
16.0	5.6	14.2	2.8	21.9	0.6

LDN4 35/15 LO4AR, input watts: 17.5, delivered lumens: 1570.1, LM/W = 89.72, spacing criterion at 0= 1.04, test no. ISF 30712P234.



	Ave	Lumens
0	1472	
5	1503	146
15	1569	440
25	1295	571
35	534	335
45	75	74
55	1	3
65	1	1
75	0	0
85	0	0
90	0	

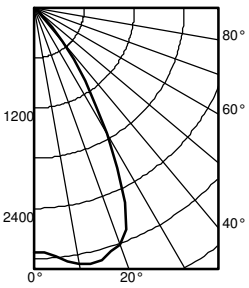
Zone	Lumens	% Lamp
0° - 30°	1157.1	73.7
0° - 40°	1492.5	95.1
0° - 60°	1569.4	100.0
0° - 90°	1570.1	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	1570.1	*100.0

*Efficiency

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	48.7	5.8	24.3	8.9	4.9
10.0	26.2	7.9	13.1	12.2	2.6
12.0	16.3	10.0	8.2	15.4	1.6
14.0	11.1	12.1	5.6	18.6	1.1
16.0	8.1	14.2	4.0	21.9	0.8

LDN4 35/30 LO4AR, input watts: 32.1, delivered lumens: 3122.6, LM/W = 88.52, spacing criterion at 0= 1.04, test no. ISF 30712P249.



	Ave	Lumens
0	2927	
5	2989	290
15	3120	875
25	2575	1136
35	1062	667
45	149	148
55	3	5
65	2	1
75	0	0
85	0	0
90	0	

Zone	Lumens	% Lamp
0° - 30°	2301.2	73.7
0° - 40°	2968.2	95.1
0° - 60°	3121.1	100.0
0° - 90°	3122.6	100.0
90° - 120°	0.0	0.0
90° - 130°	0.0	0.0
90° - 150°	0.0	0.0
90° - 180°	0.0	0.0
0° - 180°	3122.6	*100.0

*Efficiency

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	119	119	119	116	116	116	111	111	111
1	111	108	106	109	107	105	105	103	101
2	103	99	96	102	98	95	98	95	93
3	96	92	88	95	91	87	92	89	86
4	90	85	81	89	84	80	87	83	79
5	85	79	75	84	78	74	82	77	74
6	79	73	69	79	73	69	77	72	68
7	75	69	64	74	68	64	73	68	64
8	70	64	60	70	64	60	69	63	60
9	66	60	56	66	60	56	65	60	56
10	63	57	53	62	57	53	61	56	53

		50% beam - 55.6°		10% beam - 78.0°	
Mounting Height	Inital FC Center Beam	Diameter	FC	Diameter	FC
8.0	96.8	5.8	48.4	8.9	9.7
10.0	52.0	7.9	26.0	12.2	5.2
12.0	32.4	10.0	16.2	15.4	3.2
14.0	22.1	12.1	11.1	18.6	2.2
16.0	16.1	14.2	8.0	21.9	1.6

Accessories: *Order as separate catalog numbers (shipped separately).*

SCA4	Sloped ceiling adapter. Degree of slope must be specified (5D, 10D, 15D, 20D, 25D, 30D). Refer to TECH-190.

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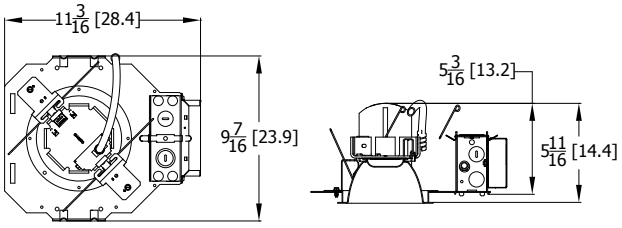
LDN4

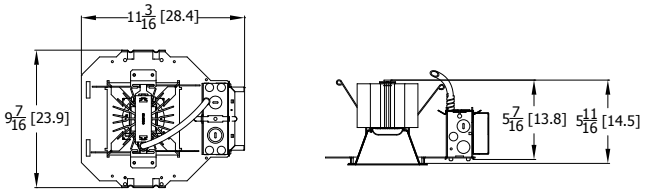
* All dimensions are inches (centimeters) unless otherwise noted.

LDN4 500-1500 LUMEN



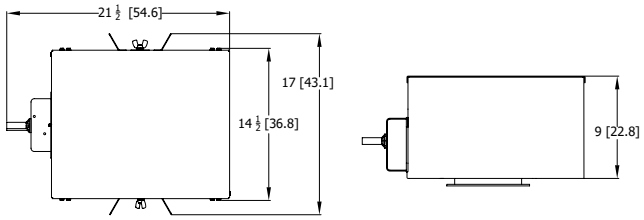
Aperture: 4-5/16 (11)
Ceiling Opening: 5-1/8 (13)
Overlap trim: 5-7/16 (13.8)

LDN4 2000-3000 LUMEN



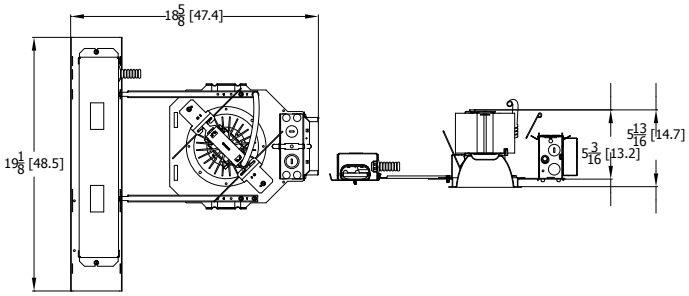
Aperture: 4-5/16 (11) Square
Ceiling Opening: 5-1/8 (13) Square
Overlap trim: 5-7/16 (13.8) Square

LDN4 CP



Aperture: 4-5/16? (11)
Ceiling Opening: 5-1/8? (13)
Overlap trim: 5-7/16? (13.8)

LDN4 EL-ELR



Aperture: 4-5/16 (11)
Ceiling Opening: 5-1/8 (13)
Overlap trim: 5-7/16 (13.8)

LDN4			
Nominal	**Lumens**	**Wattage**	**Lm/W**
500	523.6	5.74	91.2
750	751.1	8.6	87.3
1000	1045	10.58	98.8
1500	1512	17.5	86.4
2000	2006	22.12	90.7
2500	2551	26.1	97.7
3000	3007	32.1	93.7
4000	4212	43	98.0

LUMEN OUTPUT MULTIPLIERS - CCT					
	2700K	**3000K**	**3500K**	**4000K**	**5000K**
80CRI	0.950	0.966	1.000	1.025	1.101

HOW TO ESTIMATE DELIVERED LUMENS IN EMERGENCY MODE

Use the formula below to estimate the delivered lumens in emergency mode

Delivered Lumens = 1.25 x P x LPW

P = Ouput power of emergency driver. P = 10W for PS1055CP

LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet.
The LPW rating is also available at Designlight Consortium.

LUMEN OUTPUT MULTIPLIERS - FINISH			
	Clear (AR)	**White (WR)**	**Black (BR)**
Specular (LS)	1.0	N/A	N/A
Semi-specular (LSS)	0.950	N/A	N/A
Matte diffuse (LD)	0.85	N/A	N/A
Painted	N/A	0.87	0.73

Notes

- Tested in accordance with IESNA LM-79-08.
- Tested to current IES and NEMA standards under stabilized laboratory conditions.
- CRI: 80 typical.

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ADDITIONAL DATA

COMPATIBLE 0-10V WALL-MOUNT DIMMERS		
MANUFACTURER	PART NO.	POWER BOOSTER AVAILABLE
Lutron®	Diva® DVTV	
	Diva® DVSCTV	
	Nova T® NTFTV	
	Nova® NFTV	
Leviton®	AWSMT-7DW	CN100
	AWSMG-7DW	PE300
	AMRMG-7DW	
	Leviton Centura Fluorescent Control System	
	IllumaTech® IP7 Series	
Synergy®	ISD BC	RDMFC
	SLD LPCS	
	Digital Equinox (DEQ BC)	
Douglas Lighting Controls	WPC-5721	
Entertainment Technology	Tap Glide TG600FAM120 (120V)	
	Tap Glide Heatsink TGH1500FAM120 (120V)	
	Oasis 0A2000FAMU	
Honeywell	EL7315A1019	EL7305A1010 (optional)
	EL7315A1009	
HUNT Dimming	Preset slide: PS-010-IV and PS-010-WH	
	Preset slide: PS-010-3W-IV and PS-010-3W-WH	
	Preset slide, controls FD-010: PS-IFC-010-IV and PS-IFC-010-WH-120/277V	
	Preset slide, controls FD-010: PS-IFC-010-3W-IV and PS-IFC-010-3W-WH-120/277V	
	Remote mounted unit: FD-010	
Lehigh Electronic Products	Solitaire	PBX
PDM Electrical Products	WPC-5721	
Starfield Controls	TR61 with DALI interface port	RT03 DALInet Router
WattStopper®	LS-4 used with LCD-101 and LCD-103	

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a shaded background*
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

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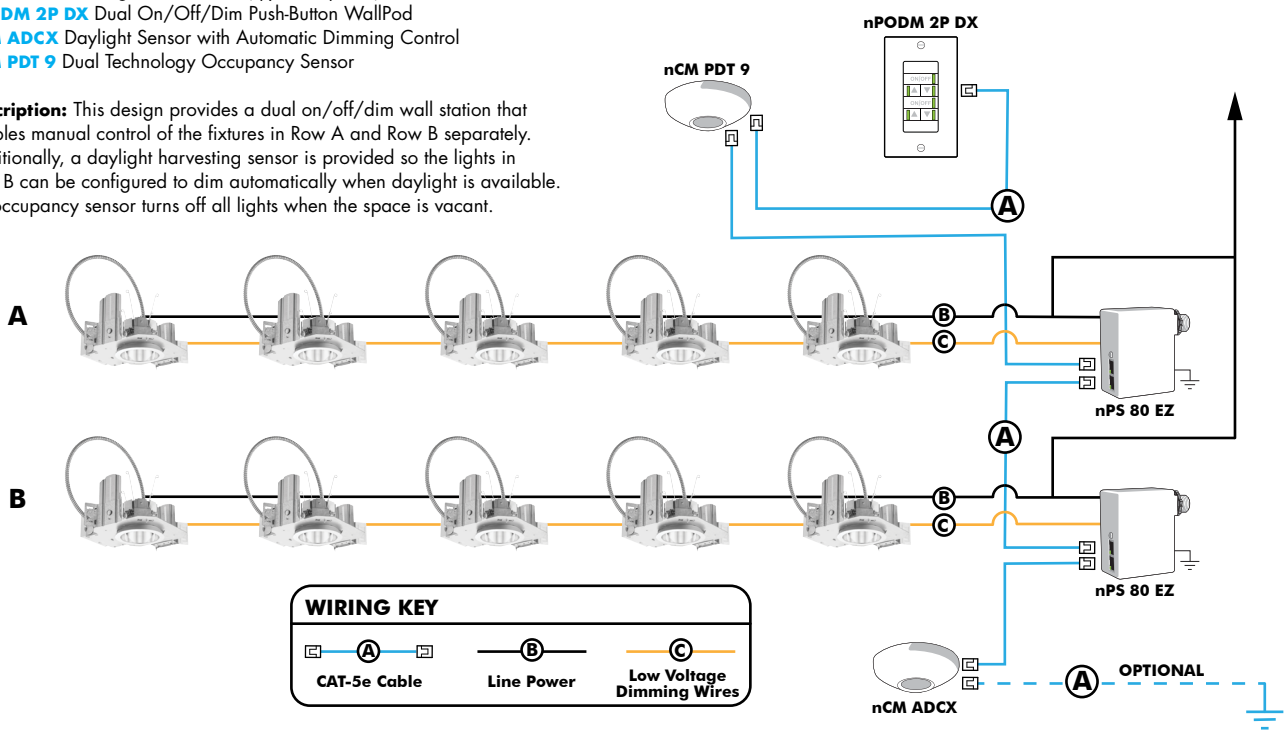
EXAMPLE
Group Fixture Control*
*Appiication diagram applies for fixtures with eldoLED drivers only.

nPS 80 EZ Dimming/Control Pack (qty: 2 required)
nPODM 2P DX Dual On/Off/Dim Push-Button WallPod
nCM ADCX Daylight Sensor with Automatic Dimming Control
nCM PDT 9 Dual Technology Occupancy Sensor

Description: This design provides a dual on/off/dim wall station that enables manual control of the fixtures in Row A and Row B separately. Additionally, a daylight harvesting sensor is provided so the lights in Row B can be configured to dim automatically when daylight is available. An occupancy sensor turns off all lights when the space is vacant.



Choose Wall Controls
nLight offers multiple styles of wall controls - each with varying features and user experience.



Push-Button Wallpod
Traditional tactile buttons and LED user feedback



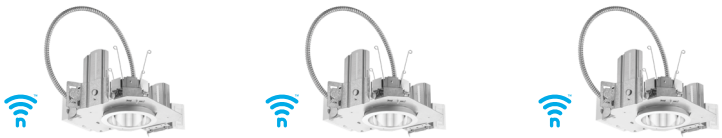
Graphic Wallpod
Full color touch screen provides a sophisticated look and feel

nLight® Wired Controls Accessories:			
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight for complete listing of nLight controls.			
WallPod Stations	**Model number**	**Occupancy sensors**	**Model Number**
On/Off	nPODM (Color)	Small motion 360º, ceiling (PIR/dual Tech)	nCM 9 / nCM PDT 9
On/Off & Raise/Lower	nPOD DX (Color)	Large motion 360º, ceiling (PIR/dual tech)	nCM 10 / nCM PDT 10
Graphic Touchscreen	nPOD GFX (Color)	Wide View (PIR/dual tech)	nWV 16 / nWV PDT 16
Photocell controls	**Model Number**	Wall Switch w/ Raise/Lower (PIR/dual tech)	nWSX LV DX / nWSX PDT LV DX
Dimming	nCM ADCX	**Cat-5 cables (plenum rated)**	**Model Number**
		10', CAT5 10FT	CAT5 10FT J1
		15, CAT5 15FT	CAT5 15FT J1

nLight® AIR Control Accessories: *Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair.*	
Wall switches	**Model number**
On/Off single pole	rPODB [color]
On/Off two pole	rPODB 2P [color]
On/Off & raise/lower single pole	rPODB DX [color]
On/Off & raise/lower two pole	rPODB 2P DX [color]
On/Off & raise/lower single pole	rPODBZ DX WH[1]

Notes
1 Can only be ordered with the RES7Z zone control sensor version.

nLight AIR
nLight AIR is the ideal solution for retrofit or new construction spaces where adding communication is cost prohibitive. The integrated nLight AIR rPP20 Power Pack is part of each Lithonia LDN Luminaire. These individually addressable controls offer the ultimate in flexibility during initial setup and for space repurposing.



Simple as 1,2,3

1. Install the nLight® AIR fixtures with embedded smart sensor
2. Install the wireless battery-powered wall switch
3. With CLAIRITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome



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JOB _____ TYPE _____

NOTES _____ APPROVALS _____

FEATURES

- 20" size in post top, pole and wall mount
- High performance optics up to 17,000 delivered lumens
- Elegant form factor
- Diffusion lens option
- SiteSync™ wireless control options

CERTIFICATIONS

c UL us LISTED

ida DARK SKY APPROVED 2016

DLC OPEL LISTED

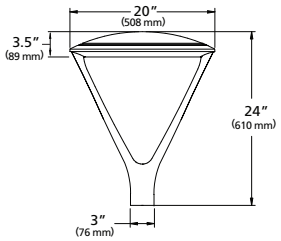
3000K and warmer CCTs only

SPECIFICATIONS



Weight: 35 lbs

FM33



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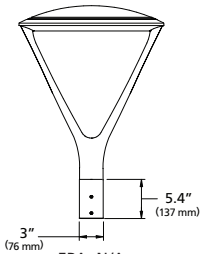
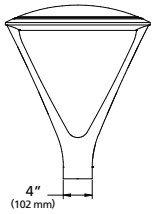
PT23



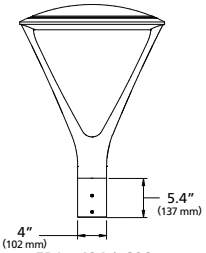
EPA: N/A

FM44



EPA: .534

PT24 / PT34



EPA: .424 / .608

ORDERING CODE

Series	LED Engine	CCT	Distribution	Rotation	Voltage	Mounting
UR20 Ouro	No Lens or Clear Lens	**AM** Amber	No Lens or Clear Lens	Blank for no rotation	**UNV** 120-277V	**FM33** Flush mt 3.0" OD pole, 3" fixture base
	24L-25 3,000 lm	**3K7** 3000K, 70 CRI	**FR** Type 1/Front Row	**L**[1] Optic rotation left	**347** 347V	**FM44** Flush mt 3.6" to 4.0" OD pole, 4" fixture base
	24L-65 7,000 lm	**3K8** 3000K, 80 CRI	**2** Type II	**R**[1] Optic rotation right	**480** 480V	**PT23** 3" Post Top mount for 2 3/8" OD Tenon
	56L-75 10,000 lm	**3K9** 3000K, 90 CRI	**3** Type III		**DALI** 120-277V†	**PT24** 4" Post Top mount for 2 3/8" OD Tenon
	56L-110 15,000 lm	**4K7** 4000K, 70 CRI	**4** Type IV		†Consult factory	**PT34** 4" Post Top mount for 2 7/8" OD Tenon
	56L-140 17,000 lm	**4K8** 4000K, 80 CRI	**4W** Type IV Wide			
	HDL - High Diffusion Lens	**5K7** 5000K, 70 CRI	**5QM** Type V Square Medium			
	28L-30 3,000 lm		**5QN** Type V Square Narrow			
	28L-70 7,000 lm		**5R** Type V Rectangular			
	68L-80 9,000 lm		**5W** Type V Wide (Round)			
	68L-115 13,000 lm		HDL - High Diffusion Lens			
	68L-150 15,000 lm		**3** Type III/Asymmetric			
			5W Type V/Symmetric			

Fixture Finish	Control Options		Options	Control Accessories^
BL Black	**7PR-TL** 7 pin PCR with twist lock photocontrol	**SWPM-40F**[2,3,4,5] SiteSync with Sensor 9' to 40' MH	**BC**[6] Back-light Control	**SW7PR**[2,3] SiteSync with 7 pin PCR
DB Dark Bronze	**7PR-SC** 7 pin PCR with shorting cap	**WSP-40F-1**[2,5] Dimming Occ. Sensor for up to 40' MH, 120/277/347V	**SF** Single Fuse	**SWUSB** SiteSync Software on USB
LG Light Gray	**7PR** 7 pin PCR, wireless control enabled	**WSP-40F-2**[2,5] Dimming Occ. Sensor for up to 40' MH, 208/240V	**DF** Double Fuse	**SWTAB** SiteSync Windows® Tablet
GT Graphite	**AD-01**[2] AstroDIM: 50% output at midnight	**WSP-40F-3**[2,5] Dimming Occ. Sensor for up to 40' MH, 480V	**TB** Terminal Block	**SWBRG** SiteSync Wireless Bridge Node
PS Platinum Silver	**AD-02**[2] AstroDIM: 50% output midnight to 4 AM	**NXSPW14F**[2,5] NX Wireless, PIR Sensor, 14'	**CLR**[5] Clear Lens	**WIR-RME-L** wiSCAPE External Fixture Module
TT Titanium	**AD-03**[2] AstroDIM: 50% output 10PM	**NXSPW30F**[2,5] NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'.	**TL** Tamper proof latch	**SCL-R** Occ. Sensor for Round Pole (up to 16' MH)
WH White	**AD-04**[2] AstroDIM: 50% output 10PM to 4AM	**NXSP14F**[2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14'		**SCL -S** Occ. Sensor for Square Pole (up to 16' MH)
CC Custom Color†	**NXWE** NX Wireless Enabled	**NXSP30F**[2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'		**SCH-R** Occ. Sensor for Round Pole (16' to 30' MH)
†Consult factory	**SWP**[2,3,4] SiteSync Pre commission			**SCH-S** Occ. Sensor for Square Pole (16' to 30' MH)
				NXOFM-1R1D-UNV NX 7-pin Module
				^ Please refer to page 8 for ordering details

1 Not available with 5QM, 5QN, and 5W distributions.
2 Not available with other sensor or wireless control options.
3 Specify group and zone at time of order. See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node.
4 Not available with 347V and 480V
5 24L & 56L only.
6 Not available with Type V distributions or HDL option.

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
24L	3,000	25	No Lens	FR	2932	0	0	1	115	3119	0	0	1	123	3098	0	0	1	124
				FR-BC	1994	0	0	0	78	2121	0	0	0	83	2107	0	0	0	83
				2	2943	1	0	1	116	3099	1	0	1	122	3110	1	0	1	124
				2-BC	1724	0	0	1	68	1834	0	0	1	72	1822	0	0	1	72
				3	3007	1	0	1	118	3200	1	0	1	126	3178	1	0	1	127
				3-BC	1830	0	0	1	73	1947	0	0	1	78	1934	0	0	1	77
				4	3056	0	0	1	120	3251	0	0	1	128	3229	0	0	1	129
				4-BC	2235	0	0	1	88	2377	0	0	1	93	2362	0	0	1	93
				4W	3078	1	0	2	121	3276	1	0	2	129	3253	1	0	2	130
				4W-BC	1855	0	0	1	73	1975	0	0	1	78	1961	0	0	1	77
				5QM	2931	2	0	1	115	3119	2	0	1	123	3098	2	0	1	124
				5QN	2694	2	0	1	106	2866	2	0	1	113	2847	2	0	1	114
				5R	3054	2	0	2	120	3250	2	0	2	128	3228	2	0	2	129
				5W	3043	2	0	1	120	3237	2	0	1	127	3216	2	0	1	129
			Clear Lens	FR	2773	0	0	1	109	2951	0	0	1	116	2930	0	0	1	117
				FR-BC	1886	0	0	1	74	2007	0	0	1	79	1993	0	0	1	78
				2	2784	1	0	1	109	2963	1	0	1	116	2942	1	0	1	118
				2-BC	1631	0	0	1	64	1736	0	0	1	68	1723	0	0	1	67
				3	2845	1	0	1	111	3028	1	0	1	119	3007	1	0	1	120
				3BC	1806	0	0	1	72	1922	0	0	1	77	1909	0	0	1	76
				4	2891	0	0	1	113	3076	0	0	1	120	3055	0	0	1	122
				4-BC	2114	0	0	1	83	2250	0	0	1	88	2234	0	0	1	88
				4W	2912	1	0	1	114	3099	1	0	2	121	3077	1	0	2	123
				4W-BC	1755	0	0	1	69	1868	0	0	1	73	1855	0	0	1	5
				5QM	2773	1	0	1	109	2950	2	0	1	116	2931	2	0	1	117
				5QN	2549	1	0	0	100	2712	2	0	1	106	2693	2	0	1	108
				5R	2890	2	0	2	113	3075	2	0	2	120	3054	2	0	2	122
				5W	2879	2	0	1	113	3064	2	0	1	120	3042	2	0	1	122
28L		30	HDL Lens	3	2816	1	0	1	96	2997	1	0	1	102	3020	1	0	1	101
				5W	2917	1	0	1	100	3105	1	0	1	106	3084	1	0	1	103

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
24L	7,000	65	No Lens	FR	6754	1	0	1	104	7187	1	0	1	111	7138	1	0	1	110
				FR-BC	4392	0	0	1	68	4673	0	0	1	72	4641	0	0	1	71
				2	6571	1	0	2	101	6992	1	0	2	108	6944	1	0	2	107
				2-BC	3799	0	0	1	58	4042	0	0	1	62	4014	0	0	1	62
				3	6625	1	0	2	102	7051	1	0	2	108	7002	1	0	2	108
				3BC	4032	0	0	1	62	4291	0	0	1	66	4261	0	0	1	66
				4	6788	1	0	2	104	7223	1	0	2	111	7174	1	0	2	110
				4-BC	4924	0	0	2	76	5239	0	0	2	81	5203	0	0	2	80
				4W	6699	1	0	2	103	7128	1	0	3	110	7079	1	0	3	109
				4W-BC	4088	0	0	2	63	4350	0	0	2	67	4321	0	0	2	66
				5QM	7025	3	0	1	108	7477	3	0	1	115	7425	3	0	1	114
				5QN	6964	3	0	1	107	7410	3	0	1	114	7323	3	0	1	113
				5R	7038	3	0	3	108	7489	3	0	3	115	7437	3	0	3	114
				5W	7011	3	0	2	108	7460	3	0	2	115	7409	3	0	2	114
			Clear Lens	FR	6432	1	0	1	97	6844	1	0	1	104	6798	1	0	1	105
				FR-BC	4182	0	0	1	63	4450	0	0	1	67	4420	0	0	1	67
				2	6258	1	0	1	95	6659	1	0	2	101	6613	1	0	2	102
				2-BC	3617	0	0	1	55	3849	0	0	1	58	3823	0	0	1	58
				3	6310	1	0	2	96	6714	1	0	2	102	6668	1	0	2	103
				3-BC	3599	0	0	1	55	3829	0	0	1	59	3803	0	0	1	59
				4	6465	1	0	2	98	6879	1	0	2	104	6832	1	0	2	105
				4-BC	4688	0	0	2	71	4990	0	0	2	76	4955	0	0	2	75
				4W	6380	1	0	2	97	6789	1	0	2	103	6742	1	0	2	104
				4W-BC	3893	0	0	2	59	4143	0	0	2	63	4115	0	0	2	62
				5QM	6691	3	0	1	101	7119	3	0	1	108	7070	3	0	1	109
				5QN	6632	2	0	1	100	7058	3	0	1	107	7009	3	0	1	108
				5R	6702	3	0	3	102	7131	3	0	3	108	7082	3	0	3	109
				5W	6676	3	0	2	101	7104	3	0	2	108	7055	3	0	2	109
28L		70	HDL Lens	3	6047	2	0	2	92	6047	2	0	2	92	6236	2	0	2	89
				5W	6221	2	0	1	94	6619	2	0	1	100	6525	2	0	1	93

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	10,000	75	No Lens	FR	9315	1	0	1	124	9913	1	0	1	132	9845	1	0	1	131
				FR-BC	6058	0	0	1	81	6445	0	0	1	86	6402	0	0	1	85
				2	9063	2	0	2	120	9644	2	0	2	128	9578	2	0	2	128
				2-BC	5239	0	0	1	70	5575	0	0	1	74	5536	0	0	1	74
				3	9139	2	0	2	125	9725	2	0	2	134	9657	2	0	2	129
				3-BC	5561	0	0	2	74	5877	0	0	2	78	5561	0	0	2	74
				4	9362	1	0	2	124	9362	1	0	2	124	9876	1	0	2	132
				4-BC	6791	0	0	2	90	7226	0	0	2	96	7168	0	0	2	96
				4W	9240	2	0	3	123	9832	2	0	3	131	9765	2	0	3	130
				4W-BC	5639	0	0	2	75	6001	0	0	2	80	5959	0	0	2	79
				5QM	9691	3	0	1	129	10312	3	0	1	137	10240	3	0	1	137
				5QN	9606	3	0	1	128	10222	3	0	1	136	10151	3	0	1	135
				5R	9706	3	0	3	129	10328	3	0	3	137	10258	3	0	3	137
				5W	9669	4	0	2	129	10289	4	0	2	137	10217	4	0	2	136
			Clear Lens	FR	8871	1	0	1	117	9760	1	0	1	129	9374	1	0	1	125
				FR-BC	5769	0	0	1	76	6138	0	0	1	81	6096	0	0	1	81
				2	8631	2	0	2	114	9183	2	0	2	121	9121	2	0	2	122
				2-BC	4989	0	0	1	67	5309	0	0	1	71	5272	0	0	1	62
				3	8703	1	0	2	115	9260	2	0	2	122	9197	2	0	2	123
				3-BC	4964	1	0	1	66	5282	1	0	2	70	5245	1	0	2	69
				4	8916	1	0	2	118	9487	1	0	2	125	9423	1	0	2	126
				4-BC	6467	0	0	2	85	6881	0	0	2	91	6834	0	0	2	90
				4W	8799	2	0	3	116	9363	2	0	3	124	9300	2	0	3	124
				4W-BC	5370	0	0	2	72	5714	1	0	2	76	5675	0	0	2	76
				5QM	9228	3	0	1	122	9820	3	0	1	130	9752	3	0	1	130
				5QN	9147	3	0	1	121	9734	3	0	1	129	9668	3	0	1	129
				5R	9244	3	0	3	122	9836	3	0	3	130	9769	3	0	3	130
				5W	9208	4	0	2	122	9798	4	0	2	130	9732	4	0	2	130
68L		80	HD Lens	3	7853	2	0	2	99	8356	2	0	2	106	8299	2	0	2	104
				5W	8080	2	0	2	102	8684	3	0	2	110	8684	3	0	2	109

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	15,000	110	No Lens	FR	13533	1	0	1	125	14399	1	0	2	133	14301	1	0	2	130
				FR-BC	8799	1	0	1	81	9363	1	0	1	86	9300	1	0	1	85
				2	13165	2	0	2	121	14009	2	0	2	129	13913	2	0	2	126
				2-BC	7611	1	0	2	70	8098	1	0	2	75	8042	1	0	2	74
				3	13275	2	0	3	122	14126	2	0	3	130	14030	2	0	3	128
				3-BC	8079	1	0	2	73	8596	1	0	2	78	8538	1	0	2	78
				4	13601	1	0	3	125	14472	1	0	3	133	14373	1	0	3	131
				4-BC	9865	1	0	2	91	10497	1	0	3	97	10425	1	0	3	96
				4W	13422	2	0	3	124	14283	2	0	3	132	14185	2	0	3	129
				4W-BC	8191	1	0	3	75	8715	1	0	3	80	8656	1	0	3	80
				5QM	14077	4	0	2	130	14979	4	0	2	138	14876	4	0	2	135
				5QN	13953	4	0	1	129	14848	4	0	1	137	14747	4	0	1	134
				5R	14100	4	0	4	130	15004	4	0	4	138	14901	4	0	4	135
				5W	14046	4	0	2	129	14946	4	0	2	138	14844	4	0	3	135
			Clear Lens	FR	12803	1	0	1	118	13624	1	0	1	126	13531	1	0	1	123
				FR-BC	9298	1	0	1	86	8325	1	0	1	77	8798	1	0	1	81
				2	12455	2	0	2	115	13254	2	0	2	123	13164	2	0	2	120
				2-BC	7200	1	0	1	67	7661	1	0	2	71	7610	1	0	2	70
				3	12560	2	0	3	116	13365	2	0	3	124	13273	2	0	3	121
				3-BC	7163	1	0	2	65	7622	1	0	2	69	7570	1	0	2	69
				4	12868	1	0	3	119	13692	1	0	3	127	13599	1	0	3	124
				4-BC	9333	1	0	2	86	9931	1	0	2	92	9864	1	0	2	90
				4W	12699	2	0	3	117	13513	2	0	3	125	13420	2	0	3	122
				4W-BC	7750	1	0	3	72	8246	1	0	3	76	8190	1	0	3	76
				5QM	13318	3	0	2	123	14172	4	0	2	131	14075	4	0	2	128
				5QN	13202	3	0	1	122	14048	4	0	1	130	13951	4	0	1	127
				5R	13341	4	0	4	123	14195	4	0	4	131	14099	4	0	4	128
				5W	13290	4	0	2	123	14141	4	0	2	131	14044	4	0	2	128
68L		115	HD Lens	3	11577	2	0	2	102	12320	2	0	2	109	12236	2	0	2	106
				5W	11912	3	0	2	105	12676	3	0	2	112	12588	3	0	2	109

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LED #	Nominal Lumen Package	Nominal Published Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
56L	17,000	140	No Lens	FR	15323	2	0	2	111	16306	2	0	2	118	16194	2	0	2	116
				FR-BC	9964	1	0	1	72	10603	1	0	1	77	10530	1	0	1	76
				2	14897	2	0	2	108	15852	2	0	2	115	15743	2	0	2	112
				2-BC	8618	1	0	2	63	9169	1	0	2	67	9107	1	0	2	66
				3	15032	2	0	3	109	15996	2	0	3	116	15886	2	0	3	113
				3-BC	9147	1	0	2	65	9733	1	0	2	70	9667	1	0	2	69
				4	15400	1	0	3	112	16387	1	0	4	119	16275	1	0	4	116
				4-BC	11170	1	0	3	81	11886	1	0	3	86	11804	1	0	3	86
				4W	15198	2	0	4	110	16173	3	0	4	117	16062	3	0	4	115
				4W-BC	9275	1	0	3	67	9869	1	0	3	72	9801	1	0	3	71
				5QM	15939	4	0	2	116	16962	4	0	2	123	16845	4	0	2	120
				5QN	15801	4	0	1	115	16813	4	0	1	122	16698	4	0	1	119
				5R	15966	4	0	4	116	16990	4	0	4	123	16874	4	0	4	121
				5W	15906	4	0	3	115	16925	4	0	3	123	16808	4	0	3	120
			Clear Lens	FR	14541	1	0	2	105	15473	2	0	2	111	15367	2	0	2	110
				FR-BC	9456	1	0	1	68	10061	1	0	1	72	9993	1	0	1	72
				2	14146	2	0	2	102	15053	2	0	2	108	14950	2	0	2	107
				2-BC	8178	1	0	2	59	8702	1	0	2	63	8642	1	0	2	62
				3	14265	2	0	3	103	15179	2	0	3	109	15076	2	0	3	108
				3BC	8136	1	0	2	58	8657	1	0	2	62	8598	1	0	2	61
				4	14614	1	0	3	105	15551	1	0	3	112	15445	1	0	3	110
				4-BC	10600	1	0	3	76	11279	1	0	3	81	11203	1	0	3	81
				4W	14423	2	0	3	104	15347	2	0	4	111	15243	2	0	4	109
				4W-BC	8802	1	0	3	63	9365	1	0	3	67	9302	1	0	3	67
				5QM	15126	4	0	2	109	16095	4	0	2	116	15985	4	0	2	114
				5QN	14994	4	0	1	108	15955	4	0	1	115	15846	4	0	1	113
				5R	15152	4	0	4	109	16122	4	0	4	116	16012	4	0	4	114
				5W	15094	4	0	3	109	16061	4	0	3	116	15951	4	0	3	114
68L		115	HD Lens	3	13240	2	0	2	89	13992	3	0	3	95	13897	3	0	3	93
				5W	13623	3	0	2	92	14396	3	0	2	97	14298	3	0	2	95

Electrical Characteristics												Dimming				
System Watts	Drive Current	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming Range	Source current out		Absolute voltage	
		VAC	Hz	120	208	240	277	347	480				Min	Max	Min	Max
25	298mA	120-480	50/60	0.21	0.12	0.10	0.09	0.07	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
30	298mA			0.25	0.14	0.13	0.11	0.09	0.06							
65	800mA			0.54	0.31	0.27	0.23	0.19	0.14							
70	700mA			0.58	0.34	0.29	0.25	0.20	0.15							
75	420mA			0.63	0.36	0.31	0.27	0.22	0.16							
80	350mA			0.67	0.38	0.33	0.29	0.23	0.17							
110	600mA			0.92	0.53	0.46	0.40	0.32	0.23							
115	500mA			0.96	0.55	0.48	0.42	0.33	0.24							
140	750mA			1.17	0.67	0.58	0.51	0.40	0.29							
150	625mA			1.25	0.72	0.63	0.54	0.43	0.31							

TM-21 LIFETIME CALCULATION

Projected Lumen Maintenance (25°C / 77°F)						
HOURS	0	25,000	36,000	50,000	100,000	Reported L70
Projected Lumen Maintenance	100%	97%	95%	93%	87%	> 60,000 hrs

Kim Lighting reserves the right to change specifications without notice.

SPECIFICATIONS

Housing:

- Low copper aluminum alloy die-casting is designed as one-piece with internal cooling fins.
- Solid, cast aluminum wall creates a thermal barrier between the optical and electrical compartments.
- Molded silicone gasket throughout insures the sealing between the two compartments and provides ingress protection.
- Housing is designed with integral LED heat sink utilized for thermal transfer and for securing the location of each LED module.
- IK09 rated enclosure protects electrical equipment against external mechanical impacts.

Lens Frame:

- One-piece low copper aluminum alloy die-cast is secured to housing with 6 screws.

Backlight Control

- Optional Backlight Control on each LED module to completely control unwanted backlight.

Lens

One-piece flat glass lens slips secure with clips. Extra silicone gasketing is provided to retain a clear optical compartment.

Optical Module:

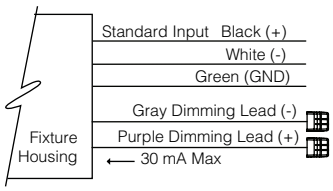
- LEDs shall be mounted to a metal printed circuit board assembly (MCPCB).
- Optical lenses shall be clear injection molded PMMA acrylic.
- Each MCPCB and optic shall be sealed to the diecast housing and sealed with a continuous one piece injection molded silicone rubber gasket.
- Patent Pending design of optical array shall independently shield each LED optic across the length of the aperture.
- Optional fixture finish optical surfaces shall not exceed BUG ratings of the standard white finish and shall be greater than or equal to the delivered lumens of the optional matte black optical surface finish.

Electrical Components

- Standard programmable driver allows for programmable drive current settings.
- Electrical components are stategically located in the driver gear compartment with a molded silicon grommet seal to provide separation from the optical chamber.
- Maximum lightning surge current 20KA with thermally protected varistor technology. Surge suppression is series circuited preventing total fixture failure. ANSI/IEEE C62.41 Category C High.
- Open circuit fault will turn off the luminaire in order to protect the sensitive electronics and acts as a signal for maintenance.
- Programmable Driver is rated for -40°C starting.
- "Thermal Shield", primary side, thermister provides protection for the sustainable life of electronic components.

Dimming:

- Dimming range from 100% to 10% through the use of the standard 0-10V interface on the programmable driver.
- Modular wiring harness in the service area provides user access to the dimming circuitry.
- Dimming circuitry compatible with 0-10V, user-defined control devices.
- Optional factory programmed dimming profile.



Fusing:

SF for 120, 277, and 347 Line volts

DF for 208, 240, and 480 Line volts

Hight temperature fuse holders factory installed inside the fixture housing.

Fuse is included.

Finish:

Fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat.

Standard colors include (BLS) Black Gloss Smooth, (BLT) Black Matte Textured, (DBS) Dark Bronze Smooth, (GTT) Graphite Matte Textured, (LGS) Light Gray Smooth, (PSS) Platinum Silver Smooth, (VGS) Verde Green Smooth, (WHS) White Gloss Smooth, and (CC) Custom Color (Include RAL#).

Certifications and Listings:

- IUL 1598 Standard for Luminaires.
- IUL 8750 Standard for Safety for Light
- IEmitting Diode (LED) Equipment for use in Lighting Products.
- ICSA C22.2#250.0 Luminaires.
- ANSI C136.31-2010 Vibration tested and compliant 1.5G and 4G reference page 9
- IRoHS compliant.
- IIP66 rated.
- IIEC 66262 Mechanical Impact Code IK09.
- IDA approved, 3000K and warmer CCTs only.

CAUTION:

Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

WARRANTY:

For full warranty see: http://www.hubbelllighting.com/resources/warranty

Kim Lighting reserves the right to change specifications without notice.

CONTROLS

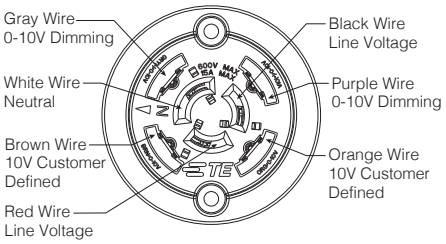
Photocell Receptacle

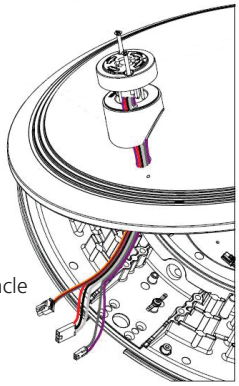
7PR

Fully gasketed and wired 7-pin receptacle option. Easy access location above the electrical compartment. 7-pin construction allows for a user-defined interface and provides a controlled definition of operational performance. ANSI twist-lock control module by-others.

Standard customer operation modes:

1. Traditional on/off photoelectric control.
2. 5-pin wireless photoelectric control for added dimming feature.
3. 7-pin wireless photoelectric control for dimming and additional I/O connections for customer use.





7-Pin receptacle placement

Wireless Controls

wiSCAPE™

Hubbell Control Solution's wiSCAPE™ wireless control modules allow an individual fixture to managed, monitored and measured. The modules communicate securely over a robust certified meshed radio signal. The wiSCAPE modules provide on/off/dim control, external device input, alerts and metering.

WIR-RME-L

wiSCAPE External Module,120-480V, 1000ft range (LOS), Internal Photocell, 1 Digital Input, Compatible with the A-25-7H option

SiteSync™[1]

SiteSync™ wireless control system for reduction in energy and maintenance cost while optimizing light quality 24/7. See ordering information or visit www.hubbelllighting.com/products/sitesync for more details.

Dimming WASP Occupancy Sensor

WSP

The Dimming WASP Outdoor Occupancy Sensor is specifically designed to provide 0-10VDC output for the control of dimmable fixtures. Easy to use dipswitches allow the user to adjust sensor time delay and sensitivity as well as set unoccupied and occupied dimming levels. Sensors also feature a daylight sensor for ON/OFF control of fixtures when there is sufficient natural light. Visit https://hubbellcdn.com/installationmanuals/2102B_Dimming_WASP_Install.pdf for more details.

Pole Mounted

Round Pole-Mounted Occupancy Sensor up to 16'. Select voltage and finish color.

SCL-R

Round Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCL-R44/277[2]/BL[3]

Square Pole-Mounted Occupancy Sensor up to 16'. Select voltage and finish color.

SCL-S

Square Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for square pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCL-L/277[2]/BL[3]

Round Pole-Mounted Occupancy Sensor 16' to 30'. Select voltage and finish color.

SCH-R

Round Pole-Mounted Occupancy Sensor: 16' to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCH-R4[4]/277[2]/BL[3]

Square Pole-Mounted Occupancy Sensor 16' to 30'. Select voltage and finish color.

SCH-S

Square Pole-Mounted Occupancy Sensor: 16 to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

Ordering Example: SCH-S/277[2]/BL[3]

AstroDIM

AstroDIM provides multi-stage night-time power reduction based on an internal timer referenced to the power on/off time. There is no need for an external control infrastructure. The unit automatically performs a dimming profile based on the predefined scheduled reference to the midpoint, which is calculated based on the power on/off times.

[1]PRECOMMISSIONED SITESYNC ORDERING INFORMATION: When ordering a fixture with the SiteSync lighting control option, additional information will be required to complete the order. The SiteSync Commissioning Form or alternate schedule information must be completed. This form includes Project location, Group information, and Operating schedules. For more detailed information please visit www.HubbellLighting.com/products/sitesync or contact Hubbell Lighting tech support at (800) 345-4928.

SiteSync fixtures with occupancy sensor (SWPM) require the mounting height of the fixture for selection of the lens.

Examples:

SiteSync only : UR20/56L-75/3K7/UNV/ASQ/BL/SWP

SiteSync with Motion Control: UR20/56L-75/3K7/UNV/ASQ/BL/SWPM-40F

[2]Voltage, [3]Color, [4]Pole Diameter,

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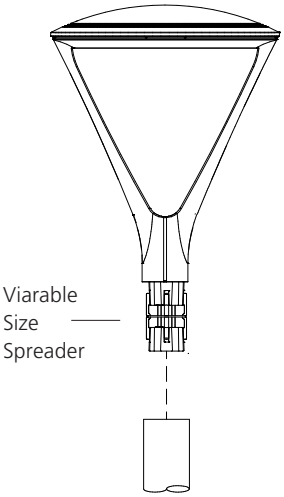
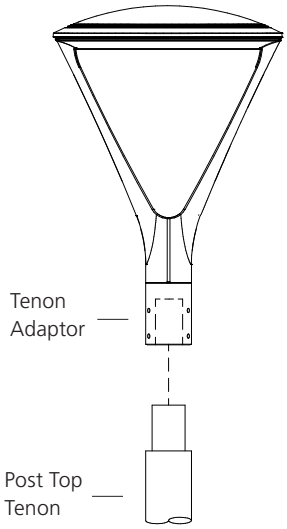
MOUNTING INSTALLATION

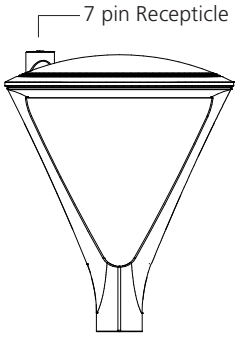


Flush Mount
FM33/44

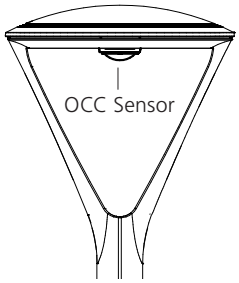


Post Top
PT23/24/34

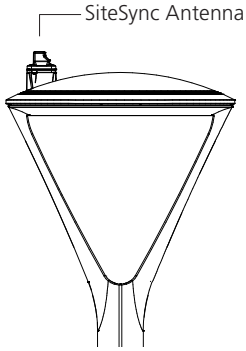
SENSOR PLACEMENT



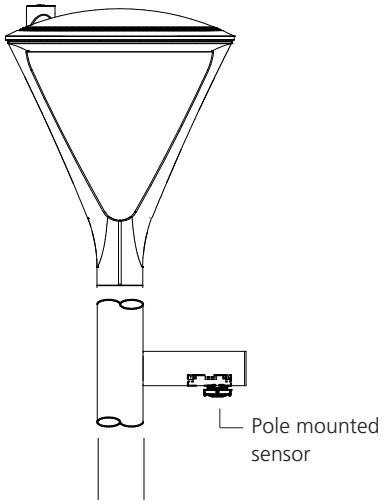
7 pin PCR
7PR



OCC Sensor
NX or WSP



SiteSync
SW7PR



Pole Mounted Sensor
SCL-R, SCL-S, SCH-R,
SCH-S

MOUNTING VIBRATION RATINGS

UR 20 Arm		UR28 Arm		UR 20 Post Top		UR 28 Post Top	
Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating
ASQ	4G	**ASQ**	4G	**FM33**	4G	**FM44**	1.5G
A34	4G	**A34**	4G	**FM44**	1.5G	**FM45**	1.5G
A46	4G	**A46**	4G	**PT23**	4G	**PT24**	1.5G
MAF	4G	**MAF**	4G	**PT24**	4G	**PT34**	1.5G
				PT34	1.5G	**PT25**	1.5G
						PT35	1.5G

For the 4 G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Test Level 1 Normal Applications, Vibration Test Level 2 Bridge/Overpass Applications, and Vibration Test Level 3

For the 1.5G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Level 1 Bridge/Overpass Applications

Kim Lighting reserves the right to change specifications without notice.

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

UR20

ARCHITECTURAL AREA/SITE

Ouro™

FEATURES

- 20" size in post top, pole and wall mount
- High performance optics up to 17,000 delivered lumens
- Elegant form factor
- Diffusion lens option
- SiteSync™ wireless control options
- UL/cUL listed for wet locations, IP65 and 3G vibration rated

c UL us LISTED

ida DARK SKY APPROVED 2016

3000K and warmer CCTs only

DLC DLC LISTED

IK10

IP66



Ouro Arm Mount

CONTROL TECHNOLOGY

Bluetooth® DMX

RELATED PRODUCTS

- Ouro Small Post Top
- Ouro Large Post Top
- Ouro Large Arm Mount

SPECIFICATIONS

CONSTRUCTION

- Low copper aluminum alloy die-casting is designed as one-piece with internal cooling fins.
- Solid, cast aluminum wall creates a thermal barrier between the optical and electrical compartments.
- Molded silicone gasket throughout insures the sealing between the two compartments and provides ingress protection.
- Housing is designed with integral LED heat sink utilized for thermal transfer and for securing the location of each LED module.
- IK09 rated enclosure protects electrical equipment against external mechanical impacts.
- All external fasteners are stainless steel.
- One-piece low copper aluminum alloy die-cast lens frame is secured to housing with 6 screws.

OPTICS

- LEDs mount to a metal printed circuit board assembly (MCPCB).
- Optical lenses are clear injection molded PMMA acrylic.
- Optional Backlight Control on each LED module to completely control unwanted backlight.

INSTALLATION

- Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

ELECTRICAL

- Universal voltage, 120 through 277V with a ±10% tolerance. Driver is Underwriters Laboratories listed.
- High voltage configurations, 347/480. Driver has a 0-10V dimming interface for multi-level illumination options. Driver is Underwriters Laboratories listed.
- "Thermal Shield", secondary side, thermistor provides protection for the sustainable life of LED module and electronic components
- Drivers shall have greater than a 0.9 power factor, less than 20% harmonic distortion, and be suitable for operation in -40°C to 40°C ambient environments.
- Luminaire shall be capable of operating at 100% brightness in a 40°C environment. Both driver and optical array have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C.
- Surge protection: 10,000k in parallel, 20,000k in series
- Wiring: No. 18AWM rated 105°C, wet rating.

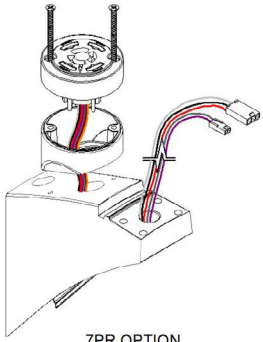
CONTROLS

7PR

- Fully gasketed and wired 7-pin receptacle option. Easy access location above the electrical compartment. 7-pin construction allows for a user-defined interface and provides a controlled definition of operational performance. ANSI twist-lock control module by-others.

Standard customer operation modes:

- Traditional on/off photoelectric control.
- 5-pin wireless photoelectric control for added dimming feature.
- 7-pin wireless photoelectric control for for dimming and additional I/O connections for customer use.



7PR OPTION

(Specifications continued on page 3)

KEY DATA	
Lumen Range	2888 - 17080
Wattage Range	25 - 150
Efficacy Range (LPW)	100 -136
Reported Life (Hours)	L70/>60,000
Weight	32 lbs - 14.5 Kg
EPA	0.372

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HUBBELL® HUBBELL Lighting

KIM LIGHTING

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

UR20

ARCHITECTURAL AREA/SITE

ORDERING GUIDE

Example: UR20-24L-25-3K8-3-L-UNV-ASQ-BLT-7PR-BC-SWTAB

CATALOG #

HOUSING

UR20

Model	LED Engine	CCT	Distribution	Rotation	Voltage
UR20 Ouro	**No Lens or Clear Lens** **24L-25** 3,000 lm **24L-65** 7,000 lm **56L-75** 10,000 lm **56L-110** 15,000 lm **56L-140** 17,000 lm **HDL - High Diffusion Lens** **28L-30** 3,000 lm **28L-70** 7,000 lm **68L-80** 9,000 lm **68L-115** 13,000 lm **68L-150** 15,000 lm	**AM** Amber, 590nm peak **3K7** 3000K, 70 CRI **3K8** 3000K, 80 CRI **3K9** 3000K, 90 CRI **4K7** 4000K, 70 CRI **4K8** 4000K, 80 CRI **5K7** 5000K, 70 CRI	**No Lens or Clear Lens** **FR** Type 1/Front Row **2** Type II **3** Type III **4** Type IV **4W** Type IV Wide **5QM** Type V Square Medium **5QN** Type V Square Narrow **5R** Type V Rectangular **5W** Type V Wide (Round) **HDL - High Diffusion Lens** **3** Type III/Asymmetric **5W** Type V/Symmetric	Blank for no rotation **L** [1] Optic rotation left **R** [1] Optic rotation right	**UNV** 120-277V **347** 347V **480** 480V **DALI** 120-277V† †Consult factory

Mounting	Fixture Finish	Control Options	Options	Control Accessories
ASQ Arm Square pole **A34** Arm mt 3.3-4.2" OD pole **A46** Arm mt 4.5-6.0" OD pole **MAF** Horizontal Slip Fitter 2 3/8" OD arm **SVSF** Square Vertical Slipfitter for 2"Tenon (2-3/8"OD) **VSF** Round Vertical Slipfitter for 2"Tenon (2-3/8"OD) **WB** Wall Bracket	**BLS** Black Smooth **BLT** Black Textured **DBS** Dark Bronze Smooth **GTT** Graphite Textured **LGS** Light Gray Smooth **PSS** Platinum Silver Smooth **VGS** Verde Green Smooth **WHS** White Smooth **CC** Custom Color* *Consult factory	**7PR-TL** 7 pin PCR with twist lock photocontrol **7PR-SC** 7 pin PCR with shorting cap **7PR** 7 pin PCR, wireless control enabled **AD-01** [2] AstroDIM: 50% output at midnight **AD-02** [2] AstroDIM: 50% output midnight to 4 AM **AD-03** [2] AstroDIM: 50% output 10PM **AD-04** [2] AstroDIM: 50% output 10PM to 4AM **NXWE** NX Wireless Enabled **SWP** [2,3,4] SiteSync Pre commission **SWPM-40F** [2,3,4,5] SiteSync with Sensor 9' to 40' MH **WSP-40F-1** [2,5] Dimming Occ. Sensor for up to 40' MH, 120/277/347V **WSP-40F-2** [2,5] Dimming Occ. Sensor for up to 40' MH, 208/240V **WSP-40F-3** [2,5] Dimming Occ. Sensor for up to 40' MH, 480V **NXSPW14F** [2,5] NX Wireless, PIR Sensor, 14' **NXSPW30F** [2,5] NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'. **NXSP14F** [2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' **NXSP30F** [2,5] NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'	**BC** [6] Back-light Control **SF** Single Fuse **DF** Double Fuse **TB** Terminal Block **CLR** [6] Clear Lens **TL** Tamper proof latch	**SW7PR** [2,3] SiteSync with 7 pin PCR **SWUSB** SiteSync Software on USB **SWTAB** SiteSync Windows® Tablet **SWBRG** SiteSync Wireless Bridge Node **WIR-RME-L** wiSCAPE External Fixture Module **SCH-R** Occ. Sensor for Round Pole **SCH-S** Occ. Sensor for Square Pole **NXOFM-1R1D-UNV** NX 7-pin Module

Microsoft, Encarta, MSN, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

1 Not available with 5QM, 5QN, and 5W distributions.
2 Not available with other sensor or wireless control options.
3 Specify group and zone at time of order. See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node.
4 Not available with 347V and 480V
5 24L & 56L only.
6 Not available with Type V distributions or HDL option.

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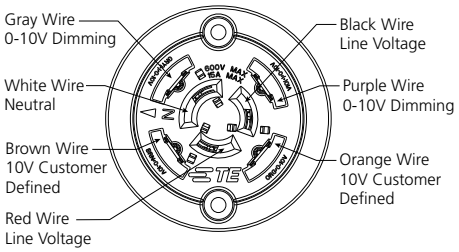
HUBBELL Lighting

SPECIFICATIONS (CONTINUED)

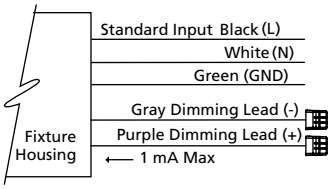
CONTROLS (CONTINUED)

Photocell receptacle wiring diagram



DIMMING:

- Dimming range from 100% to 10% through the use of the standard 0-10V interface on the programmable driver.
- Modular wiring harness in the service area provides user access to the dimming circuitry.
- Dimming circuitry compatible with 0-10V, user-defined control devices.
- Optional factory programmed dimming profile.



WIRELESS CONTROLS
WISCAPE™

- Hubbell Control Solution's wiSCAPE™ wireless control modules allow an individual fixture to managed, monitored and measured. The modules communicate securely over a robust certified meshed radio signal. The wiSCAPE modules provide on/off/dim control, external device input, alerts and metering.

WIR-RME-L

- wiSCAPE External Module,120-480V, 1000ft range (LOS), Internal Photocell, 1 Digital Input, Compatible with the A-25-7H option

SITESYNC™[1]

- SiteSync™ wireless control system for reduction in energy and maintenance cost while optimizing light quality 24/7. See ordering information or visit www.hubbelllighting.com/products/sitesync for more details.

NX DISTRIBUTED INTELIGENCE™

- Hubbell Control Solutions' NX Distributed Intelligence™ lighting control platform utilizes a Distributed Network Architecture (DNA) that connects intelligent devices including luminaires, controllers, panels, occupancy sensors, photocells, wall switches and dimmers, creating a system with an unmatched level of reliability, scalability and simplicity

POLE MOUNTED

Round Pole-Mounted Occupancy
Sensor up to 16'. Select voltage and finish color.

SCL-R

- Round Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.
- Ordering Example: SCL-R44/277[2]/BL[3]

SQUARE POLE-MOUNTED OCCUPANCY

Sensor up to 16'. Select voltage and finish color.

SCL-S

- Square Pole-Mounted Occupancy Sensor up to 16' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for square pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.
- Ordering Example: SCL-L/277[2]/BL[3]

ROUND POLE-MOUNTED OCCUPANCY

Sensor 16' to 30'. Select voltage and finish color.

SCH-R

Round Pole-Mounted Occupancy Sensor: 16' to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

- Ordering Example: SCH-R4[4]/277[2]/BL[3]

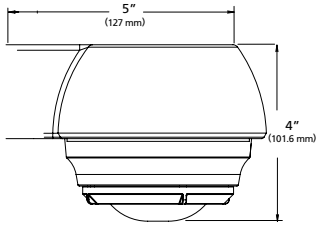
SQUARE POLE-MOUNTED OCCUPANCY

Sensor 16' to 30'. Select voltage and finish color.

SCH-S

Square Pole-Mounted Occupancy Sensor: 16 to 30' - an outdoor occupancy sensor with 0-10V interface dimming control that mounts directly to the pole. Wide 360° pattern. Module colors are available in Black, Gray, and White. Module is cut for round pole mounting. Pole diameter is needed upon order. Poles to be drilled in the field will be provided with installation instructions.

- Ordering Example: SCH-S/277[2]/BL[3]



ASTRODIM

- AstroDIM provides multi-stage night-time power reduction based on an internal timer referenced to the power on/off time. There is no need for an external control infrastructure. The unit automatically performs a dimming profile based on the predefined scheduled reference to the midpoint, which is calculated based on the power on/off times.

OPTIONAL FUSING:

- SF for 120, 277, and 347 Line volts
- DF for 208, 240, and 480 Line volts

(Specifications continued on page 4)

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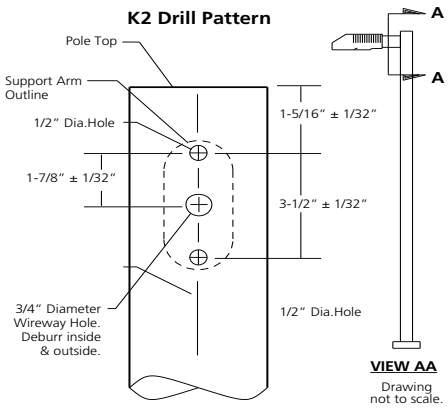
SPECIFICATIONS (CONTINUED)

MOUNTING
- Hight temperature fuse holders factory installed inside the fixture housing.
- Fuse is included.

SUPPORT ARM:
- Die-cast, low copper aluminum alloy, with splice access cover.
- Die-cast pole adaptor and an internal reinforcing plate are provided with a wire strain relief.
- The arm adapter is square or circular cut for specified pole size and shape.
- For field wire connections, a terminal block is mounted in the arm cavity and accessible behind the splice access cover. The block accepts #14 to #8 wire sizes and is factory prewired to the electrical module's quick-disconnect plug inside the electrical compartment.

OPTIONAL SLIP-FITTER:
- Internally accessible slip-fitter attaches to a 1-1/4" to 2-3/8" tenon and allows hands-free wiring and maintenance.

OPTIONAL WALL MOUNT:
- Optional, cast aluminum mounting plate attaches to a wall over a junction box and the speed mount is bolted to the cover plate. To complete the wiring, the luminaire assembly slides over the mounting plate.



CAUTION
- Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

CERTIFICATIONS AND LISTINGS
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40˚C ambient temperatures
- ANSI C136.31-2010 Vibration tested and compliant 1.5G and 4G reference page 5
- IEC 66262 Mechanical Impact Code IK10
- IDA approved, 3000K and warmer CCTs only.
- IP66 certified
- RoHS compliant

WARRANTY
- 5 year warranty
- See HLI Standard Warranty for additional information

†PRECOMMISSIONED SITESYNC ORDERING INFORMATION: When ordering a fixture with the SiteSync lighting control option, additional information will be required to complete the order. The SiteSync Commissioning Form or alternate schedule information must be completed. This form includes Project location, Group information, and Operating schedules. For more detailed information please visit www.HubbellLighting.com/products/sitesync or contact Hubbell Lighting tech support at (800) 345-4928

Examples:
PA7R/FT/NU3/12L-020-3K7/42A/TT/SWP/UNV/LR

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KIM LIGHTING

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

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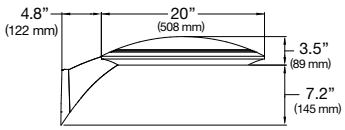
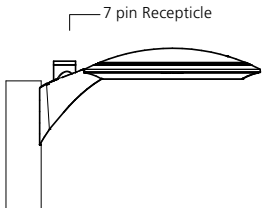
DIMENSIONS

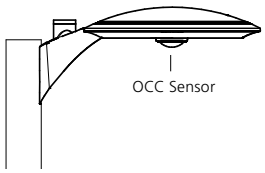


Weight: 32 lbs EPA: .372

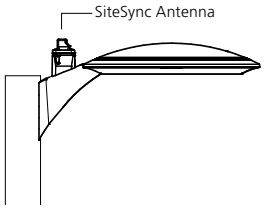
SENSOR PLACEMENT



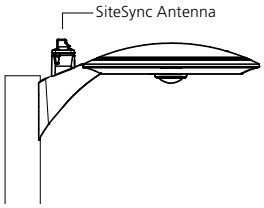
7 pin PCR
7PR



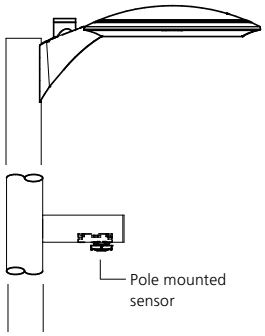
OCC Sensor
NX or WSP



SiteSync
SWP



SiteSync with sensor
SWPM-40F



Pole Mounted Sensor
SCL-R, SCL-S, SCH-R, SCH-S

MOUNTING VIBRATION RATINGS

UR 20 Arm		UR28 Arm		UR 20 Post Top		UR 28 Post Top	
Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating	Ordering Code	Rating
ASQ	4G	ASQ	4G	FM33	4G	FM44	1.5G
A34	4G	A34	4G	FM44	1.5G	FM45	1.5G
A46	4G	A46	4G	PT23	4G	PT24	1.5G
MAF	4G	MAF	4G	PT24	4G	PT34	1.5G
				PT34	1.5G	PT25	1.5G
						PT35	1.5G

For the 4 G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Test Level 1 Normal Applications, Vibration Test Level 2 Bridge/Overpass Applications, and Vibration Test Level 3

For the 1.5G test, ANSI C136.31-2010 Vibration is tested to comply with Vibration Level 1 Bridge/Overpass Applications

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DELIVERED LUMENS

LEDs #	Lumens Package	Drive Current	Nominal Watts	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
						Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
							B	U	G			B	U	G			B	U	G	
24L	3,000	298mA	25	No lens	FR	3258	0	0	0	128	3467	0	0	0	136	3443	0	0	0	135
					FR-BC	2141	0	0	0	84	2278	0	0	0	89	2263	0	0	0	89
					2	3107	1	0	1	122	3306	1	0	1	130	3284	1	0	1	129
					2-BC	1849	0	0	0	73	1967	0	0	0	77	1954	0	0	0	77
					3	3128	2	0	1	123	3329	2	0	1	131	3306	2	0	1	130
					3-BC	1870	0	0	1	73	1990	0	0	1	78	1977	0	0	1	78
					4	3118	0	0	1	122	3318	0	0	1	130	3295	0	0	1	129
					4-BC	2330	0	0	1	92	2479	0	0	1	97	2462	0	0	1	97
					4W	3242	1	0	1	127	3449	1	0	1	135	3426	1	0	1	135
					4W-BC	2011	0	0	1	79	2140	0	0	1	84	2125	0	0	1	83
					5QM	2999	2	0	0	118	3191	2	0	0	125	3169	2	0	0	124
					5QN	2888	2	0	0	113	3073	2	0	0	121	3052	2	0	0	120
					5R	3092	2	0	2	121	3291	2	0	2	129	3268	2	0	2	128
					5W	3059	2	0	1	120	3255	2	0	1	128	3233	2	0	1	127
				clear lens	FR	3083	0	0	0	121	3280	0	0	0	128	3258	0	0	0	128
					FR-BC	2026	0	0	0	79	2155	0	0	0	84	2141	0	0	0	84
					2	2940	1	0	1	115	3128	1	0	1	123	3107	1	0	1	122
					2-BC	1749	0	0	0	68	1861	0	0	0	73	1848	0	0	0	72
					3	2959	1	0	1	116	3149	1	0	1	123	3127	1	0	1	122
					3-BC	1732	0	0	1	68	1843	0	0	1	72	1830	0	0	1	72
					4	2950	0	0	1	116	3139	0	0	1	123	3117	0	0	1	122
					4-BC	1847	0	0	1	72	1966	0	0	1	77	1952	0	0	0	76
					4W	3067	1	0	1	120	3263	1	0	1	128	3241	1	0	1	127
					4W-BC	1903	0	0	1	75	2025	0	0	1	79	2011	0	0	1	79
					5QM	2837	2	0	0	111	3019	2	0	0	118	2998	2	0	0	117
					5QN	2732	2	0	0	107	2907	2	0	0	114	2887	2	0	0	113
					5R	2926	2	0	2	115	3113	2	0	2	122	3092	2	0	2	121
					5W	2894	2	0	1	113	3079	2	0	1	121	3058	2	0	1	120
28L		298mA	30	HDL lens	3	2880	1	0	1	99	3065	1	0	1	105	2971	1	0	1	102
					5W	2946	1	0	1	101	3134	1	0	1	107	3113	1	0	1	106

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DELIVERED LUMENS (CONTINUED)

LEDs #	Lumens Package	Drive Current	Nominal Watts	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
						Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
							B	U	G			B	U	G			B	U	G	
24L	7,000	800mA	65	No lens	FR	7507	1	0	1	115	7988	1	0	1	123	7933	1	0	1	122
					FR-BC	4717	0	0	0	73	5019	0	0	0	77	4985	0	0	0	77
					2	6938	1	0	2	107	7382	1	0	2	114	7332	1	0	2	113
					2-BC	4072	0	0	1	63	4334	0	0	1	67	4304	0	0	1	66
					3	6892	1	0	2	106	7333	1	0	2	113	7283	1	0	2	112
					3-BC	4121	0	0	1	63	4385	0	0	1	67	4355	0	0	1	67
					4	6927	1	0	2	107	7371	1	0	2	113	7320	1	0	2	113
					4-BC	5133	0	0	2	79	5461	0	0	2	84	5424	0	0	2	83
					4W	7055	1	0	2	109	7507	1	0	2	115	7456	1	0	2	115
					4W-BC	4431	0	0	2	68	4715	0	0	2	73	4682	0	0	2	72
					5QM	7188	3	0	1	111	7649	3	0	1	118	7597	3	0	1	117
					5QN	7465	3	0	0	115	7944	3	0	0	122	7889	3	0	0	121
					5R	7125	3	0	3	110	7582	3	0	3	117	7530	3	0	3	116
					5W	7048	3	0	2	108	7499	3	0	2	115	7448	3	0	2	115
				clear lens	FR	7149	1	0	1	108	7607	1	0	1	115	7555	1	0	1	114
					FR-BC	4492	0	0	0	68	4780	0	0	0	72	4747	0	0	0	72
					2	6607	1	0	2	100	7030	1	0	2	107	6982	1	0	2	106
					2-BC	3878	0	0	1	59	4127	0	0	1	63	4099	0	0	1	62
					3	6563	1	0	2	99	6984	1	0	2	106	6936	1	0	2	105
					3-BC	3841	0	0	1	59	4087	0	0	1	63	4059	0	0	1	62
					4	6597	1	0	2	100	7019	1	0	2	106	6971	1	0	2	106
					4-BC	4888	0	0	2	74	5201	0	0	2	79	5165	0	0	2	78
					4W	6719	1	0	2	102	7149	1	0	2	108	7100	1	0	2	108
					4W-BC	4219	0	0	2	64	4490	0	0	2	68	4459	0	0	2	68
					5QM	6846	3	0	1	104	7284	3	0	1	110	7235	3	0	1	110
					5QN	7109	3	0	0	108	7565	3	0	0	115	7513	3	0	0	114
					5R	6785	3	0	3	103	7220	3	0	3	109	7171	3	0	3	109
					5W	6711	3	0	1	102	7142	3	0	1	108	7093	3	0	1	107
28L		700mA	70	HDL lens	3	6481	2	0	2	98	6897	2	0	2	104	6685	2	0	2	96
					5W	6628	2	0	1	100	7053	2	0	1	107	6952	2	0	1	100

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Lumens Package	Drive Current	Nominal Watts	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
						Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
							B	U	G			B	U	G			B	U	G	
56L	10,000	420mA	75	No lens	FR	10354	1	0	1	138	11018	1	0	1	146	10942	1	0	1	145
					FR-BC	6506	0	0	1	87	6923	0	0	1	92	6875	0	0	1	92
					2	9569	2	0	2	127	10182	2	0	2	135	10112	2	0	2	134
					2-BC	5617	0	0	1	75	5977	0	0	1	80	5936	0	0	1	79
					3	9505	1	0	2	125	10114	1	0	2	134	10045	1	0	2	133
					3-BC	5683	0	0	2	76	6047	0	0	2	81	6006	0	0	2	79
					4	9554	1	0	2	127	10166	1	0	2	135	10078	1	0	2	134
					4-BC	7079	0	0	2	94	7533	0	0	2	100	7481	0	0	2	99
					4W	9731	1	0	2	129	10355	2	0	3	138	10284	2	0	3	137
					4W-BC	6111	0	0	2	81	6503	0	0	2	87	6458	0	0	2	86
					5QM	9915	3	0	1	132	10550	3	0	2	140	10478	3	0	2	139
					5QN	10296	3	0	1	137	10956	3	0	1	146	10881	3	0	1	145
					5R	9827	3	0	3	131	10457	3	0	3	139	10385	3	0	3	138
					5W	9720	4	0	2	129	10343	4	0	2	137	10272	4	0	2	137
				clear lens	FR	9860	1	0	1	130	10492	1	0	1	139	10420	1	0	1	138
					FR-BC	6196	0	0	0	83	6593	0	0	1	88	6547	0	0	1	87
					2	9112	1	0	2	120	9696	2	0	2	128	9630	2	0	2	127
					2-BC	5349	0	0	1	71	5692	0	0	1	76	5653	0	0	1	75
					3	9052	1	0	2	120	9632	1	0	2	127	9566	1	0	2	126
					3-BC	5297	0	0	2	71	5637	0	0	2	75	5598	0	0	2	74
					4	9098	1	0	2	120	9681	1	0	2	128	9615	1	0	2	127
					4-BC	6741	0	0	2	90	7174	0	0	2	96	7124	0	0	2	95
					4W	9267	1	0	2	122	9861	1	0	2	130	9793	1	0	2	129
					4W-BC	5820	0	0	2	78	6193	0	0	2	83	6150	0	0	2	82
					5QM	9442	3	0	1	125	10047	3	0	1	133	9978	3	0	1	132
					5QN	9805	3	0	1	130	10434	3	0	1	138	10362	3	0	1	137
					5R	9358	3	0	3	124	9958	3	0	3	132	9890	3	0	3	131
					5W	9257	4	0	2	122	9850	4	0	2	130	9782	4	0	2	129
68L		350mA	80	HDL lens	3	8418	2	0	2	107	8958	2	0	2	113	8896	2	0	2	113
					5W	8609	3	0	1	109	9160	3	0	1	116	9252	3	0	1	117

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DELIVERED LUMENS (CONTINUED)

LEDs #	Lumens Package	Drive Current	Nominal Watts	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
						Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
							B	U	G			B	U	G			B	U	G	
56L	15,000	600mA	110	No lens	FR	15041	1	0	2	139	16005	1	0	2	147	15895	1	0	2	146
					FR-BC	9451	0	0	1	87	10056	0	0	1	93	9987	0	0	1	92
					2	13900	2	0	2	128	14791	2	0	2	136	14689	2	0	2	135
					2-BC	8159	0	0	2	75	8682	0	0	2	80	8623	0	0	2	79
					3	13808	2	0	3	127	14692	2	0	3	135	14592	2	0	3	134
					3-BC	8256	1	0	2	75	8785	1	0	2	80	8725	1	0	2	79
					4	13878	1	0	3	128	14768	1	0	3	136	14667	1	0	3	135
					4-BC	10283	1	0	2	95	10942	1	0	3	101	10867	1	0	3	100
					4W	14135	2	0	3	130	15041	2	0	4	139	14938	2	0	3	138
					4W-BC	8877	0	0	2	82	9446	0	0	2	87	9381	0	0	2	86
					5QM	14402	4	0	2	133	15325	4	0	2	141	15220	4	0	2	140
					5QN	14957	4	0	1	138	15915	4	0	1	147	15806	4	0	1	146
					5R	14275	4	0	4	132	15190	4	0	4	140	15086	4	0	4	139
					5W	14120	4	0	2	130	15025	4	0	2	138	14922	4	0	2	138
				clear lens	FR	14230	1	0	1	132	15142	1	0	2	140	15038	1	0	2	139
					FR-BC	8941	0	0	1	83	9514	0	0	1	88	9449	0	0	1	87
					2	13151	2	0	2	122	13994	2	0	2	129	13898	2	0	2	129
					2-BC	7720	0	0	2	71	8215	0	0	2	76	8158	0	0	2	75
					3	13064	2	0	2	121	13901	2	0	2	129	13806	2	0	2	128
					3-BC	7645	1	0	2	69	8135	1	0	2	74	8079	1	0	2	73
					4	13131	1	0	3	121	13972	1	0	3	129	13876	1	0	3	128
					4-BC	9729	1	0	2	90	10353	1	0	2	94	10282	1	0	2	95
					4W	13374	2	0	3	124	14231	2	0	3	132	14134	2	0	3	131
					4W-BC	8399	0	0	2	78	8937	0	0	2	83	8876	0	0	2	82
					5QM	13626	3	0	2	126	14500	4	0	2	134	14400	4	0	2	133
					5QN	14151	4	0	1	131	15058	4	0	1	139	14955	4	0	1	138
					5R	13506	4	0	4	125	14372	4	0	4	133	14273	4	0	4	132
					5W	13359	4	0	2	124	14215	4	0	2	132	14118	4	0	2	131
68L		500mA	115	HDL lens	3	12410	3	0	2	109	13206	3	0	3	116	13115	3	0	3	116
					5W	12691	3	0	2	112	13505	3	0	2	119	13412	3	0	2	118

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ARCHITECTURAL AREA/SITE

DELIVERED LUMENS (CONTINUED)

LEDs #	Lumens Package	Drive Current	Nominal Watts	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
						Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
							B	U	G			B	U	G			B	U	G	
56L	17,000	750mA	140	No lens	FR	17031	2	0	2	124	18123	2	0	2	132	17999	2	0	2	131
					FR-BC	10701	0	0	1	78	11387	0	0	1	83	11309	0	0	1	82
					2	15740	2	0	2	114	16748	2	0	2	122	16634	2	0	2	121
					2-BC	9239	1	0	2	67	9831	1	0	2	71	9764	1	0	2	71
					3	15635	2	0	3	113	16637	2	0	3	121	16523	2	0	3	120
					3-BC	9348	1	0	2	67	9947	1	0	2	71	9879	1	0	2	71
					4	15715	1	0	3	114	16722	1	0	3	121	16608	1	0	3	121
					4-BC	11644	1	0	3	85	12391	1	0	3	90	12306	1	0	3	89
					4W	16006	2	0	4	116	17032	2	0	4	124	16915	2	0	4	123
					4W-BC	10052	1	0	2	73	10696	1	0	3	78	10623	1	0	3	77
					5QM	16309	4	0	2	118	17354	4	0	2	126	17235	4	0	2	125
					5QN	16936	4	0	1	123	18022	4	0	1	131	17898	4	0	1	130
					5R	16164	4	0	4	117	17200	4	0	4	125	17082	4	0	4	124
					5W	15989	4	0	2	116	17013	4	0	2	123	16897	4	0	2	123
				clear lens	FR	16162	1	0	2	116	17198	2	0	2	124	17080	2	0	2	123
					FR-BC	10155	0	0	1	73	10659	0	0	1	77	10732	0	0	1	77
					2	14936	2	0	2	108	15894	2	0	2	115	15785	2	0	2	114
					2-BC	8768	1	0	2	63	9330	1	0	2	67	9266	1	0	2	67
					3	14837	2	0	3	107	15788	2	0	3	114	15680	2	0	3	113
					3-BC	8683	1	0	2	62	9239	1	0	2	66	9176	1	0	2	66
					4	14913	1	0	3	107	15869	1	0	3	114	15760	1	0	3	114
					4-BC	11050	1	0	3	80	11758	1	0	3	85	11678	1	0	3	84
					4W	15189	2	0	4	109	16163	2	0	4	116	16052	2	0	4	116
					4W-BC	9539	0	0	2	69	10150	1	0	2	73	10081	1	0	2	73
					5QM	15476	4	0	2	112	16468	4	0	2	119	16355	4	0	2	118
					5QN	16072	4	0	1	116	17102	4	0	1	123	16985	4	0	1	122
					5R	15339	4	0	4	111	16323	4	0	4	118	16211	4	0	4	117
					5W	15173	4	0	2	109	16145	4	0	2	116	16035	4	0	2	116
68L		625mA	150	HDL lens	3	14192	3	0	3	96	14999	3	0	3	101	14896	3	0	3	101
					5W	14514	3	0	2	98	15338	3	0	2	104	15233	3	0	2	103

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HUBBELL Lighting

UR20

ARCHITECTURAL AREA/SITE

PHOTOMETRY

UR20-56L-140-4K7-FR

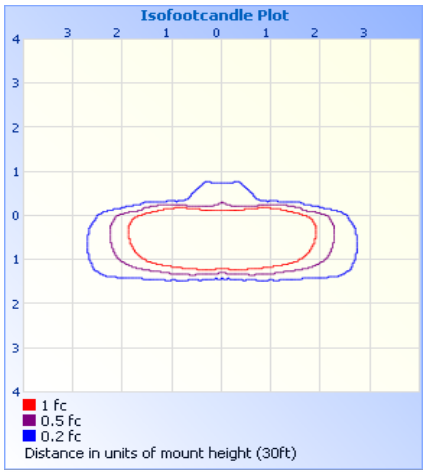
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18123**
Watts	**140**
Efficacy	**129.5**
IES Type	**II**
BUG Rating	**B2-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	16164	89.2%
Downward House Side	1959	10.8%
Downward Total	18123	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18123	100%

ISOFOOT CANDLE PLOT



UR20-56L-140-4K7-2

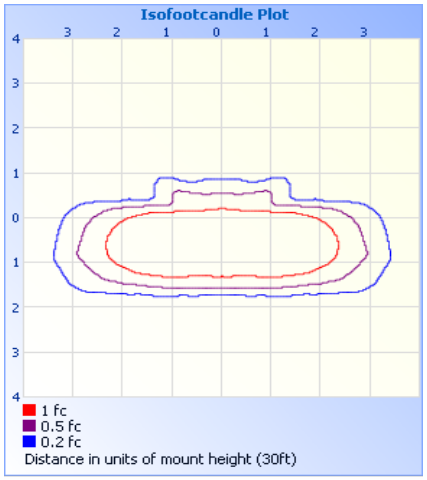
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**16748**
Watts	**140**
Efficacy	**119.6**
IES Type	**II**
BUG Rating	**B2-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	13888	82.9%
Downward House Side	2860	17.1%
Downward Total	16748	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	16748	100%

ISOFOOT CANDLE PLOT



UR20-56L-140-4K7-3

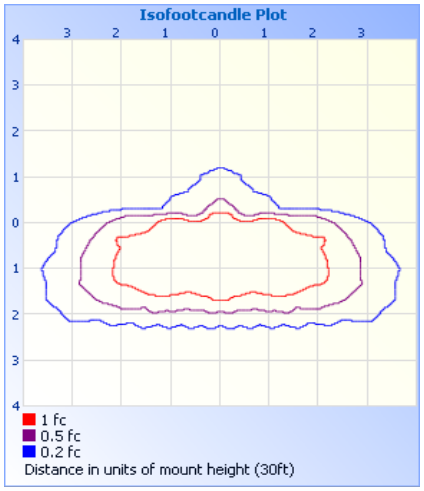
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**16637**
Watts	**140**
Efficacy	**118.8**
IES Type	**III**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14461	86.9%
Downward House Side	2176	13.1%
Downward Total	16637	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	16637	100%

ISOFOOT CANDLE PLOT



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UR20

ARCHITECTURAL AREA/SITE

PHOTOMETRY

UR20-56L-140-4K7-4

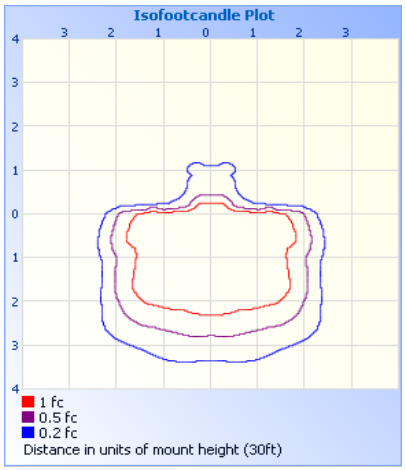
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**16722**
Watts	**140**
Efficacy	**119.4**
IES Type	**IV**
BUG Rating	**B1-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15112	90.4%
Downward House Side	1610	9.6%
Downward Total	16722	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	16722	100%

ISOFOOT CANDLE PLOT



UR20-56L-140-4K7-4W

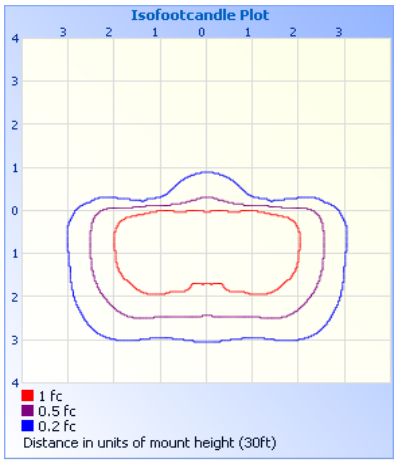
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17033**
Watts	**138**
Efficacy	**123.4**
IES Type	**IV**
BUG Rating	**B2-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15040	88.3%
Downward House Side	1993	11.7%
Downward Total	17033	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17033	100%

ISOFOOT CANDLE PLOT



UR20-56L-140-4K7-5QM

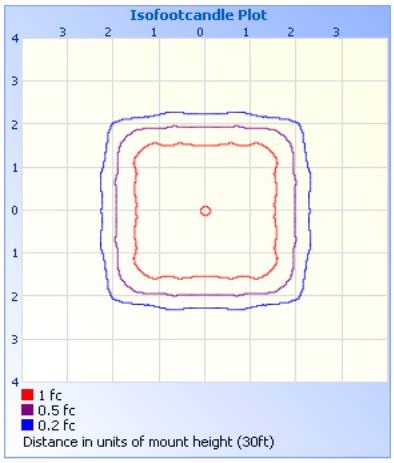
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17354**
Watts	**140**
Efficacy	**124.0**
IES Type	**VS**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8677	50.0%
Downward House Side	8677	50.0%
Downward Total	17354	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17354	100%

ISOFOOT CANDLE PLOT



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UR20

ARCHITECTURAL AREA/SITE

PHOTOMETRY

UR20-56L-140-4K7-5QN

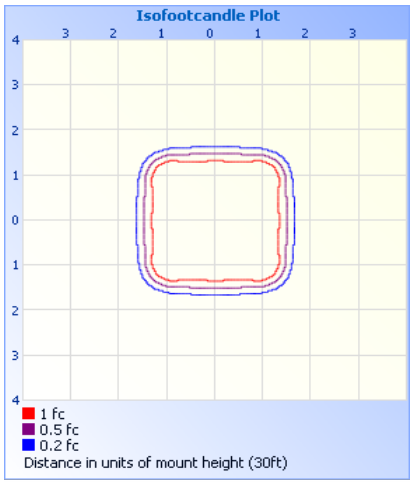
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18023**
Watts	**140**
Efficacy	**128.7**
IES Type	**VS**
BUG Rating	**B4-U0-G1**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9012	50.0%
Downward House Side	9012	50.0%
Downward Total	18023	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18023	100%

ISOFOOT CANDLE PLOT



UR20-56L-140-4K7-5R

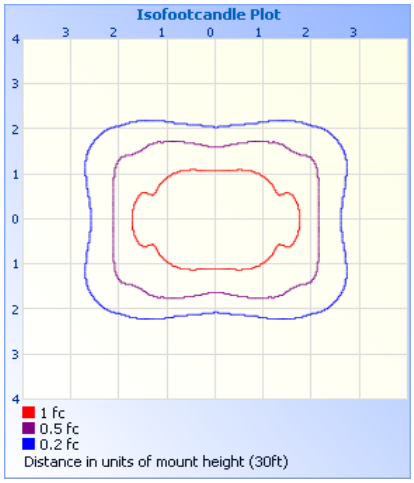
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17201**
Watts	**140**
Efficacy	**122.9**
IES Type	**III**
BUG Rating	**B4-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8601	50.0%
Downward House Side	8601	50.0%
Downward Total	17201	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17201	100%

ISOFOOT CANDLE PLOT



UR20-56L-140-4K7-5W

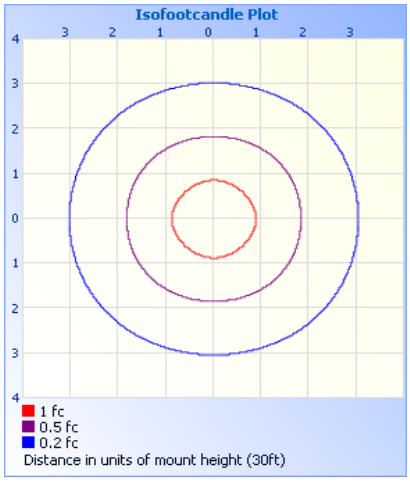
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17014**
Watts	**140**
Efficacy	**121.5**
IES Type	**III**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8507	50.0%
Downward House Side	8507	50.0%
Downward Total	17014	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17014	100%

ISOFOOT CANDLE PLOT



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HUBBELL Lighting

KIM LIGHTING

DATE: LOCATION:

TYPE: PROJECT:

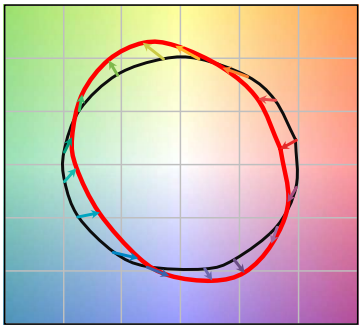
CATALOG #:

UR20

ARCHITECTURAL AREA/SITE

TM-30 DATA

COLOR VECTOR GRAPHIC

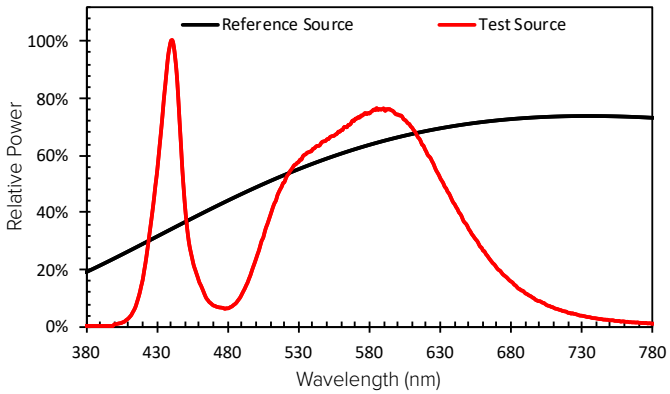


Reference Illuminant — Test Source

TEST SOURCE

R_f	68
R_g	99
CCT(K)	3947
D_{UV}	0.0004
x	0.3831
y	0.3793
CIE R_a	72

SPECTRAL POWER DISTRIBUTION COMPARISON



ELECTRICAL DATA

Drive Current	LED Count	System Watts	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming				
			VAC	Hz	120	208	240	277	347	480			Dimming Range	Source current out of 0-10V		Absolute voltage range on 0-10V (+)	
														Min	Max	Min	Max
298mA	24	25	120-480	50/60	0.21	0.12	0.10	0.09	0.07	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
298mA	28	30			0.25	0.14	0.13	0.11	0.09	0.06							
800mA	24	65			0.54	0.31	0.27	0.23	0.19	0.14							
700mA	28	70			0.58	0.34	0.29	0.25	0.20	0.15							
420mA	56	75			0.63	0.36	0.31	0.27	0.22	0.16							
350mA	68	80			0.67	0.38	0.33	0.29	0.23	0.17							
600mA	56	110			0.92	0.53	0.46	0.40	0.32	0.23							
500mA	68	115			0.96	0.55	0.48	0.42	0.33	0.24							
750mA	56	140			1.17	0.67	0.58	0.51	0.40	0.29							
625mA	68	150			1.25	0.72	0.63	0.54	0.43	0.31							

TM-21 Lifetime Calculation - Projected Lumen Maintenance (25°C / 77°C)						
Ambient Temp.	0	25,000	36,000	50,000	100,000	Reported L70
25°C / 77°F	100%	97%	95%	93%	87%	60khrs

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HUBBELL Lighting

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

Altitude®

FEATURES

- Elegant form factor
- High performance optics up to 17,500 delivered lumens
- Diffusion lens for low glare comfort
- NX™ wireless control options



c UL us LISTED

3000K and warmer CCTs only

CONTROL TECHNOLOGY

NX DISTRIBUTED INTELLIGENCE

RELATED PRODUCTS

Ouro Pavilion PGL8

SPECIFICATIONS

CONSTRUCTION

- One piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 with vents and .100" minimum wall thickness
- Separate internal driver compartment rated for IP66 ingress protection
- Finish: fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) polyester powdercoat
- Standard colors include (BLS) Black Gloss Smooth, (BLT) Black Matte Textured, (DBS) Dark Bronze Gloss Smooth, (GTT) Graphite Matte Textured, (LGS) Light Gray Gloss Smooth, (PSS) Platinum Silver Smooth, (VGS) Verde Green Smooth, (WH) White, and (CC) Custom Color (Include RAL#)
- Lens is impact resistant 1/8" tempered glass with anti-reflective coating
- Lens has a one-piece extruded vulcanized silicone gasket
- Lens frame one piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 and .100" minimum wall thickness
- Lens frame has a one-piece O-ring extruded vulcanized silicone gasket
- Mid-frame one piece die-cast, low copper (<0.6% Cu) Aluminum Alloy 360 and .100" minimum wall thickness
- Mid-frame secures to Lens Frame and housing by stainless steel recessed Allen-head screws
- Silicone gaskets throughout
- All external fasteners are stainless steel

OPTICS

- LEDs mount to a metal printed circuit board assembly (MCPCB)
- Optical lenses are clear injection molded PMMA acrylic

INSTALLATION

- Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury

ELECTRICAL

- Universal voltage, 120 through 277V with a ±10% tolerance. Driver is Underwriters Laboratories recognized
- High voltage configurations, 347/480. Driver has a 0-10V dimming interface for multi-level illumination options. Driver is Underwriters Laboratories recognized
- "Thermal Shield", secondary side, thermistor provides protection for the sustainable life of LED module and electronic components
- Drivers shall have greater than a 0.9 power factor, less than 20% harmonic distortion, and be suitable for operation in -40°C to 40°C ambient environments
- Luminaire shall be capable of operating at 100% brightness in a 40°C environment. Both driver and optical array have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C

ELECTRICAL (CONTINUED)

- Dimming range from 10% to 100% through the use of standard 0-10V interface on the programmable driver
- Modular wiring harness in the service area provides user access to the dimming circuitry
- Optional factory programmed dimming profile
- Surge protection: 10,000k in parallel, 20,000k in series
- SF for 120, 277, 347 Line volts
  DF for 208, 240, 480 Line volts
- Wiring: No. 18AWM rated 105°C, wet rating.

CERTIFICATIONS AND LISTINGS

- UL 1598 Standard for Luminaires
- IP66 certified
- RoHS compliant

WARRANTY

- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Lumen Range	1,673–18,452
Wattage Range	22–156
Efficacy Range (LPW)	56–137
Reported Life (Hours)	L70/60,000
Weight	21.5 lbs 9.75 kg
EPS Front View / Side View	.37 / .64

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HUBBELL Lighting

KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

ORDERING GUIDE

Example: ALT1-54L-120-3K8-3-UNV-A34-GT-NXSPW30F-CLR

CATALOG #

HOUSING

ALT1

Housing		LED Engine		CCT/CRI		Distribution		Rotation		Voltage	
ALT1	Architectural Area/Site	**28L-20**	20W, 3,000 lm	**AM**	Amber[9]	**FR**	Type I/Front Row		Blank for no rotation	**UNV**	Universal 120–277V
		28L-40	40W, 5,000 lm	**3K7**	3000K, 70 CRI	**2**	Type II	**L**	Optic rotation left[1]	**347**	347V
		28L-60	60W, 7,500 lm	**3K8**	3000K, 80 CRI	**3**	Type III	**R**	Optic rotation right[1]	**480**	480V
		28L-85	85W, 10,000 lm	**3K9**	3000K, 90 CRI	**4**	Type IV				
		54L-95	95W, 12,500 lm	**4K7**	4000K, 70 CRI	**4W**	Type IV Wide				
		54L-120	120W, 15,000 lm	**4K8**	4000K, 80 CRI	**5QM**	Type V Square Medium				
		54L-155	155W, 17,500 lm	**5K7**	5000K, 70 CRI	**5QN**	Type V Square Narrow				
				5K8	5000K, 80 CRI	**5R**	Type V Rectangular				
						5W	Type V Wide (Round)				

Mounting		Fixture Finish		Control Options		Options		Control Accessories	
ASQ	Arm Square pole	**BL**	Black	**7PR**	7 pin PCR, wireless control enabled	**BC**	Backlight Control[6]	**SCPREMOTE**	Remote control for SCP option. Order at least one per project to program and control the occupancy sensor
A34	Arm mt 3.3–4.2" OD pole	**DB**	Dark Bronze	**7PR-TL**	7 pin PCR with twist lock photocontrol	**SF**	Single Fuse	**SW7PR**	SiteSync™ on fixture module via 7PR
A46	Arm mt 4.5–6.0" OD pole	**GT**	Graphite	**7PR-SC**	7 pin PCR with shorting cap	**DF**	Double Fuse	**SWUSB**	SiteSync™ Software on USB
MAF	Horizontal Slipfitter 2.375" OD arm	**LG**	Light Grey	**AD-012**	AstroDIM: 50% output at midnight[10]	**TB**	Terminal Block	**SWTAB**	SiteSync™ Windows Tablet[8]
SVSF	Vertical Slipfitter Mount square for 2" pipe tenon, (2.375" OD)	**PS**	Platinum Silver	**AD-022**	AstroDIM: 50% output midnight to 4 AM[10]	**CLR**	Clear Lens	**SWBRG**	SiteSync™ Wireless Bridge Node
VSF	Vertical Slipfitter Mount for 2" pipe tenon, (2.375" OD)	**TT**	Titanium	**AD-032**	AstroDIM: 50% output 10PM[10]	**HDL**	Diffuse Lens[7]	**SWFC**	SiteSync™ Field Commission Service
WB	Wall Bracket for area wall mount	**WH**	White	**AD-042**	AstroDIM: 50% output 10PM to 4AM[10]			**WIR-RME-L**	wiSCAPE™ External Fixture Module
		CC	Custom Color[2]	**NXSP14F**	Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' [3,4]			**NXOFM-1R1D-UNV**	NX External Contol Node
				NXSP30F	Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' [3,4]				
				NXSPW14F	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' [3,4]				
				NXSPW30F	NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' [3,4]				
				NXWE	NX Wireless Enabled				
				SCL-8F	Low voltage sensor for 3rd party wireless controls via 7PR. For mounting heights up to 8'				
				SCL-40F	Low voltage sensor for 3rd party wireless controls via 7PR. For mounting heights 9' to 40'				
				SCP-8F	Remote control programable line voltage sensor, use with SCPREMOTE				
				SCP-40F	Remote control programable line voltage sensor, use with SCPREMOTE				
				SWP	Site Sync™ Pre Commission Wireless Module[3,4,5]				
				SWPM-40F	Site Sync with Sensor 9' to 40' MH[3,4,5]				

Notes:

1 Not available with 5QM and 5W distributions

2 Consult factory

3 Not available with other sensor or wireless control options

4 Not available in 480V

5 Specify group and zone at time of order, See www.hubbelllighting.com/sitesync for more details. Order at least one SiteSync interface accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node

6 Not available with Type 5 distributions, CLR, or HDL option

7 Only available in Type 3 or Type 5W

8 Microsoft, Encarta, MSN, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries

9 Wildlife friendly

10 Not available for 28L-20 engine and sensor options

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KIM LIGHTING®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

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PRODUCT EXCEPTIONS & DETAILS

Configuration			EPA
	1SA	1 Arm Side Mount	0.98
	2SB	2 Arm Side Mount	1.48
	2SL	2 Arm Side Mount	1.96
	3ST	3 Arm Side Mount	2.20

Configuration			EPA
	3SY*	3 Arm Side Mount	2.46
	4SC	4 Arm Side Mount	2.46
	1W	Single Wall Mount	n/a
	HSF	Horizontal Slipfitter	n/a

DELIVERED LUMENS

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	20	3,000	No Lens	FR	3110	0	0	0	141	3274	0	0	0	149	3318	1	0	0	148
				FR-BC	2036	0	0	0	93	2143	0	0	0	97	2172	0	0	0	97
				2	2903	1	0	1	132	3056	1	0	1	139	3097	1	0	1	138
				2-BC	1771	0	0	0	80	1864	0	0	0	85	1889	0	0	0	84
				3	2945	1	0	1	131	3100	1	0	1	138	3141	1	0	1	140
				3-BC	1779	0	0	1	81	1873	0	0	1	85	1898	0	0	1	85
				4	2943	0	0	1	134	3098	0	0	1	141	3139	0	0	1	141
				4-BC	2189	0	0	1	100	2304	0	0	1	105	2335	0	0	1	104
				4W	2927	1	0	1	133	3081	1	0	1	140	3122	1	0	1	139
				4W-BC	1673	0	0	1	76	1761	0	0	1	80	1785	0	0	1	80
				5R	3025	2	0	2	137	3184	2	0	2	145	3227	2	0	2	144
				5QM	3069	2	0	0	139	3230	2	0	0	147	3273	2	0	0	146
				5QN	3051	2	0	0	139	3211	2	0	0	146	3254	2	0	0	145
				5W	3024	2	0	1	137	3183	2	0	1	145	3226	2	0	1	144
			Clear Lens	FR	2909	0	0	0	132	3062	0	0	0	139	3103	0	0	0	141
				2	2715	1	0	1	123	2858	1	0	1	130	2896	1	0	1	132
				3	2754	1	0	1	125	2899	1	0	1	132	2938	1	0	1	134
				4	2752	0	0	1	125	2897	0	0	1	132	2936	0	0	1	133
				4W	2738	1	0	1	124	2882	1	0	1	131	2920	1	0	1	133
				5R	2829	2	0	2	129	2978	2	0	2	135	3018	2	0	2	137
				5QM	2870	2	0	0	130	3021	2	0	0	137	3062	2	0	0	139
				5QN	2853	2	0	0	130	3003	2	0	0	137	3044	2	0	0	138
				5W	2829	2	0	1	129	2977	2	0	1	135	3017	2	0	1	137
			HDL Lens	3	2341	1	0	1	106	2464	1	0	1	112	2497	1	0	1	114
				5W	2405	1	0	1	109	2531	1	0	1	115	2565	1	0	1	117

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	40	5,000	No Lens	FR	4870	1	0	0	128	5127	1	0	0	135	5195	1	0	0	137
				FR-BC	3189	0	0	0	84	3356	0	0	0	88	3401	0	0	0	90
				2	4546	1	0	1	120	4785	1	0	1	126	4849	1	0	1	128
				2-BC	2773	0	0	1	73	2919	0	0	1	77	2958	0	0	1	78
				3	4611	1	0	2	121	4854	1	0	2	128	4919	1	0	2	129
				3-BC	2786	0	0	1	73	2933	0	0	1	77	2972	0	0	1	78
				4	4608	1	0	2	121	4851	1	0	2	128	4915	1	0	2	129
				4-BC	3428	0	0	1	90	3608	0	0	1	95	3656	0	0	1	96
				4W	4584	1	0	2	121	4825	1	0	2	127	4889	1	0	2	129
				4W-BC	2621	0	0	1	69	2758	0	0	1	73	2795	0	0	1	74
				5R	4737	2	0	2	125	4986	3	0	1	131	5053	3	0	3	133
				5QM	4806	2	0	1	126	5058	2	0	1	133	5126	2	0	1	135
				5QN	4777	2	0	0	126	5028	2	0	0	132	5096	2	0	0	134
				5W	4736	3	0	1	125	4985	2	0	2	131	5052	3	0	1	133
			Clear Lens	FR	4555	1	0	0	120	4795	1	0	0	126	4859	1	0	0	128
				2	4252	1	0	1	112	4476	1	0	1	118	4536	1	0	1	119
				3	4333	1	0	1	114	4561	1	0	1	120	4622	1	0	1	121
				4	4310	0	0	2	113	4537	1	0	2	119	4598	1	0	2	121
				4W	4287	1	0	2	113	4513	1	0	2	119	4573	1	0	2	120
				5R	4431	2	0	2	117	4663	2	0	2	123	4726	2	0	2	124
				5QM	4495	2	0	1	118	4731	2	0	1	125	4794	2	0	1	126
				5QN	4468	2	0	0	118	4703	2	0	0	124	4766	2	0	0	125
				5W	4430	3	0	1	117	4663	3	0	1	123	4725	3	0	1	124
			HDL Lens	3	3741	1	0	1	98	3937	1	0	1	104	3990	1	0	1	105
				5W	3891	2	0	1	102	4095	2	0	1	108	4150	2	0	1	109

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	60	7,500	No Lens	FR	7347	1	0	1	122	7733	1	0	1	129	7837	1	0	1	131
				FR-BC	4810	0	0	0	80	5063	0	0	0	84	5131	0	0	0	86
				2	6858	1	0	2	114	7218	1	0	2	120	7315	1	0	2	122
				2-BC	4183	0	0	1	70	4403	0	0	1	73	4462	0	0	1	74
				3	6956	1	0	2	116	7322	1	0	2	122	7420	1	0	2	123
				3-BC	4203	0	0	1	70	4424	0	0	1	74	4483	0	0	1	75
				4	6951	1	0	2	116	7317	1	0	2	122	7415	1	0	2	124
				4-BC	5171	0	0	2	86	5443	0	0	2	91	5516	0	0	2	92
				4W	6915	1	0	2	115	7278	1	0	2	121	7376	1	0	2	123
				4W-BC	3953	0	0	2	66	4161	0	0	2	69	4216	0	0	2	70
				5R	7145	3	0	3	119	7521	3	0	3	125	7622	3	0	3	127
				5QM	7249	3	0	1	121	7630	3	0	1	127	7732	3	0	1	129
				5QN	7206	3	0	0	120	7585	3	0	0	126	7687	3	0	0	128
				5W	7144	3	0	2	119	7520	3	0	2	125	7620	3	0	2	127
			Clear Lens	FR	6872	1	0	1	115	7233	1	0	1	121	7330	1	0	1	122
				2	6414	1	0	2	107	6751	1	0	2	113	6842	1	0	2	114
				3	6506	1	0	2	108	6848	1	0	2	114	6940	1	0	2	116
				4	6502	1	0	2	108	6844	1	0	2	114	6935	1	0	2	116
				4W	6468	1	0	2	108	6807	1	0	2	113	6899	1	0	2	115
				5R	6683	3	0	3	111	7035	3	0	3	117	7129	3	0	3	119
				5QM	6780	3	0	1	113	7137	3	0	1	119	7232	3	0	1	121
				5QN	6740	2	0	0	112	7094	3	0	0	118	7189	3	0	0	120
				5W	6682	3	0	2	111	7033	3	0	2	117	7128	3	0	2	119
			HDL Lens	3	5531	2	0	1	92	5821	2	0	1	97	5899	2	0	1	98
				5W	5680	2	0	1	95	5979	2	0	1	100	6059	2	0	1	101

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
28L	85	10,000	No Lens	FR	9699	1	0	1	113	10209	1	0	1	119	10346	1	0	1	120
				FR-BC	6350	0	0	1	74	6684	0	0	1	78	6773	0	0	1	79
				2	9054	1	0	2	105	9530	2	0	2	111	9657	2	0	2	112
				2-BC	5523	0	0	1	64	5813	0	0	1	68	5891	0	0	1	68
				3	9183	1	0	2	107	9666	1	0	2	112	9795	1	0	2	114
				3-BC	5549	0	0	2	65	5841	0	0	2	68	5919	0	0	2	69
				4	9177	1	0	2	107	9660	1	0	2	112	9789	1	0	2	114
				4-BC	6827	0	0	2	79	7186	0	0	2	84	7282	0	0	2	85
				4W	9129	1	0	3	106	9609	1	0	3	112	9737	1	0	3	113
				4W-BC	5219	0	0	2	61	5493	0	0	2	64	5567	0	0	2	65
				5R	9433	3	0	3	110	9929	3	0	3	115	10062	3	0	3	117
				5QM	9570	3	0	1	111	10073	3	0	1	117	10208	3	0	1	119
				5QN	9514	3	0	0	111	10014	3	0	0	116	10148	3	0	0	118
				5W	9432	4	0	2	110	9927	4	0	2	115	10060	4	0	2	117
			Clear Lens	FR	9072	1	0	1	105	9549	1	0	1	111	9677	1	0	1	113
				2	8468	1	0	2	98	8913	1	0	2	104	9033	1	0	2	105
				3	8589	1	0	2	100	9041	1	0	2	105	9162	1	0	2	107
				4	8584	1	0	2	100	9035	1	0	2	105	9156	1	0	2	106
				4W	8538	1	0	2	99	8987	1	0	3	105	9108	1	0	3	106
				5R	8823	3	0	3	103	9287	3	0	3	108	9411	3	0	3	109
				5QM	8951	3	0	1	104	9422	3	0	1	110	9548	3	0	1	111
				5QN	8898	3	0	0	103	9366	3	0	0	109	9491	3	0	0	110
				5W	8822	3	0	2	103	9285	4	0	2	108	9410	4	0	2	109
			HDL Lens	3	7302	2	0	2	85	7685	2	0	2	89	7788	2	0	2	91
				5W	7499	2	0	1	87	7893	2	0	1	92	7999	2	0	1	93

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	95	12,500	No Lens	FR	11792	1	0	1	125	12412	1	0	1	132	12578	1	0	1	134
				FR-BC	7848	0	0	1	83	8260	0	0	1	88	8371	0	0	1	90
				2	11210	2	0	2	119	11800	2	0	2	126	11958	2	0	2	126
				2-BC	5993	0	0	1	64	6308	0	0	1	67	6392	0	0	1	69
				3	11225	1	0	2	119	11815	2	0	2	126	11974	2	0	2	127
				3-BC	6273	0	0	2	67	6603	0	0	2	70	6691	0	0	2	72
				4	11311	1	0	2	120	11906	1	0	3	127	12065	1	0	3	128
				4-BC	7291	0	0	2	78	7674	0	0	2	82	7777	0	0	2	84
				4W	11203	2	0	3	119	11792	2	0	3	125	11950	2	0	3	127
				4W-BC	5603	0	0	2	60	5898	0	0	2	63	5977	0	0	2	65
				5R	11623	3	0	3	124	12234	3	0	3	130	12398	3	0	3	131
				5QM	11770	3	0	2	125	12389	3	0	2	132	12555	3	0	2	133
				5QN	11799	3	0	0	126	12420	3	0	0	132	12586	3	0	0	133
				5W	11594	4	0	2	123	12204	4	0	2	130	12367	4	0	2	131
			Clear Lens	FR	11029	1	0	1	117	11609	1	0	1	124	11765	1	0	1	125
				2	10485	2	0	2	112	11036	2	0	2	117	11184	2	0	2	119
				3	10555	1	0	2	112	11110	1	0	2	118	11259	1	0	2	120
				4	10579	1	0	2	113	11136	1	0	2	118	11285	1	0	2	120
				4W	10479	1	0	3	111	11029	2	0	3	117	11177	2	0	3	119
				5R	10871	3	0	3	116	11443	3	0	3	122	11596	3	0	3	123
				5QM	11009	3	0	2	117	11588	3	0	2	123	11743	3	0	2	125
				5QN	11036	3	0	0	117	11616	3	0	0	124	11772	3	0	0	125
				5W	10845	4	0	2	115	11415	4	0	2	121	11568	4	0	2	123
			HDL Lens	3	8736	2	0	2	93	9195	2	0	2	98	9318	2	0	2	100
				5W	9152	3	0	1	97	9633	3	0	1	102	9762	3	0	1	104

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DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	120	15,000	No Lens	FR	14390	1	0	1	118	15146	1	0	1	124	15349	1	0	1	125
				FR-BC	9577	1	0	1	78	10080	1	0	1	83	10215	1	0	1	84
				2	13680	2	0	2	112	14399	2	0	2	118	14592	2	0	2	120
				2-BC	7313	0	0	1	60	7697	0	0	2	63	7800	0	0	2	64
				3	13698	2	0	3	112	14418	2	0	3	118	14611	2	0	3	120
				3-BC	7655	0	0	2	63	8057	0	0	2	66	8165	0	0	2	67
				4	13803	1	0	3	113	14528	1	0	3	119	14723	1	0	3	121
				4-BC	8897	0	0	2	73	9365	0	0	2	77	9490	0	0	2	78
				4W	13671	2	0	3	112	14390	2	0	3	118	14583	2	0	4	120
				4W-BC	6838	1	0	2	56	7197	1	0	2	59	7294	1	0	2	60
				5R	14184	4	0	4	116	14929	4	0	4	122	15129	4	0	4	124
				5QM	14363	3	0	2	118	15118	4	0	2	124	15321	4	0	2	126
				5QN	14399	4	0	4	118	15156	4	0	1	124	15359	4	0	1	126
				5W	14149	4	0	2	116	14893	4	0	2	122	15092	4	0	2	124
			Clear Lens	FR	13459	1	0	1	110	14167	1	0	1	116	14356	1	0	2	118
				2	12795	2	0	2	105	13468	2	0	2	110	13648	2	0	2	112
				3	12812	2	0	2	105	13486	2	0	2	111	13666	2	0	2	112
				4	12910	1	0	3	106	13589	1	0	3	111	13771	1	0	3	113
				4W	12787	2	0	3	105	13459	2	0	3	110	13640	2	0	3	112
				5R	13266	4	0	4	109	13964	4	0	4	114	14151	4	0	4	116
				5QM	13434	3	0	2	110	14140	3	0	2	116	14330	3	0	2	117
				5QN	13467	4	0	0	110	14175	4	0	0	116	14365	4	0	0	118
				5W	13234	4	0	2	108	13929	4	0	2	114	14116	4	0	2	116
			HDL Lens	3	10892	3	0	2	89	11464	3	0	2	94	11618	3	0	2	95
				5W	11250	3	0	1	92	11841	3	0	2	97	12000	3	0	2	98

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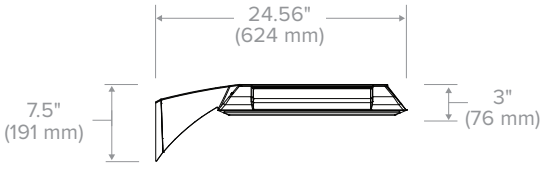
DELIVERED LUMENS (CONTINUED)

LEDs #	Nominal Watts	Nominal Lumens	Lens Options	Distribution	3000K 70CRI					4000K 70CRI					5000K 70CRI				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
54L	155	17,500	No Lens	FR	17299	2	0	2	111	18208	2	0	2	117	18452	2	0	2	119
				FR-BC	11513	1	0	1	74	12118	1	0	1	78	12280	1	0	1	79
				2	16445	2	0	2	105	17310	2	0	3	111	17542	2	0	3	112
				2-BC	8791	0	0	2	56	9253	0	0	2	59	9377	0	0	2	60
				3	16467	2	0	3	106	17333	2	0	3	111	17565	2	0	3	113
				3-BC	9202	1	0	2	59	9686	1	0	2	62	9816	1	0	2	63
				4	16593	1	0	3	106	17465	1	0	3	112	17699	1	0	4	113
				4-BC	10696	0	0	2	69	11258	1	0	2	72	11409	1	0	2	73
				4W	16435	2	0	4	105	17299	2	0	4	111	17531	2	0	4	112
				4W-BC	8220	1	0	2	53	8652	1	0	2	55	8768	1	0	2	56
				5R	17051	4	0	4	109	17947	4	0	4	115	18188	4	0	4	117
				5QM	17267	4	0	2	111	18174	4	0	2	117	18418	4	0	2	118
				5QN	17309	4	0	1	111	18219	4	0	1	117	18463	4	0	1	118
				5W	17009	4	0	2	109	17903	4	0	2	115	18143	4	0	2	116
			Clear Lens	FR	16180	1	0	2	104	17030	1	0	2	109	17258	1	0	2	111
				2	15382	2	0	2	99	16190	2	0	2	104	16407	2	0	2	105
				3	15402	2	0	3	99	16212	2	0	3	104	16429	2	0	3	105
				4	15520	1	0	3	99	16336	1	0	3	105	16555	1	0	3	106
				4W	15372	2	0	4	99	16180	2	0	4	104	16397	2	0	4	105
				5R	15948	4	0	4	102	16787	4	0	4	108	17011	4	0	4	109
				5QM	16150	4	0	2	104	16999	4	0	2	109	17227	4	0	2	110
				5QN	16190	4	0	1	104	17041	4	0	1	109	17269	4	0	1	111
				5W	15909	4	0	2	102	16745	4	0	2	107	16969	4	0	2	109
			HDL Lens	3	13093	3	0	2	84	13782	3	0	2	88	13966	3	0	2	90
				5W	13524	3	0	2	87	14235	3	0	2	91	14426	3	0	2	92

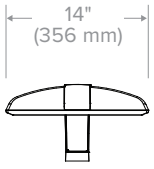
CRI Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

Amber Multiplier	
CCT	Multiplier
5000K	1
AM	0.1727

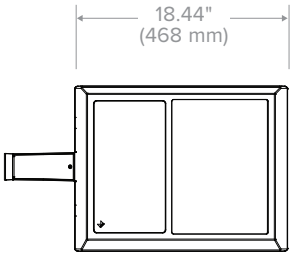
DIMENSIONS



Side View



Front View



Top View

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TYPE: PROJECT:

CATALOG #:

ALT1

ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-FR

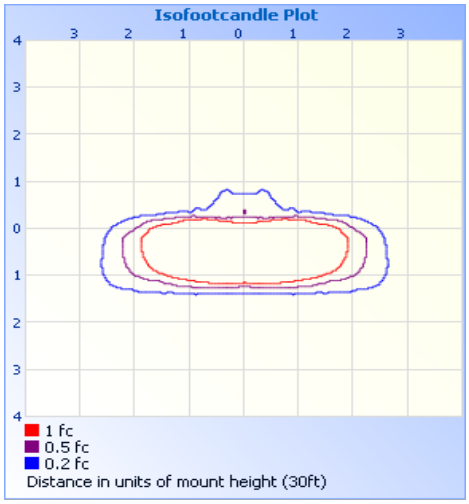
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18208**
Watts	**156**
Efficacy	**116.7**
IES Type	**I**
BUG Rating	**B2-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	16101	88.4%
Downward House Side	2107	11.6%
Downward Total	18208	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18208	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-2

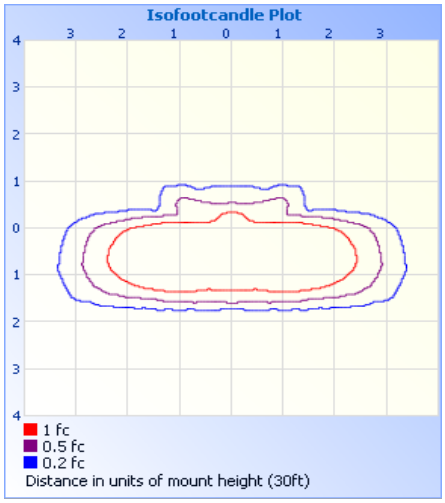
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17309**
Watts	**156**
Efficacy	**111.0**
IES Type	**II**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14323	82.7%
Downward House Side	2986	17.3%
Downward Total	17309	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17309	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-3

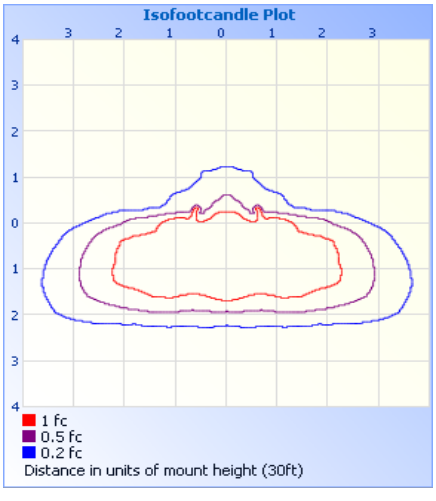
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17332**
Watts	**156**
Efficacy	**111.1**
IES Type	**III**
BUG Rating	**B2-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	14911	86.0%
Downward House Side	2421	14.0%
Downward Total	17332	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17332	100%

ISOFOOT CANDLE PLOT



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ALT1

ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-4

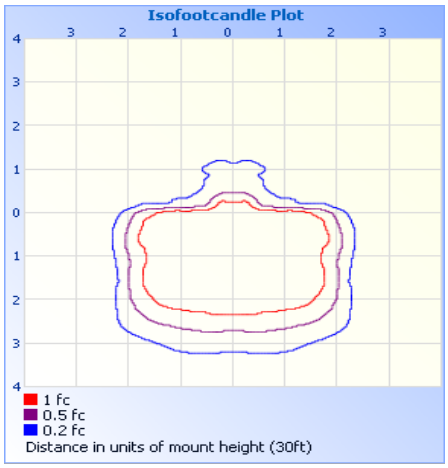
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17465**
Watts	**156**
Efficacy	**112.0**
IES Type	**IV**
BUG Rating	**B1-U0-G3**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15757	90.2%
Downward House Side	1708	9.8%
Downward Total	17465	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17465	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-4W

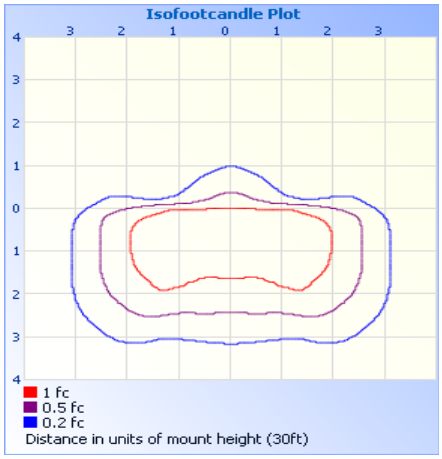
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17299**
Watts	**156**
Efficacy	**110.9**
IES Type	**IV**
BUG Rating	**B2-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	15320	88.6%
Downward House Side	1979	11.4%
Downward Total	17299	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17299	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5R

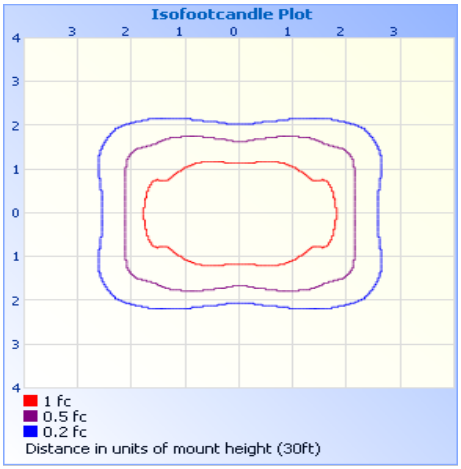
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17947**
Watts	**156**
Efficacy	**115.0**
IES Type	**III**
BUG Rating	**B4-U0-G4**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8974	50.0%
Downward House Side	8974	50.0%
Downward Total	17947	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17947	100%

ISOFOOT CANDLE PLOT



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ALT1

ARCHITECTURAL AREA/SITE

PHOTOMETRY

ALT1-54L-155-4k7-5QM

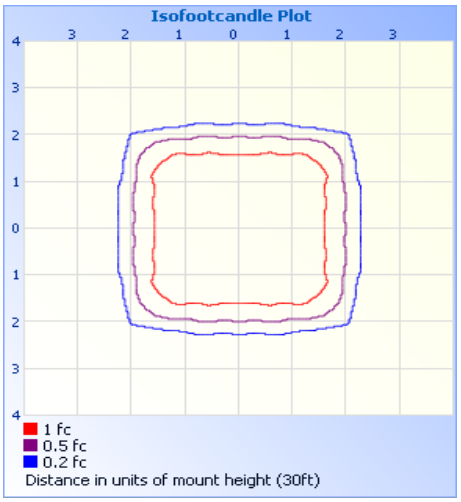
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18173**
Watts	**156**
Efficacy	**116.5**
IES Type	**V**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9087	50.0%
Downward House Side	9087	50.0%
Downward Total	18173	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18173	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5QN

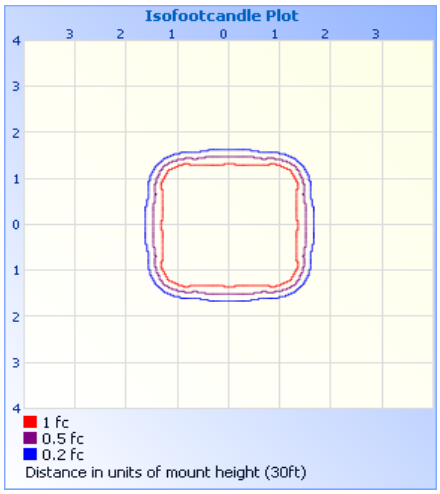
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**18219**
Watts	**156**
Efficacy	**116.8**
IES Type	**V**
BUG Rating	**B4-U0-G1**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	9110	50.0%
Downward House Side	9110	50.0%
Downward Total	18219	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	18219	100%

ISOFOOT CANDLE PLOT



ALT1-54L-155-4k7-5W

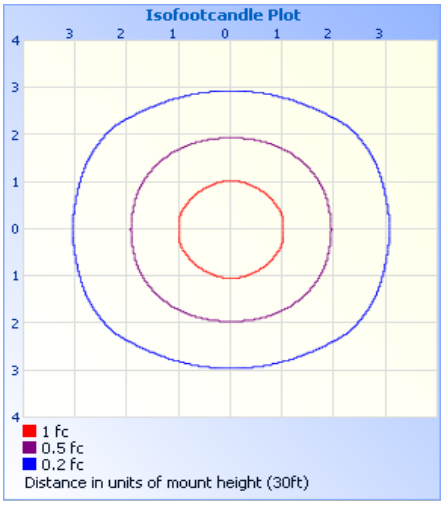
LUMINAIRE DATA

Description	**4000K, 70CRI**
Delivered Lumens	**17904**
Watts	**156**
Efficacy	**114.8**
IES Type	**V**
BUG Rating	**B4-U0-G2**
Mounting Height	**30 ft**
Grid Scale	**30 ft**

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
Downward Street Side	8952	50.0%
Downward House Side	8952	50.0%
Downward Total	17904	100%
Upward Street Side	0	0%
Upward House Side	0	0%
Upward Total	0	0%
Total Flux	17904	100%

ISOFOOT CANDLE PLOT



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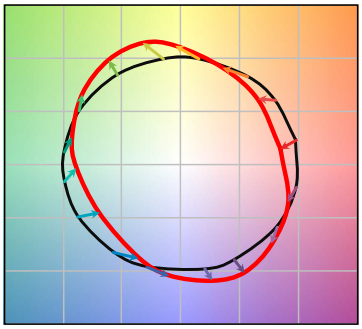
ARCHITECTURAL AREA/SITE

TM-30 DATA

COLOR VECTOR GRAPHIC

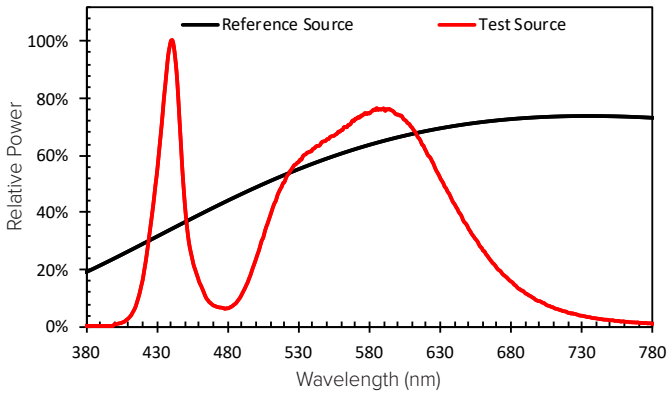


Reference Illuminant — Test Source

TEST SOURCE

R_f	68
R_g	99
CCT(K)	3947
D_{UV}	0.0004
x	0.3831
y	0.3793
CIE R_a	72

SPECTRAL POWER DISTRIBUTION COMPARISON



ELECTRICAL DATA

Electrical													Dimming			
# LED	System Watts	Drive Current	Line Voltage		Amps AC						Min. Power Factor	Max THD (%)	Dimming Range	Source current out of 0-10V		Absolute voltage range on 0-10V (+)	
			VAC	Hz	120	208	240	277	347	480				Min	Max	Min	Max
28	22	250 mA	120-480	50/60	0.18	0.11	0.09	0.08	0.06	0.05	>0.9	20	10% to 100%	0mA	1mA	0V	10V
	38	400 mA			0.32	0.18	0.16	0.14	0.11	0.08							
	60	650 mA			0.50	0.29	0.25	0.22	0.17	0.13							
	86	950 mA			0.72	0.41	0.36	0.31	0.25	0.18							
54	94	550 mA			0.78	0.45	0.39	0.34	0.27	0.20							
	122	700 mA			1	0.59	0.51	0.44	0.35	0.25							
	156	900 mA			1.30	0.75	0.65	0.56	0.45	0.33							

TM-21 Lifetime Calculation - Projected Lumen Maintenance (25°C / 77°C)						
Hours	0	25,000	36,000	50,000	100,000	Reported L70
Projected Lumen Maintenance	100%	96.9%	95.3%	93.3%	86.6%	> 60,000

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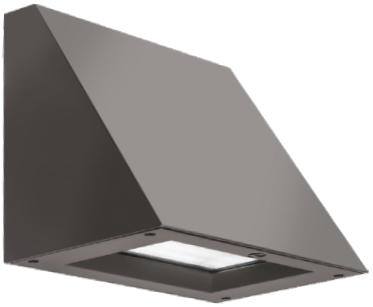


WDGE2 LED
Architectural Wall Sconce

Catalog Number

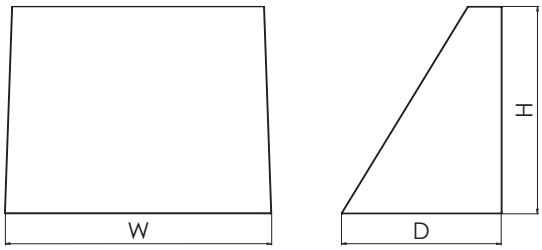
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth: 7″
Height: 9″
Width: 11.5″
Weight: (without options) 13.5 lbs



Introduction

The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.

WDGE2 delivers up to 6,000 lumens with a soft, non-pixelated light source, creating a visually comfortable environment. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

WDGE LED Family Overview

Luminaire	Standard EM, 0°C	Cold EM, -20°C	Sensor	Lumens (4000K)					
				P1	P2	P3	P4	P5	P6
WDGE1 LED	4W	--	--	1,200	2,000	--	--	--	--
WDGE2 LED	10W	18W	Standalone / nLight	1,200	2,000	3,000	4,500	6,000	--
WDGE3 LED	15W	18W	Standalone / nLight	7,500	8,500	10,000	12,000	--	--
WDGE4 LED	--	--	Standalone / nLight	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI VF MVOLT DDBXD

Series	Package		Color Temperature		CRI	Distribution		Voltage	Mounting	
WDGE2 LED	P1[1]	P1SW	27K	2700K	80CRI	VF	Visual comfort forward throw	MVOLT	**Shipped included**	**Shipped separately**
	P2[1]	P2SW	30K	3000K	90CRI	VW	Visual comfort wide	347[3]	SRM Surface mounting bracket	AWS 3/8inch Architectural wall spacer
	P3[1]	P3SW	35K	3500K				480[3]		BBW Surface-mounted back box
	P4[1]	Door with small window (SW) is required to accommodate sensors. See page 2 for more details.	40K	4000K						PBBW Premium surface-mounted back box (top, left, right conduit entry)
	P5[1]		50K[2]	5000K						

Options

E4WH	Emergency battery backup, CEC compliant (4W, 0°C min)
E10WH	Emergency battery backup, CEC compliant (10W, 5°C min)
E20WC	Emergency battery backup, CEC compliant (18W, -20°C min)
PE[4]	Photocell, Button Type
DS[5]	Dual switching (comes with 2 drivers and 2 light engines; see page 3 for details)
DMG[6]	0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)
BCE	Bottom conduit entry for premium back box (PBBW). Total of 4 entry points.

Standalone Sensors/Controls (only available with P1SW, P2SW & P3SW)

PIR	Bi-level (100/35%) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching.
PIRH	Bi-level (100/35%) motion sensor for 15-30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching
PIR1FC3V	Bi-level (100/35%) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation.
PIRH1FC3V	Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation.

Networked Sensors/Controls (only available with P1SW, P2SW & P3SW)

NLTAIR2 PIR	nLightAIR Wireless enabled bi-level motion/ambient sensor for 8-15' mounting heights.
NLTAIR2 PIRH	nLightAIR Wireless enabled bi-level motion/ambient sensor for 15-30' mounting heights.

See page 4 for out of box functionality

Finish

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DSSXD	Sandstone
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white
DSSTXD	Textured sandstone

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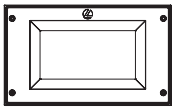
Accessories

Ordered and shipped separately.

WDGEAWS DDBXD U	WDGE 3/8inch Architectural Wall Spacer (specify finish)
WDGE2PBBW DDBXD U	WDGE2 Premium surface-mounted back box (specify finish)
WSBBW DDBXD U	Surface - mounted back box (specify finish)

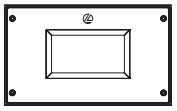
NOTES

1 P1-P5 not available with sensors/controls. Sensors/controls only available with P1SW, P2SW and P3SW.
2 50K not available in 90CRI
3 347V and 480V not available with E4WH, E10WH, E20WC or DS.
4 PE not available in 480V or with sensors/controls
5 DS option not available with E4WH, E10WH, E20WC or sensors/controls.
6 DMG option not available with sensors/controls



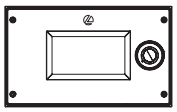
Default configuration with no sensors/controls.

Power Packages: P1, P2, P3, P4, P5



Small Window (SW) configuration

Power Packages: P1SW, P2SW, P3SW



Configuration with sensors/controls

Power Packages: P1SW, P2SW, P3SW

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Dist. Type	27K (2700K, 80 CRI)		30K (3000K, 80 CRI)		35K (3500K, 80 CRI)		40K (4000K, 80 CRI)		50K (5000K, 80 CRI)	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
P1 / P1SW	10W	VF	1,166	119	1,209	123	1,251	128	1,256	128	1,254	128
		VW	1,197	122	1,241	126	1,284	131	1,289	131	1,286	131
P2 / P2SW	15W	VF	1,878	129	1,947	134	2,015	139	2,023	139	2,019	139
		VW	1,927	133	1,997	137	2,067	142	2,075	143	2,071	143
P3 / P3SW	23W	VF	2,908	129	3,015	134	3,119	138	3,132	139	3,126	139
		VW	2,983	132	3,093	137	3,200	142	3,213	143	3,206	142
P4	35W	VF	4,096	117	4,247	121	4,394	126	4,412	126	4,403	126
		VW	4,202	120	4,357	125	4,508	129	4,526	129	4,517	129
P5	48W	VF	5,567	115	5,772	119	5,972	123	5,996	124	5,984	124
		VW	5,711	118	5,921	122	6,127	126	6,151	127	6,139	127

Electrical Load

Performance Package	System Watts	Current (A)					
		120V	208V	240V	277V	347V	480V
P1 / P1SW	10W	0.082	0.049	0.043	0.038	--	--
	13W	--	--	--	--	0.046	0.033
P2 / P2SW	15W	0.132	0.081	0.072	0.064	--	--
	18W	--	--	--	--	0.056	0.041
P3 / P3SW	23W	0.195	0.114	0.100	0.088	--	--
	26W	--	--	--	--	0.079	0.058
P4	35W	0.302	0.175	0.152	0.134	--	--
	38W	--	--	--	--	0.115	0.086
P5	48W	0.434	0.241	0.211	0.184	--	--
	52W	--	--	--	--	0.157	0.119

Lumen Multiplier for 90CRI

CCT	Multiplier
27K	0.845
30K	0.867
35K	0.845
40K	0.885
50K	0.898

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.96	>0.95	>0.91

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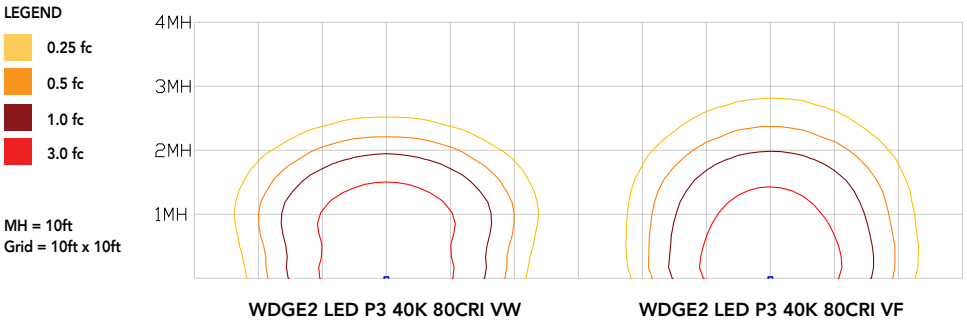
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WDGE LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.



WDGE2 LED P3 40K 80CRI VW

WDGE2 LED P3 40K 80CRI VF

Emergency Egress Options

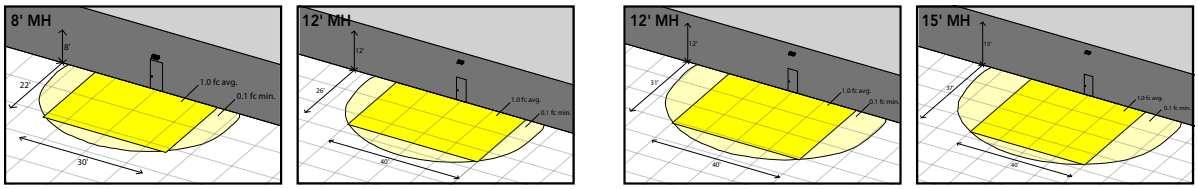
Emergency Battery Backup

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency battery backup configurations include an independent secondary driver with an integral relay to immediately detect loss of normal power and automatically energize the luminaire. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time normal power is lost and maintain a minimum of 60% of the light output at the end of 90minutes.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9

The examples below show illuminance of 1 fc average and 0.1 fc minimum in emergency mode with E10WH or E20WC and VF distribution.

Grid = 10ft x 10ft



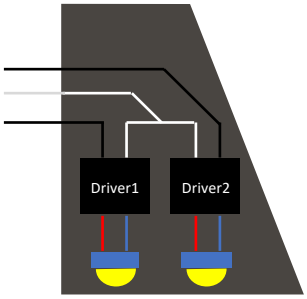
WDGE2 LED xx 40K 80CRI VF MVOLT E10WH

WDGE2 LED xx 40K 80CRI VF MVOLT E20WC

Dual Switching (DS) Option

The dual switching option offers operational redundancy that certain codes require. With this option the luminaire comes integrated with two drivers and two light engines. These work completely independent to each other so that a failure of any individual component does not cause the whole luminaire to go dark. This option is typically used with a back generator or inverter providing emergency power.

Applicable codes: NFPA 70/NEC – section 700.16, NFPA 101 Life Safety Code Section 7.9



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Control / Sensor Options

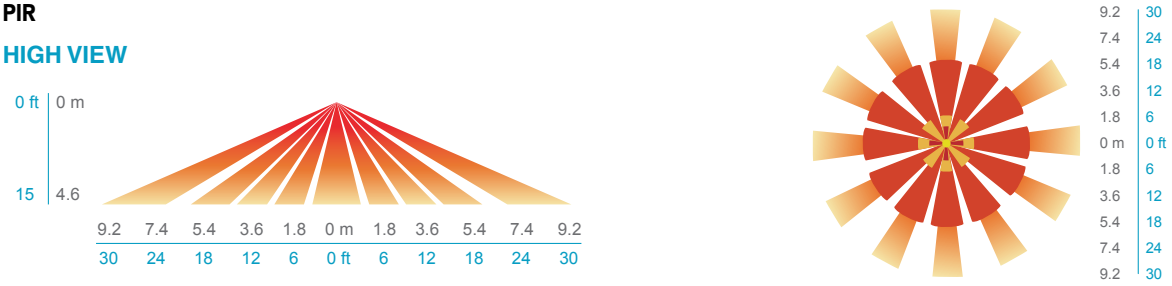
Motion/Ambient Sensor (PIR_, PIRH_)

Motion/Ambeint sensor (Sensor Switch MSOD) is integrated into the the luminaire. The sensor provides both Motion and Daylight based dimming of the luminaire. For motion detection, the sensor utilizes 100% Digital Passive Infrared (PIR) technology that is tuned for walking size motion while preventing false tripping from the environment. The integrated photocell enables additional energy savings during daytime periods when there is sufficient daylight. Optimize sensor coverage by either selecting PIR or PIRH option. PIR option comes with a sensor lens that is optimized to provide maximum coverage for mounting heights between 8-15ft, while PIRH is optimized for 15-40ft mounting height.

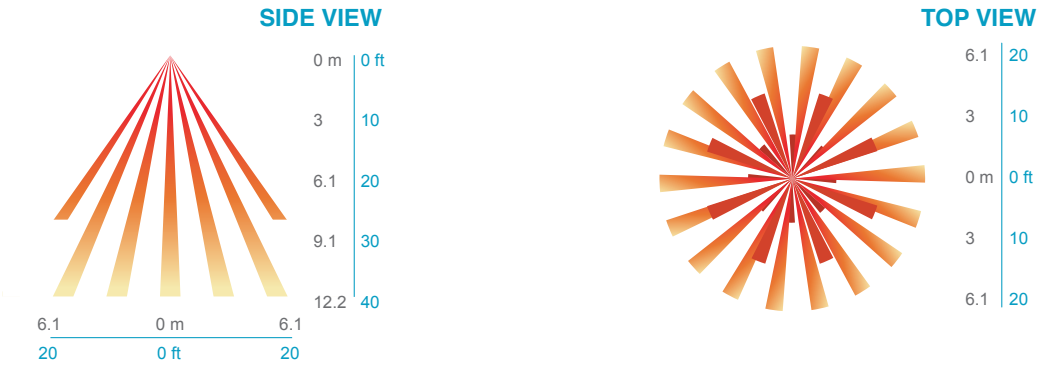
Networked Control (NLTAIR2)

nLight® AIR is a wireless lighting controls platform that allows for seamless integration of both indoor and outdoor luminaires. Five-tier security architecture, 900 MHz wireless communication and app (CLAIRITY™ Pro) based configurability combined together make nLight® AIR a secure, reliable and easy to use platform.

PIR



PIRH



Option	Dim Level	High Level (when triggered	Photocell Operation	Motion Time Delay	Ramp-down Time	Ramp-up Time
PIR or PIRH	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
PIR1FC3V, PIRH1FC3V	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 1fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
NLTAIR2 PIR, NLTAIR2 PIRH (out of box)	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	7.5 min	5 min	Motion - 3 sec Photocell - 45 sec

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Mounting, Options & Accessories



NLTAIR2 PIR – nLight AIR Motion/Ambient Sensor

D = 7″

H = 11″

W = 11.5″

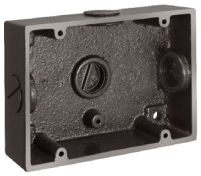


PBBW – Premium Back Box

D = 1.75″

H = 9″

W = 11.5″



BBW – Standard Back Box

D = 1.5″

H = 4″

W = 5.5″



AWS – 3/8inch Architectural Wall Spacer

D = 0.38″

H = 4.4″

W = 7.5″

FEATURES & SPECIFICATIONS

INTENDED USE
Common architectural look, with clean rectilinear shape, of the WDGE LED was designed to blend with any type of construction, whether it be tilt-up, frame or brick. Applications include commercial offices, warehouses, hospitals, schools, malls, restaurants, and other commercial buildings.

CONSTRUCTION
The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP66 rating for the luminaire.

FINISH
Exterior painted parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS
Well crafted reflector optics allow the light engine to be recessed within the luminaire, providing visual comfort, superior distribution, uniformity, and spacing in wall-mount applications. The WDGE LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L91/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire comes with built in 6kV surge protection, which meets a minimum Category C low exposure (per ANSI/IEEE C62.41.2).

INSTALLATION
A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The 3/8″ Architectural Wall Spacer (AWS) can be used to create a floating appearance or to accommodate small imperfections in the wall surface.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP66 rated. PIR options are rated for wet location. Rated for -40°C minimum ambient.
DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY
5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/support/customer-support/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

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University of Southern Maine
Career and Student Success Center & Residence Hall

Stormwater Management Report
Revised July 24, 2020

Applicant:

University of Southern Maine
Bedford Street
Portland, Maine 04101

Submitted by:

SMRT, Inc.
Architecture Engineering Planning
144 Fore Street / P.O. Box 618
Portland, Maine 04104

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APPENDICES

Appendix A-1 **Pre and Post Development Watershed Plans**
Appendix A-2 **HydroCad Runoff and Routing Calculations**
Appendix A-3 **Water Quality Plan and Calculations**
Appendix A-4 **Stormwater System Maintenance Plan**
Appendix A-5 **Preliminary Geotechnical Report, S.W. Cole, Jan. 28, 2020**

Appendix A-6 FEMA Firm Map

1.0 PROJECT DESCRIPTION

The University of Southern Maine (USM) is proposing to construct two new capital buildings on approximately 3.6 acres of the Portland campus of the University of Southern Maine. The project is known as the Career and Student Success Center & Residence Hall project. The project area is bounded by the easterly corner of the block defined by Falmouth, Durham, and Bedford Streets. This area presently includes a large public parking lot, the Woodbury Student Center (approx. 21,701 sf), the Facilities Management building (8,950 sf), and associated service areas, parking, and infrastructure. This project will remove all features in the project area. Essential services, infrastructure, and offices will be relocated on campus prior to commencing demolition.

The project will replace the Woodbury Center with an updated and properly-sized student activity center to be known as the Career Student Success Center (CSSC). The CSSC will be an approximately 27,000 sf building with two stories to accommodate multiple campus uses including dining, bookstore, student activities, formal mass gathering, and informal collaboration spaces. The new residence hall has been sited on the corner of Durham and Bedford Streets to establish a prominent, singular structure that will improve the campus gateway image. The building will be approximately 32,500 sf in a “C” shape with wings of 5 and 8 stories and provide housing for approximately 571 students in multiple dwelling unit layouts.

The project watershed is presently developed with no natural resource areas remaining. The existing topography generally slopes easterly toward the corner of Bedford and Durham Streets. The new buildings have been sited to generally maintain and compliment the existing topography of the project area. All runoff from the site is currently and will continue to be collected by storm drain structures of the City system in Bedford and Durham Streets. There are no surface drainage discharge locations from this project watershed.

Based on a geotechnical investigation, the subsurface soil conditions at the site typically consist of uncontrolled fill overlying glaciomarine sand, silt, and clay. Bedrock was typically encountered at 5 to 26 feet below grade. Groundwater was encountered at depths ranging from 8 to 16 feet. The majority of the mapped surficial soils are stiff, silty clary which is most commonly classified as Hydrologic Type C soils. A Geotechnical Evaluation of the proposed property has been prepared by S.W. Cole Engineering, Inc. and is included within the Appendix of this report.

2.0 STORM WATER NARRATIVE

2.1 Site Location

The project area is bounded by the easterly corner of the block defined by Falmouth, Durham, and Bedford Streets. The site is presently developed as a higher education campus with

buildings, paved areas, and landscaped areas. There are no areas of natural resources remaining on the site.

2.2 Receiving Waters

The Portland campus is located in the Back Cove watershed. Runoff from the site presently drains to the City storm drain system in Bedford Street and flows northerly to discharge into Back Cove. This area is not identified as part of an Urban Impaired Stream watershed by MDEP or the City of Portland.

2.3 Historic Flooding

There is no evidence of historical flooding on the project site. FEMA Flood Insurance Rate Map (Community Panel Number 2300510013B) dated July 17, 1986 indicates that no portion of the project area is within the floodplain associated with Back Cove.

2.4 Alterations to Natural Drainage Ways

Drainage characteristics will remain relatively the same from the pre to the post development condition. No alterations to natural drainage ways are proposed as part of this project.

2.5 Methodology and Modeling Assumptions

Runoff and routing calculations have been performed for the watershed areas affected by the proposed development under pre-development and post-development conditions scenarios. Times of concentration and runoff curve number calculations have been performed using the method described in Natural Resource Conservation Service (NRCS) Technical Release 55 (TR-55) – Urban Hydrology for Small Watersheds. The TR-20 based HydroCad modeling software has been utilized to perform the more complex runoff and routing calculations, some of which are beyond the scope of the TR-55 method. Time of concentration calculations have been amended where the value given by the TR-55 method is less than five minutes. In these cases a standard minimum value of five minutes has been used to keep this parameter within the acceptable working range of the model and prevent computational errors.

Design rainfall events have been modeled using the SCS Type III hydrograph for 24-hour duration storms. The rainfall depth for each return period is taken from Chapter 500, Stormwater Management, Appendix H. The rainfall values for standard design storm frequencies are shown in the table below.

24-Hour Rainfalls for Cumberland County SE at Design Storm Frequencies				
Chapter 500, Stormwater Management, Appendix H				
Frequency	2-Year	10-Year	25-Year	100-Year
Rainfall Depth	3.1 in	4.6 in	5.8 in	8.1 in

The onsite soils have been generally identified as Hydrologic Group C through geotechnical investigation. The existing topography of the site was determined by field survey and existing surface covers were identified by site inspection.

Stormwater BMPs have been designed to effectively capture, detain and treat runoff from developed areas of the site before allowing it to discharge in a non-erosive manner to downstream areas. The Maine Best Management Practices Manual (current edition on-line) and the Maine Erosion and Sediment Control Best Management Practices Manual for Designers and Engineers (current edition on-line) have been used as guidelines in the design of the storm water system.

2.6 Permitting Requirements

The proposed project area is part of a previously approved Site Location of Development Act permit for the Portland campus. The project is not in a lake watershed nor is it in an Urban Impaired Stream watershed and as such will not be required to meet the Phosphorus Standard or the Urban Impaired Stream Standards.

Per Chapter 500 standards, the project will be required to meet the Basic and General Standards, and the site was analyzed under the Redevelopment Treatment standard to identify the treatment target. The project was also analyzed for the flooding standard to provide stormwater quantity control for the 2-year, 10-year, 25-year storm events. The 100-year storm event was also analyzed to determine the resulting impacts.

Redevelopment Treatment Standard.

The project meets the definition of a redevelopment project and a pollutant ranking calculation was performed by the standard to determine the treatment required. For a project area of approximately 157,971 sf, the calculation is as follows:

Pollutant Ranking	Pre Development Area (sf)	Pre-Development Ranking
5	0	0.00
4	87532	8.04
3	424	0.03
2	67840	3.12
1	2175	0.05
	Total: 157971	**Weighted Average: 3.10**

Pollutant Ranking	Post Development Area (sf)	Post-Development Ranking
5	0.00	0.00
4	11194	1.03
3	0.00	0.00
2	139474	6.40
1	7303	0.17
	Total: 157971	**Weighted Average: 2.10**

The proposed project results in a significant increase in building footprint, though there is a significant decrease in medium intensity parking area. The existing impact ranking is 3.1 and the proposed impact ranking is 2.1. This provides a net balance of -1.00. Per Table 3 of Chapter 500, the treatment level for this redevelopment project is 50% or approximately 78,986 sf.

Developed Area

The project area meeting the developed area definition is approximately 165,175 sf, including the area of the residence hall, CSSC, service area, lawn and landscape areas, and associated features. See C-122 Water Quality Plan.

Treatment Target
For a 50% redevelopment treatment, the target is to treat a minimum of 82,588 sf.

2.7 Proposed BMPs

The stormwater management system for this development is intended to provide effective water quality and quantity control/treatment for new development areas and to protect downstream stormwater infrastructure and natural resources from potential detrimental impacts. The site layout allows adequate area for surface filtration-style features. The following treatment BMPs were selected from Section 7.1 of the Maine Best Management Practices Manual.

A. Grassed Underdrained Soil Filters

Three grassed underdrained soil filters are proposed to meet the treatment goal from the developed area associated with the project. The roof areas of the new buildings provide a direct flow of runoff for treatment and roof drains will discharge directly to inlet control structures in each soil filter. The water quality volume is based on 1" of runoff from the tributary impervious area and 0.4" of runoff from the tributary landscaped areas.

B. BioRetention Cell Soil Filters

Three grassed underdrained soil filters are proposed to meet the treatment goal from the developed area associated with the project. The roof areas of the new buildings provide a direct flow of runoff for treatment and roof drains will discharge directly to inlet control structures in each soil filter. The water quality volume is based on 1" of runoff from the tributary impervious area and 0.4" of runoff from the tributary landscaped areas.

C. Total Developed Area Treated

The total developed area treated by the five features is as follows:

Feature	Developed Area Treated	Developed Area (sf)
VFF 1	Courtyard Areas	14,050
VFF 2	Dorm roof, site pavement and lawn areas	11,496
VFF 3	CSSC Roof, site pavement and lawn areas	34,500
BRC 1	Dorm Roof	10,548
BRC 2	Dorm Roof	10,000
	Total Area	**80,594 sf**
	Treatment Target	**78,986 sf**

The treatment target is met by the proposed design.

2.8 Existing BMPs Impacted by Proposed Development

There are no existing BMPs impacted by the Proposed Development.

2.9 Project Impacts

The development of this project will result in the reduction of approximately 1.16 acres (50,706 sf) of impervious area. The project will construct multi-story buildings to replace two one-story buildings with a lower intensity of use. The project will also create two significant vegetated areas to support the general campus population and the dormitory population. A "Quad" of lawn area will be created where an existing parking lot is presently, and a courtyard of lawn area will be created for the dorm where existing buildings are presently. These conditions will result in less impervious area. Another condition that reduces project impacts is that this parcel is drained in multiple locations to the City storm drain system in Durham and Bedford Streets. These drainage patterns are preserved in the post development condition and represents multiple flows that are reduced in the post development condition. The new stormwater management system is designed to provide water quality treatment through the use of the three vegetated soil filters. The focus of the design is on source control of pollutants and the prevention of erosive velocities to downstream receiving areas. The stormwater calculations demonstrate that the system will achieve the pollutant removal efficiency required by State and local regulations, maintains the existing drainage patterns of the site to a high degree, and the runoff from all areas will be similar to the site conditions before development.

3.0 STORM WATER QUANTITY ANALYSIS

The project area presently discharges to the City of Portland storm drain system in both Bedford and Durham Streets. The change in impervious area is approximately 1.0 acres which will significantly reduce the peak flow and volume of stormwater runoff from the project area. The impact to the City storm drain system will likely be an increase in its available capacity such that it is likely that downstream conditions will be improved as a result of the project.

Pre-Development Conditions

For pre-development conditions scenario, the site is divided into four subcatchment areas, representing runoff to Bedford Street, Durham Street, roof runoff to Bedford Street, and roof runoff to Durham Street. The analysis point for this model is a hypothetical point downstream of the drain manhole at the intersection of Durham and Bedford Streets.

A. Subcatchment 1S

Subcatchment 1S represents the northerly half of the project area adjacent to Sullivan Hall and the community garden. This area drains in an easterly direction to the City storm drain system in Durham Street.

B. Subcatchment 2S

Subcatchment 2S represents the southerly half of the project area adjacent to Masterton Hall and the Woodbury Center. This area drains southerly direction to the City storm drain system in Bedford Street.

C. Subcatchment #25

Subcatchment #25 represents the roof area of the Facilities Management building at #25 Bedford Street. The roof drains directly to the City storm drain system in Durham Street.

D. Subcatchment #35

Subcatchment #35 represents the roof area of the Woodbury Center building at #35 Bedford Street. The roof drains directly to the City storm drain system in Bedford Street.

The pre-development subcatchment areas, cover conditions, and time of concentration flow paths are described in detail in the supporting HydroCAD documentation included in the Appendix A-1 of this report. A Pre-Development Conditions Watershed Plan (C-120) is included.

Post-Development Conditions

For the post–development conditions, the site is developed with the two new buildings, new grassed Quad, grassed courtyard, and associated features and landscaping.

A. Subcatchment 1S

Subcatchment 1S represents the northerly half of the project area adjacent to Sullivan Hall and the community garden. This area drains in an easterly direction to the City storm drain system in Durham Street. The subcatchment was modified to show a reduced area as a result of construction of the CSSC (Subcatchments Dorm1, Dorm 2, Dorm 3, Dorm 4, Dorm 5, and CTYRD).

B. Subcatchment 2S

represents the southerly half of the project area adjacent to Masterton Hall and the Woodbury Center. This area drains southerly direction to the City storm drain system in Bedford Street DP-3. The subcatchment was modified to show a reduced area as a result of construction of the CSSC (Subcatchment CSSC).

C. Subcatchment Dorm1

Subcatchment Dorm1 represents roof runoff from the residence hall, which will be treated by a bioretention cell (BRC1) along the Durham facade.

D. Subcatchment Dorm 2

Subcatchment Dorm2 represents roof runoff from the residence hall, which will be treated by a vegetated soil filter(VFF2) near the Central Heating building.

E. Subcatchment CTYRD

Subcatchment CTYRD represents the courtyard area including lawn and hardscape areas, which will be treated by a vegetated soil filter (VFF3) in the courtyard.

F. Subcatchment CSSC

Subcatchment CSSC represents the SCCS roof runoff, which will be treated by a vegetated soil filter (VFF3) adjacent to the building.

G. Subcatchment Dorm 3

Subcatchment Dorm represents roof runoff from the residence hall, which will be treated by a bioretention cell (BRC2) along the westerly façade of the building.

H. Subcatchment Dorm 4

Subcatchment Dorm 4 represents roof runoff from the residence hall, which will not be treated and will drain to the Durham Street storm drain system.

I. Subcatchment Dorm 5

Subcatchment Dorm 5 represents roof runoff from the residence hall, which will not be treated and will drain to the Durham Street storm drain system.

Stormwater Modeling

HydroCAD software (based on TR-20 methods) was utilized to model the change in stormwater runoff to the City storm drain system for pre and post conditions. It is noted that the model was not intended to model the actual flow conditions in the storm drain system, but rather identify the change(s) in runoff inflow to the system. This model approach should provide a result that shows the flooding standard has been met by reducing the amount of runoff from the project area and consequently creating new capacity in the City storm drain for future flows. The point of analysis for the comparison was a fictional point downstream of the drain manhole (i.d. 1834) at the corner of Bedford and Durham. The model was prepared to reflect changes in surface conditions which is the most significant factor affecting peak flow rates between the two conditions. The presence of treatment features (vegetated filter fields) was also modeled and had a minor influence in attenuating the peak flows for the post development condition. A summary of the pre-development versus post-development conditions runoff rates is as follows:

Peak Flows to City Storm Drain System in CFS				
Storm Event	**Pre-Development (cfs)**	**Post Development (cfs)**	**Net (cfs)**	**Percentage**
2 yr storm	10.14	5.58	-4.56	-45%
10 yr storm	16.21	9.83	-6.38	-39%
25 yr storm	21.05	15.19	-5.86	-28%
100 yr storm	30.19	27.54	-2.65	-9%

Storm Drain Conveyance

The site storm drain system has generally been designed to convey a 10 year Storm Event. The culvert outlets from the vegetated soil filters have been designed to convey that value at a minimum (using Manning's Equation), with planned additional capacity for larger storm events.

10 Year Storm Event for Vegetated Soil Filters		
Outlet Culvert	**Peak Flow (cfs)**	**Storm Drain Design Capacity ***
VFF 1	0.09	15" dia.; 5.47 cfs min. (two culverts for redundancy
VFF 2	0.08	12" dia.; 2.98 cfs min.
VFF 3	0.30	12" dia.; 2.98 cfs min.
BRC1	0.23	12" dia.; 2.98 cfs min.
BRC2	0.97	12" dia.; 2.98 cfs min.

* Min. slope = 0.005, Manning's n = 0.011

4.0 MAINTENANCE

A comprehensive Maintenance Plan has been developed for the Stormwater Best Management Practices for this facility. A copy of the Plan is included in Appendix A-4.

5.0 CONCLUSIONS

The runoff and routing calculations demonstrate that the development will result in a reduction in the peak rate of runoff for the 2-year, 10-year, 25-year, and 100-year return periods.

Water quality treatment is provided that meets redevelopment standards for new developed areas associated with the project. Three vegetated soil filters provide treatment for greater than 50% of the developed area which meets the Chapter 500 treatment requirements for redevelopment.

6.0 REFERENCES

- Maine Stormwater Management Design Manual Volume III BMP Technical Design Manual, current edition on-line.

- Maine Erosion and Sediment Control Best Management Practices Manual for Designers and Engineers, current edition on-line.

- Preliminary Geotechnical Engineering Services, Proposed Residential Hall & Student Success Center, prepared by S.W. Cole Engineering, Inc., January 28, 2020.

Appendix A-1 Pre and Post Development Watershed Plans



REV	DESCRIPTION	DATE

ISSUED FOR SD AND PERMITTING
3-6-20

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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PRE-DEVELOPMENT WATERSHED PLAN

SHEET TITLE:

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	C-120-19206	SHEET No.	C-120

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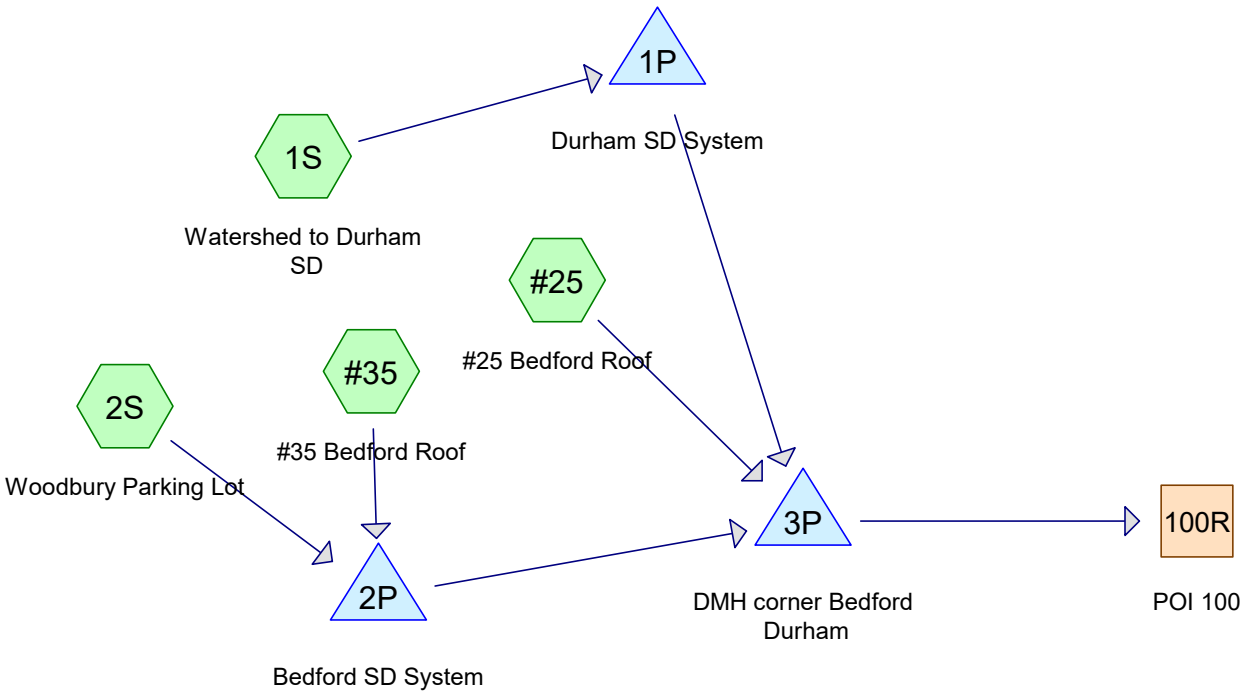
24x36

Appendix A-2 **HydroCAD Runoff and Routing Calculations**



Subcat Reach Pond Link

Routing Diagram for 19206 Ex Cond
Prepared by SMRT, Printed 3/4/2020
HydroCAD® 10.00-24 s/n 00729 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.097	74	>75% Grass cover, Good, HSG C (1S, 2S)
3.480	98	Paved parking, HSG A (#25, #35, 1S, 2S)
4.577	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
3.480	HSG A	#25, #35, 1S, 2S
0.000	HSG B	
1.097	HSG C	1S, 2S
0.000	HSG D	
0.000	Other	
4.577		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.097	0.000	0.000	1.097	>75% Grass cover, Good	1S, 2S
3.480	0.000	0.000	0.000	0.000	3.480	Paved parking	#25, #35, 1S, 2S
3.480	**0.000**	**1.097**	**0.000**	**0.000**	**4.577**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	22.53	13.35	300.0	0.0306	0.009	24.0	0.0	0.0
2	2P	21.90	13.35	300.0	0.0285	0.009	36.0	0.0	0.0
3	3P	13.35	11.00	200.0	0.0117	0.014	24.0	0.0	0.0

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment #25: #25 Bedford Roof Runoff Area=8,950 sf 100.00% Impervious Runoff Depth>2.68"
Tc=5.0 min CN=98 Runoff=0.62 cfs 0.046 af

Subcatchment #35: #35 Bedford Roof Runoff Area=27,201 sf 100.00% Impervious Runoff Depth>2.68"
Tc=5.0 min CN=98 Runoff=1.89 cfs 0.140 af

Subcatchment 1S: Watershed to Durham Runoff Area=53,341 sf 62.15% Impervious Runoff Depth>1.86"
Tc=10.0 min CN=89 Runoff=2.45 cfs 0.190 af

Subcatchment 2S: Woodbury Parking Lot Runoff Area=109,883 sf 74.87% Impervious Runoff Depth>2.12"
Tc=10.0 min CN=92 Runoff=5.64 cfs 0.447 af

Reach 100R: POI 100 Inflow=10.14 cfs 0.822 af
Outflow=10.14 cfs 0.822 af

Pond 1P: Durham SD System Peak Elev=23.18' Storage=6 cf Inflow=2.45 cfs 0.190 af
24.0" Round Culvert n=0.009 L=300.0' S=0.0306 '/' Outflow=2.46 cfs 0.190 af

Pond 2P: Bedford SD System Peak Elev=22.91' Storage=7 cf Inflow=7.20 cfs 0.586 af
36.0" Round Culvert n=0.009 L=300.0' S=0.0285 '/' Outflow=7.20 cfs 0.586 af

Pond 3P: DMH corner Bedford Durham Peak Elev=14.81' Storage=13 cf Inflow=10.14 cfs 0.822 af
24.0" Round Culvert n=0.014 L=200.0' S=0.0117 '/' Outflow=10.14 cfs 0.822 af

Total Runoff Area = 4.577 ac Runoff Volume = 0.822 af Average Runoff Depth = 2.16"
23.98% Pervious = 1.097 ac 76.02% Impervious = 3.480 ac

Summary for Subcatchment #25: #25 Bedford Roof

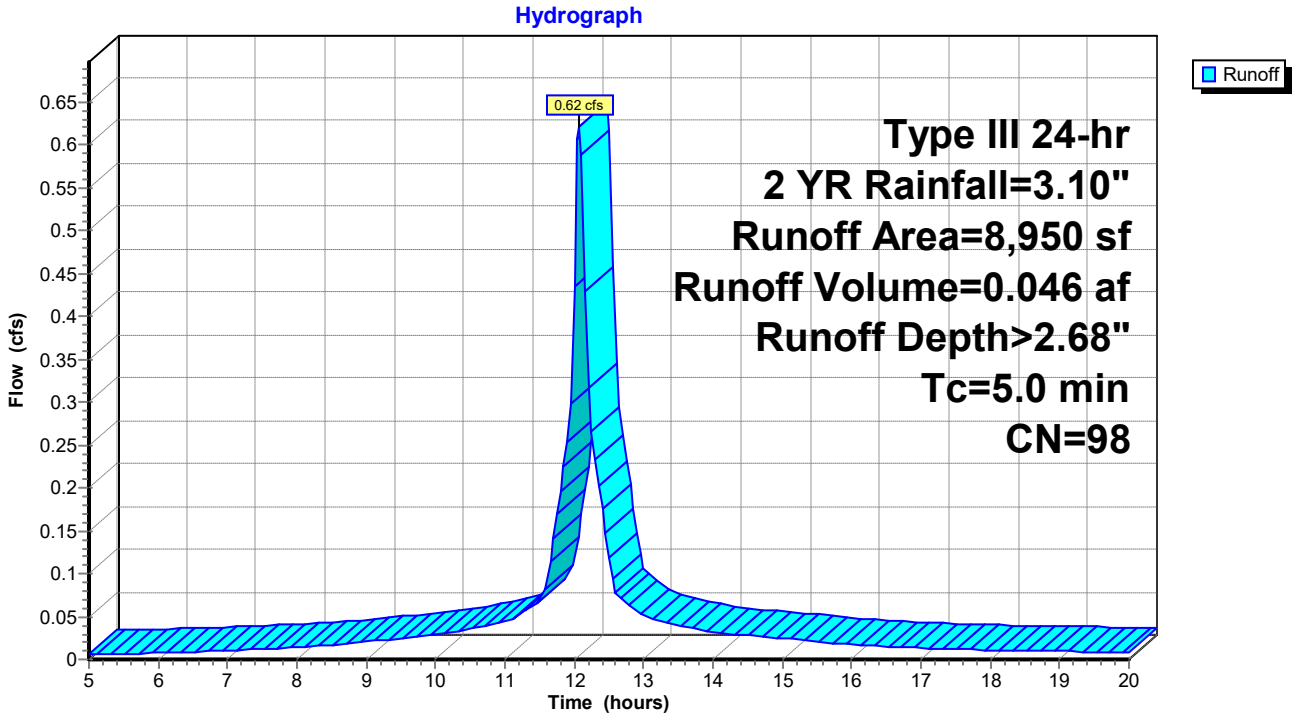
Runoff = 0.62 cfs @ 12.07 hrs, Volume= 0.046 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

Area (sf)	CN	Description
8,950	98	Paved parking, HSG A
8,950		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #25: #25 Bedford Roof



Summary for Subcatchment #35: #35 Bedford Roof

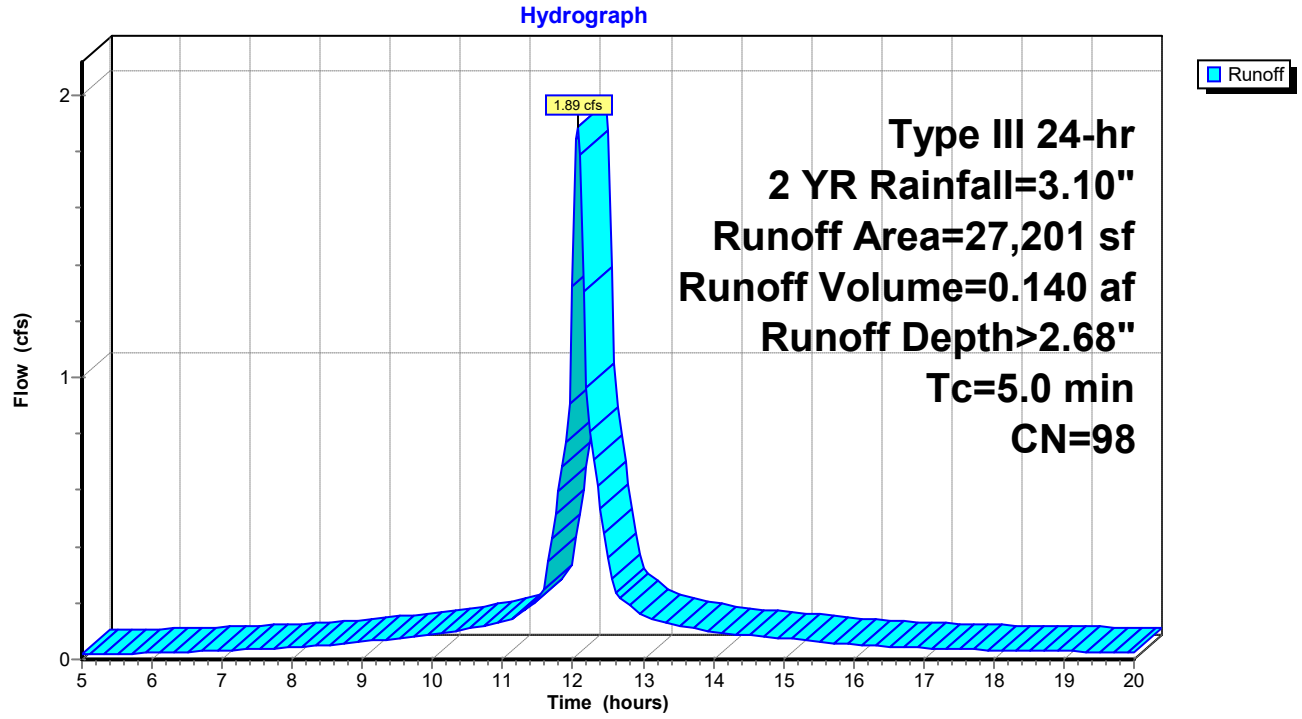
Runoff = 1.89 cfs @ 12.07 hrs, Volume= 0.140 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

Area (sf)	CN	Description
27,201	98	Paved parking, HSG A
27,201		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #35: #35 Bedford Roof



Summary for Subcatchment 1S: Watershed to Durham SD

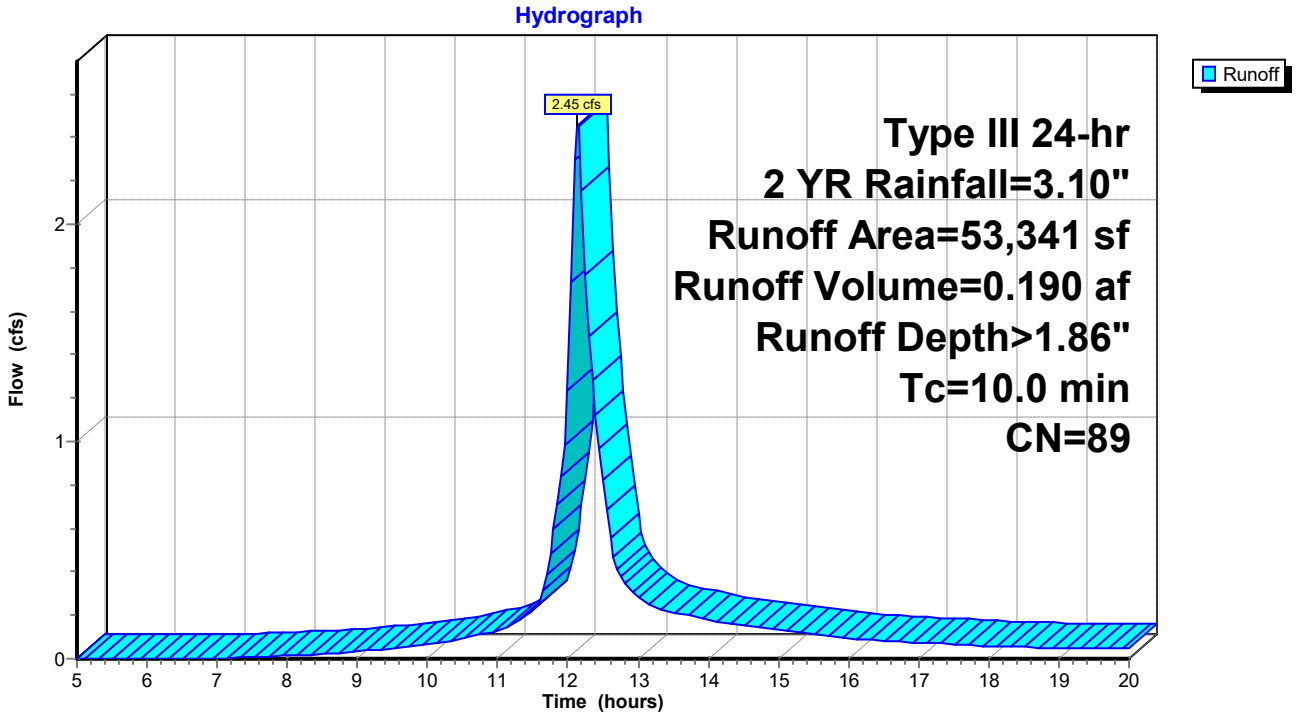
Runoff = 2.45 cfs @ 12.14 hrs, Volume= 0.190 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

Area (sf)	CN	Description
33,152	98	Paved parking, HSG A
20,189	74	>75% Grass cover, Good, HSG C
53,341	89	Weighted Average
20,189		37.85% Pervious Area
33,152		62.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Watershed to Durham SD



Summary for Subcatchment 2S: Woodbury Parking Lot

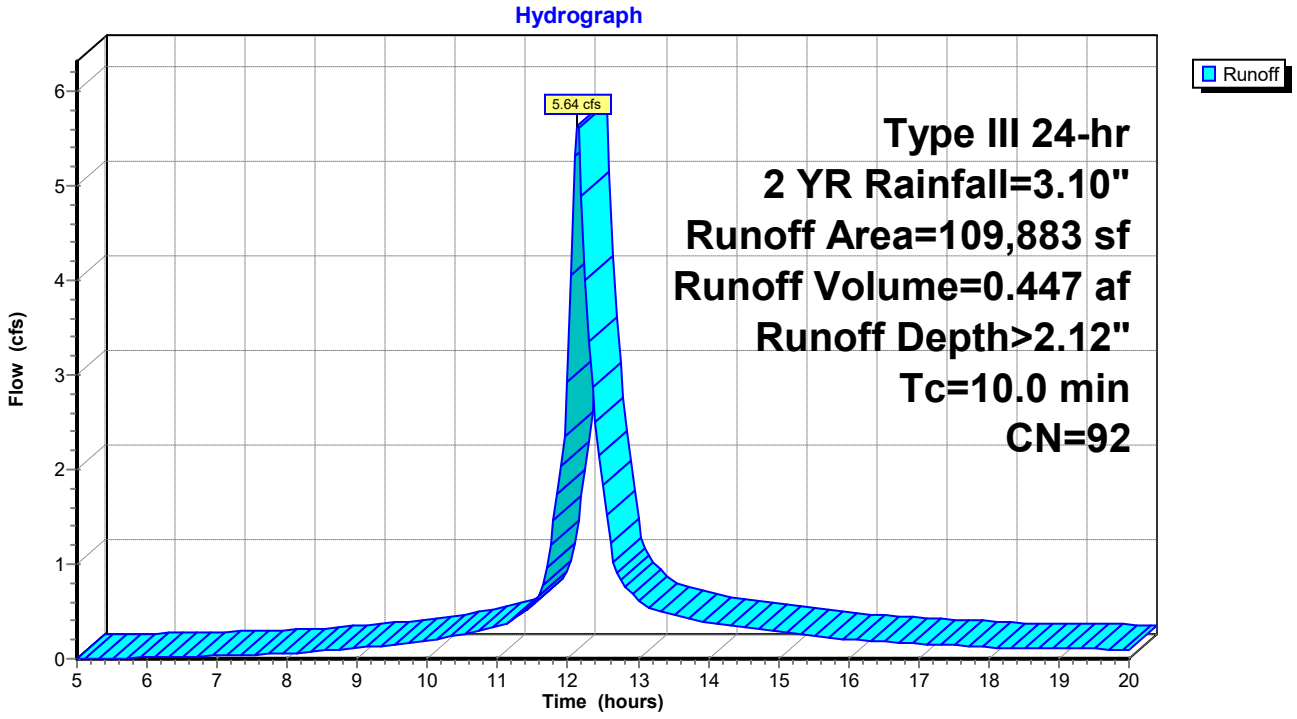
Runoff = 5.64 cfs @ 12.14 hrs, Volume= 0.447 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

Area (sf)	CN	Description
82,271	98	Paved parking, HSG A
27,612	74	>75% Grass cover, Good, HSG C
109,883	92	Weighted Average
27,612		25.13% Pervious Area
82,271		74.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: Woodbury Parking Lot

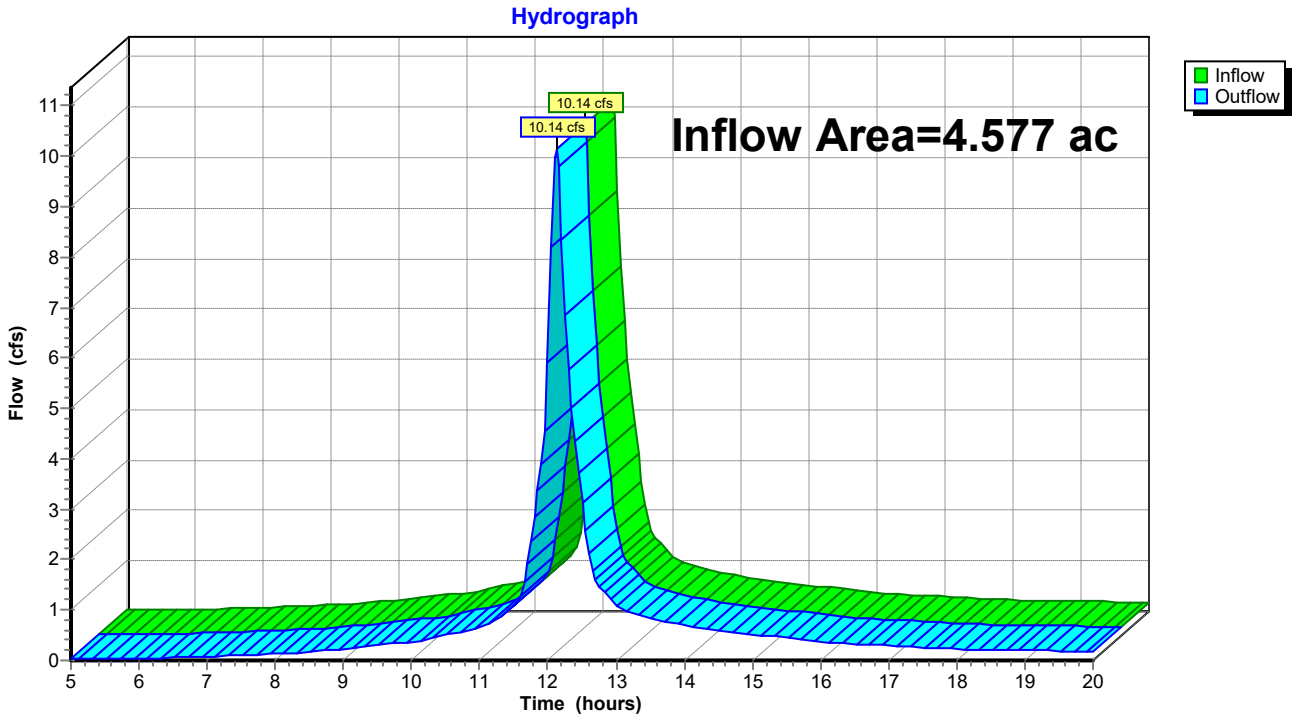


Summary for Reach 100R: POI 100

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 2.16" for 2 YR event
Inflow = 10.14 cfs @ 12.12 hrs, Volume= 0.822 af
Outflow = 10.14 cfs @ 12.12 hrs, Volume= 0.822 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 100R: POI 100



Summary for Pond 1P: Durham SD System

Inflow Area = 1.225 ac, 62.15% Impervious, Inflow Depth > 1.86" for 2 YR event
Inflow = 2.45 cfs @ 12.14 hrs, Volume= 0.190 af
Outflow = 2.46 cfs @ 12.14 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min
Primary = 2.46 cfs @ 12.14 hrs, Volume= 0.190 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.18' @ 12.14 hrs Surf.Area= 9 sf Storage= 6 cf

Plug-Flow detention time= 0.1 min calculated for 0.190 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (782.5 - 782.4)

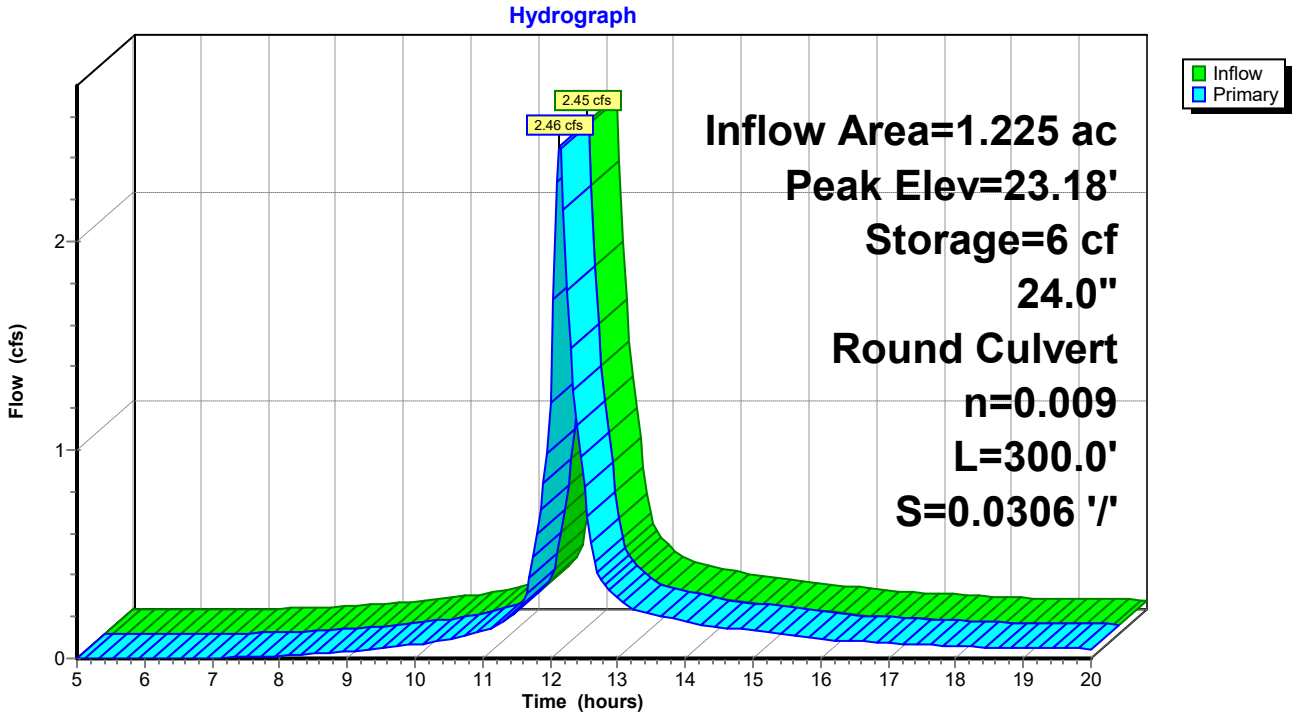
Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,591 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	100	1	51
29.00	15,000	6,040	6,091
30.00	1,000,000	507,500	513,591

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.42 cfs @ 12.14 hrs HW=23.18' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.42 cfs @ 2.74 fps)

Pond 1P: Durham SD System



Summary for Pond 2P: Bedford SD System

Inflow Area = 3.147 ac, 79.86% Impervious, Inflow Depth > 2.24" for 2 YR event
Inflow = 7.20 cfs @ 12.12 hrs, Volume= 0.586 af
Outflow = 7.20 cfs @ 12.12 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min
Primary = 7.20 cfs @ 12.12 hrs, Volume= 0.586 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 22.91' @ 12.12 hrs Surf.Area= 9 sf Storage= 7 cf

Plug-Flow detention time= 0.0 min calculated for 0.584 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (763.1 - 763.1)

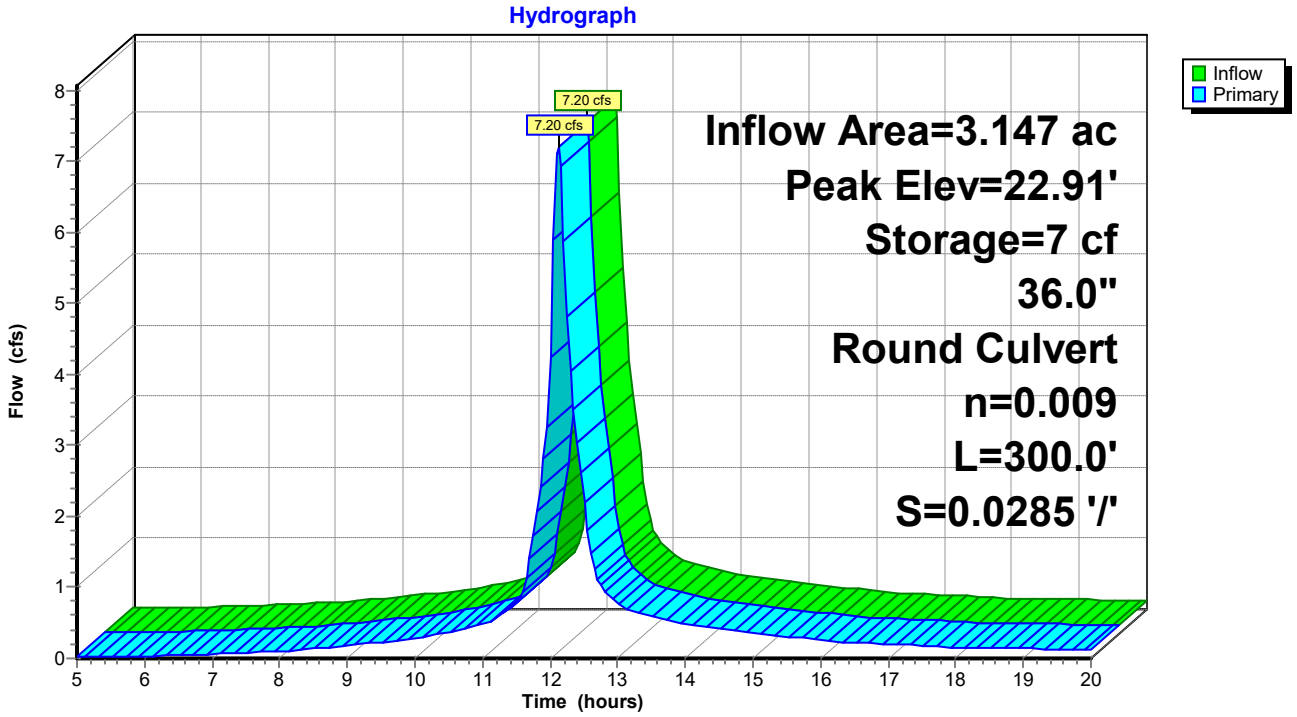
Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=7.03 cfs @ 12.12 hrs HW=22.90' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.03 cfs @ 3.41 fps)

Pond 2P: Bedford SD System



Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 2.16" for 2 YR event
Inflow = 10.14 cfs @ 12.12 hrs, Volume= 0.822 af
Outflow = 10.14 cfs @ 12.12 hrs, Volume= 0.822 af, Atten= 0%, Lag= 0.0 min
Primary = 10.14 cfs @ 12.12 hrs, Volume= 0.822 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 14.81' @ 12.12 hrs Surf.Area= 9 sf Storage= 13 cf

Plug-Flow detention time= 0.1 min calculated for 0.822 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (766.2 - 766.2)

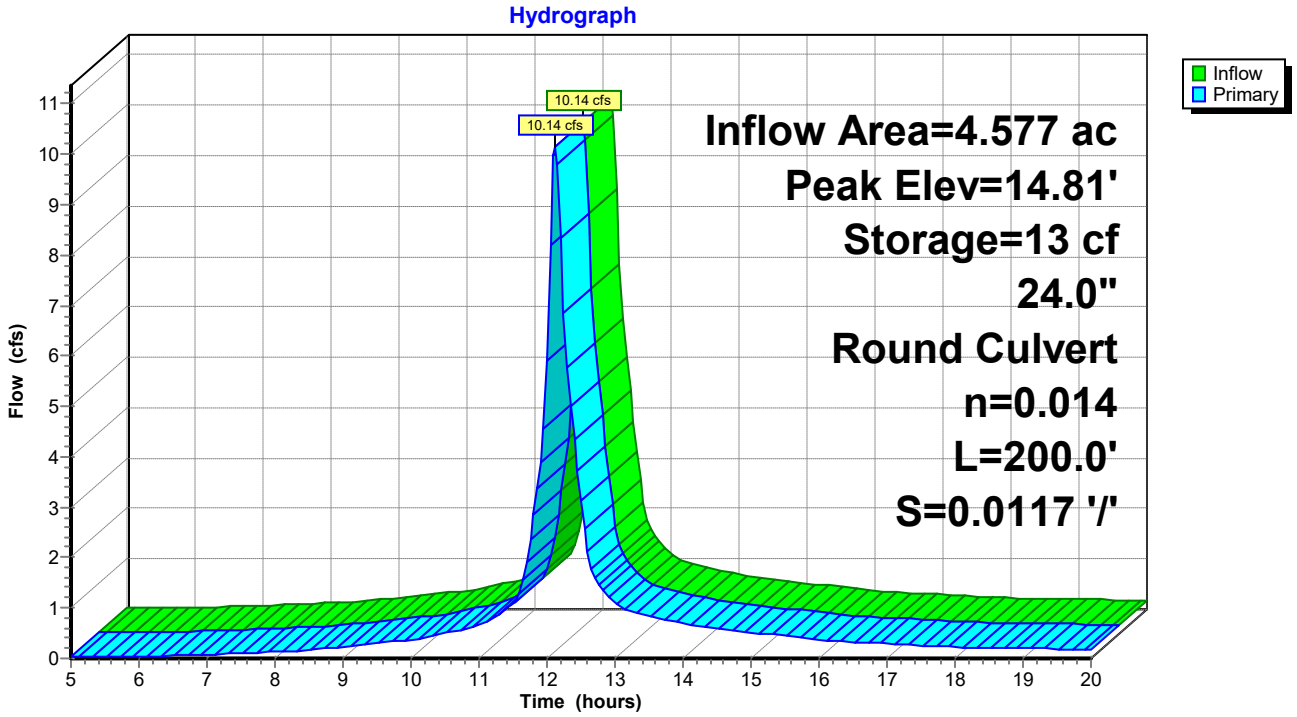
Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=9.91 cfs @ 12.12 hrs HW=14.79' (Free Discharge)
1=Culvert (Inlet Controls 9.91 cfs @ 4.09 fps)

Pond 3P: DMH corner Bedford Durham



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment #25: #25 Bedford Roof Runoff Area=8,950 sf 100.00% Impervious Runoff Depth>4.05"
Tc=5.0 min CN=98 Runoff=0.93 cfs 0.069 af

Subcatchment #35: #35 Bedford Roof Runoff Area=27,201 sf 100.00% Impervious Runoff Depth>4.05"
Tc=5.0 min CN=98 Runoff=2.83 cfs 0.211 af

Subcatchment 1S: Watershed to Durham Runoff Area=53,341 sf 62.15% Impervious Runoff Depth>3.19"
Tc=10.0 min CN=89 Runoff=4.11 cfs 0.326 af

Subcatchment 2S: Woodbury Parking Lot Runoff Area=109,883 sf 74.87% Impervious Runoff Depth>3.49"
Tc=10.0 min CN=92 Runoff=9.03 cfs 0.734 af

Reach 100R: POI 100 Inflow=16.21 cfs 1.341 af
Outflow=16.21 cfs 1.341 af

Pond 1P: Durham SD System Peak Elev=23.39' Storage=8 cf Inflow=4.11 cfs 0.326 af
24.0" Round Culvert n=0.009 L=300.0' S=0.0306 '/' Outflow=4.11 cfs 0.326 af

Pond 2P: Bedford SD System Peak Elev=23.20' Storage=9 cf Inflow=11.37 cfs 0.945 af
36.0" Round Culvert n=0.009 L=300.0' S=0.0285 '/' Outflow=11.37 cfs 0.945 af

Pond 3P: DMH corner Bedford Durham Peak Elev=15.50' Storage=19 cf Inflow=16.22 cfs 1.341 af
24.0" Round Culvert n=0.014 L=200.0' S=0.0117 '/' Outflow=16.21 cfs 1.341 af

Total Runoff Area = 4.577 ac Runoff Volume = 1.341 af Average Runoff Depth = 3.52"
23.98% Pervious = 1.097 ac 76.02% Impervious = 3.480 ac

Summary for Subcatchment #25: #25 Bedford Roof

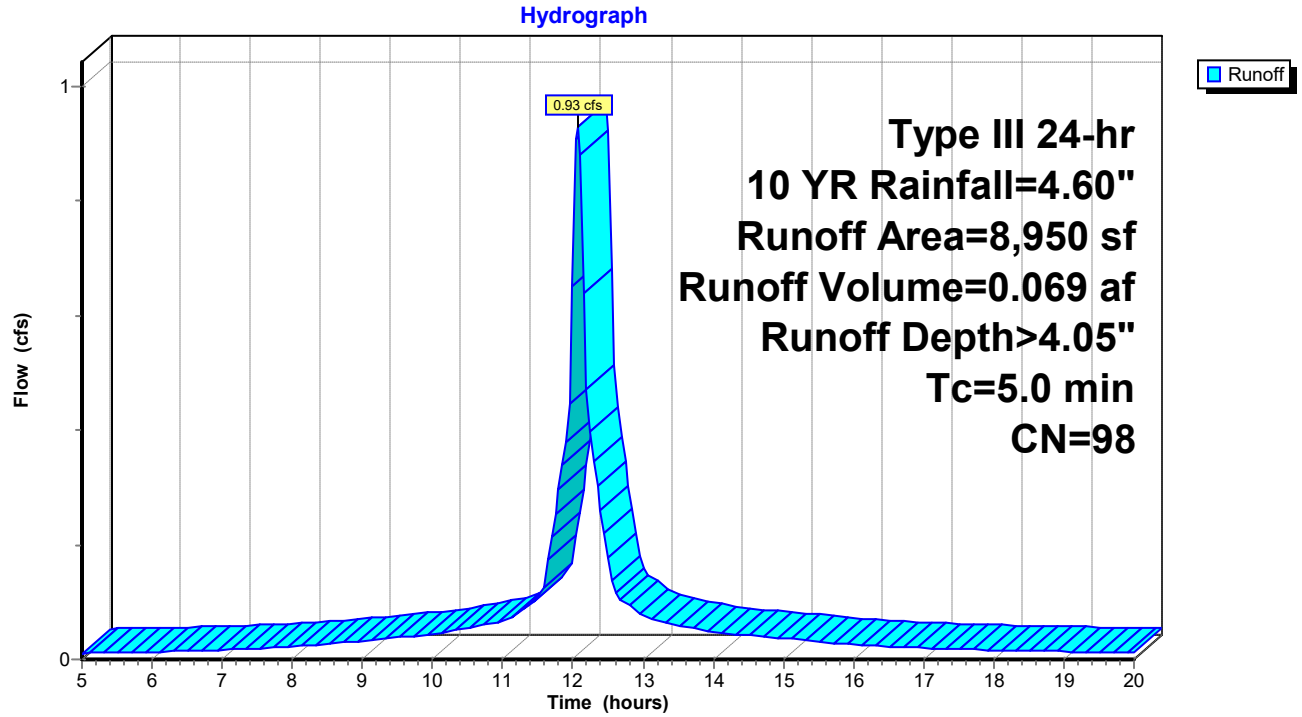
Runoff = 0.93 cfs @ 12.07 hrs, Volume= 0.069 af, Depth> 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

Area (sf)	CN	Description
8,950	98	Paved parking, HSG A
8,950		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #25: #25 Bedford Roof



Summary for Subcatchment #35: #35 Bedford Roof

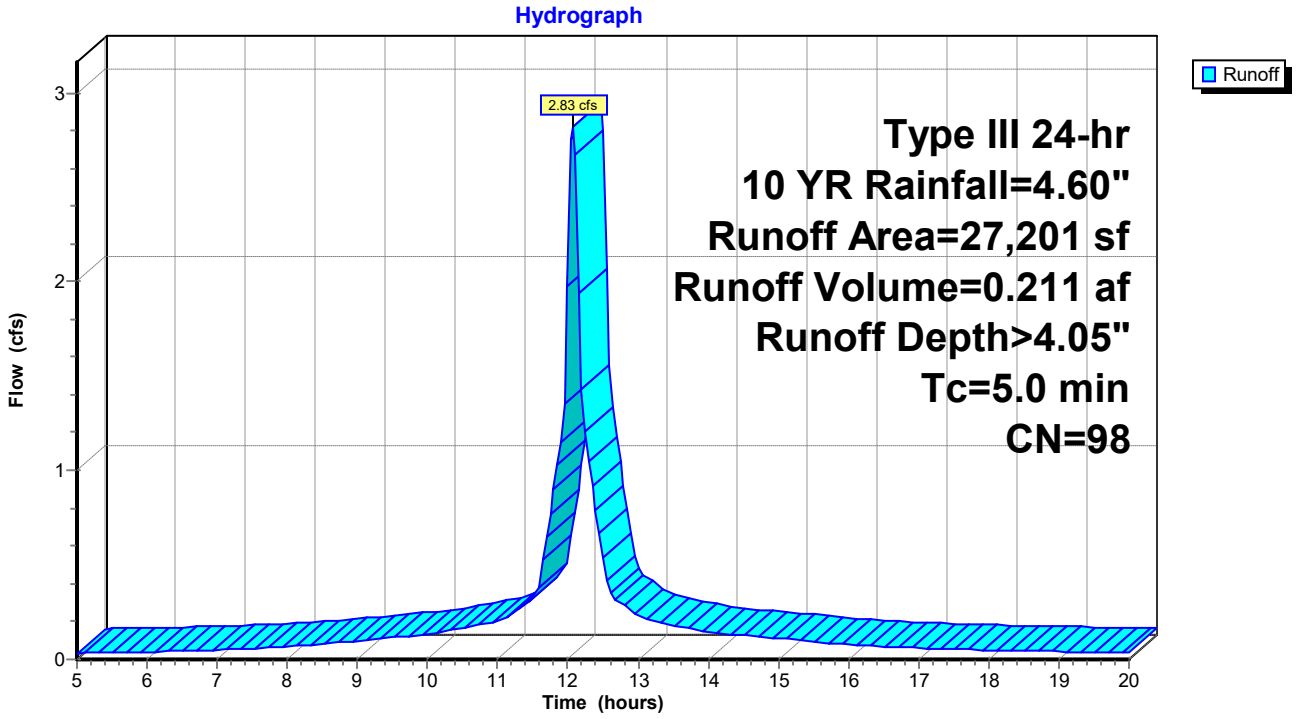
Runoff = 2.83 cfs @ 12.07 hrs, Volume= 0.211 af, Depth> 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

Area (sf)	CN	Description
27,201	98	Paved parking, HSG A
27,201		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #35: #35 Bedford Roof



Summary for Subcatchment 1S: Watershed to Durham SD

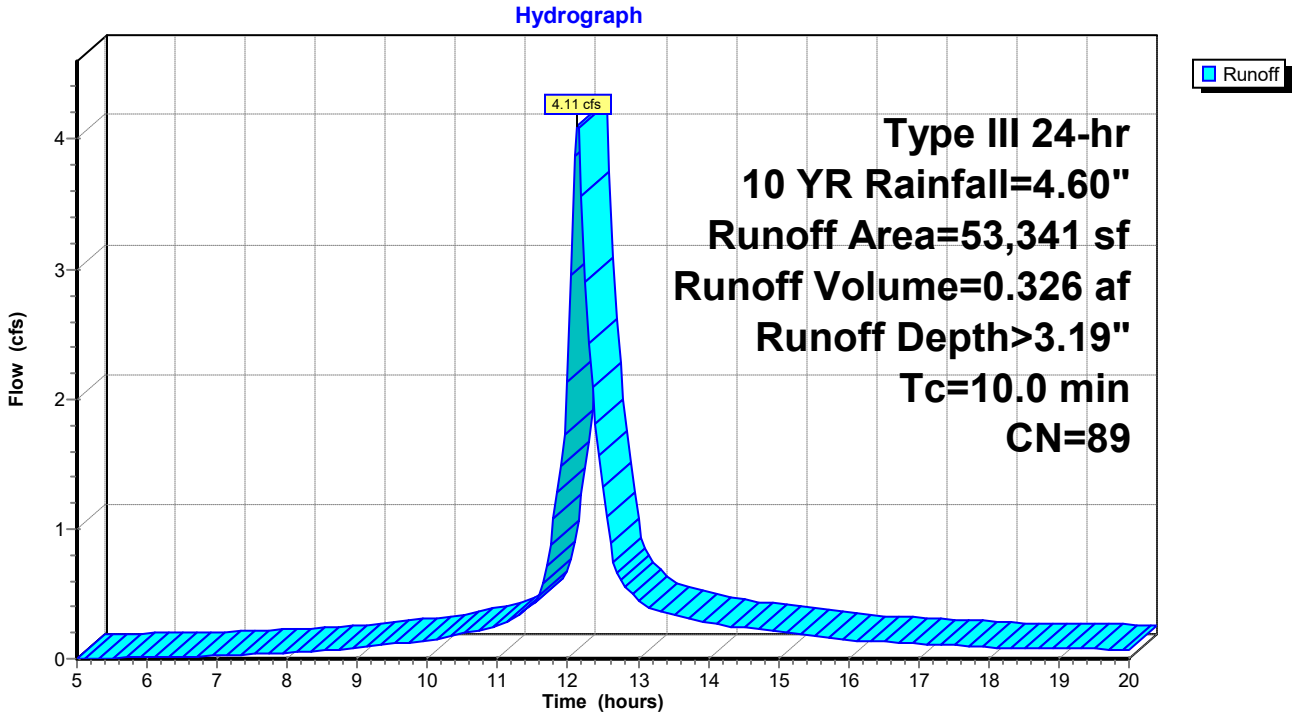
Runoff = 4.11 cfs @ 12.14 hrs, Volume= 0.326 af, Depth> 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

Area (sf)	CN	Description
33,152	98	Paved parking, HSG A
20,189	74	>75% Grass cover, Good, HSG C
53,341	89	Weighted Average
20,189		37.85% Pervious Area
33,152		62.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Watershed to Durham SD



Summary for Subcatchment 2S: Woodbury Parking Lot

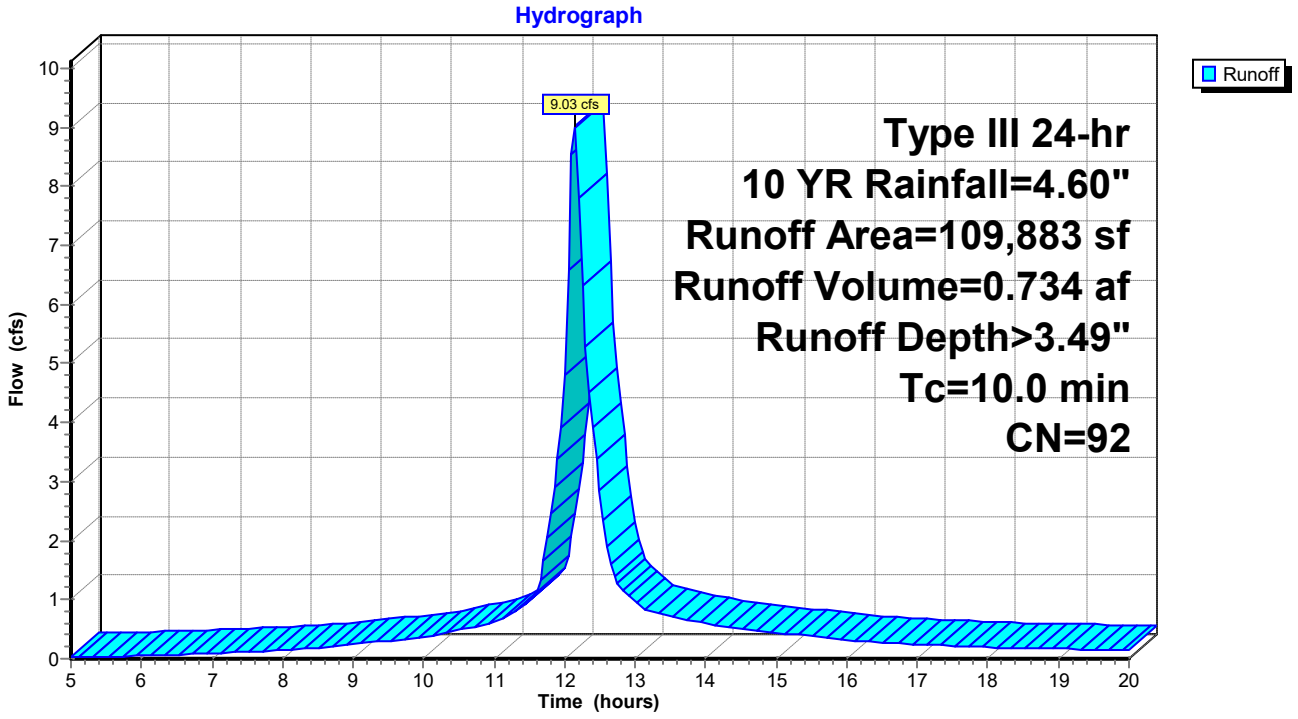
Runoff = 9.03 cfs @ 12.14 hrs, Volume= 0.734 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

Area (sf)	CN	Description
82,271	98	Paved parking, HSG A
27,612	74	>75% Grass cover, Good, HSG C
109,883	92	Weighted Average
27,612		25.13% Pervious Area
82,271		74.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: Woodbury Parking Lot

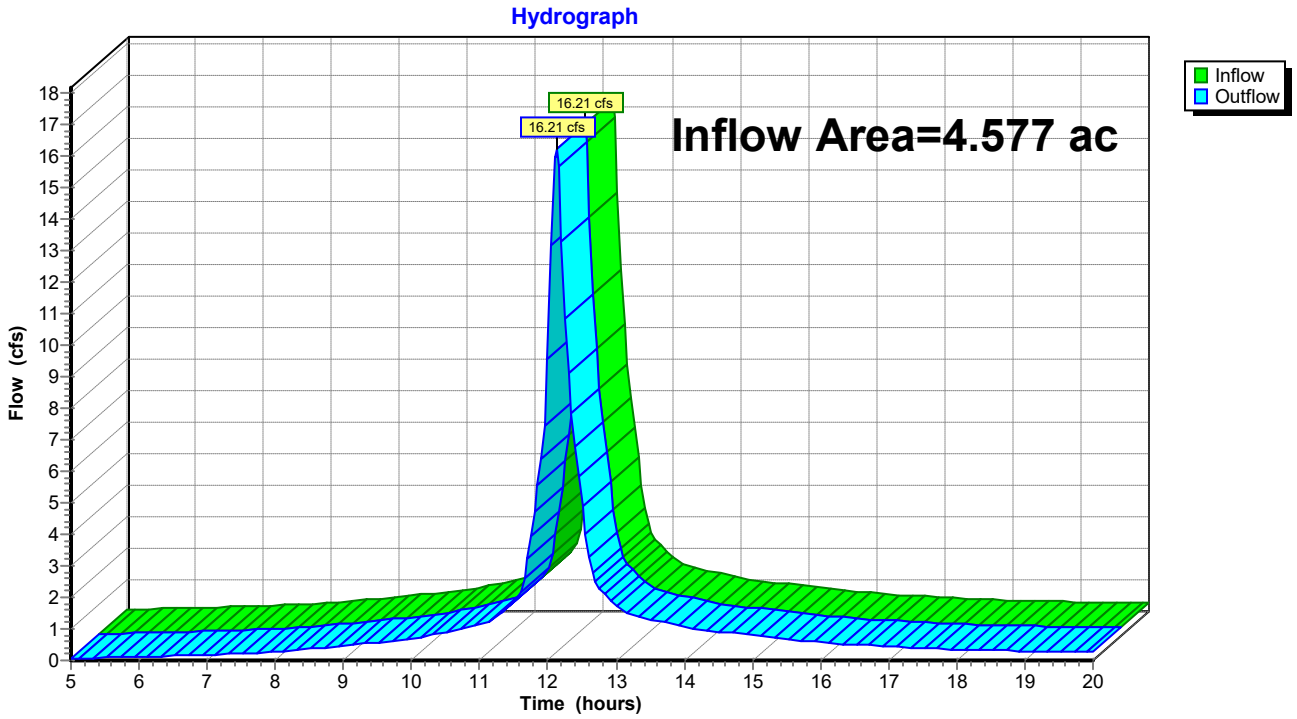


Summary for Reach 100R: POI 100

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 3.52" for 10 YR event
Inflow = 16.21 cfs @ 12.12 hrs, Volume= 1.341 af
Outflow = 16.21 cfs @ 12.12 hrs, Volume= 1.341 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 100R: POI 100



Summary for Pond 1P: Durham SD System

Inflow Area = 1.225 ac, 62.15% Impervious, Inflow Depth > 3.19" for 10 YR event
Inflow = 4.11 cfs @ 12.14 hrs, Volume= 0.326 af
Outflow = 4.11 cfs @ 12.14 hrs, Volume= 0.326 af, Atten= 0%, Lag= 0.0 min
Primary = 4.11 cfs @ 12.14 hrs, Volume= 0.326 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.39' @ 12.14 hrs Surf.Area= 9 sf Storage= 8 cf

Plug-Flow detention time= 0.1 min calculated for 0.326 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (769.6 - 769.6)

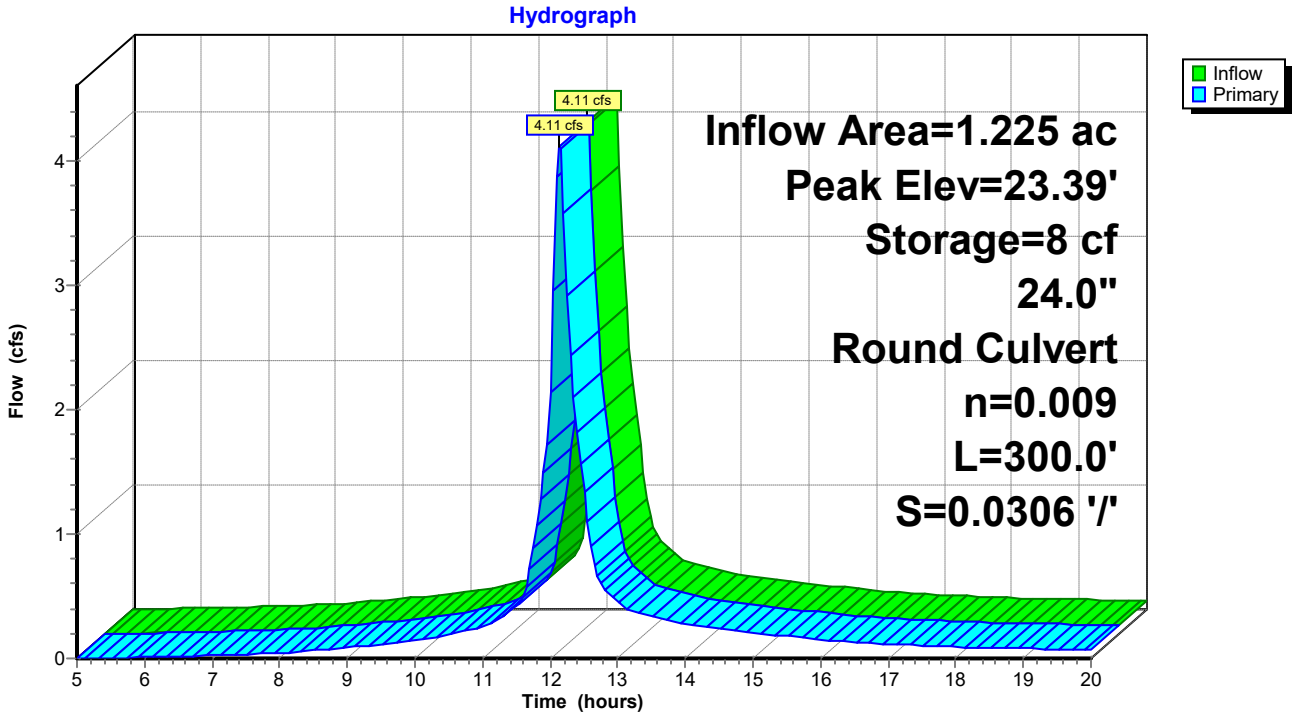
Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,591 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	100	1	51
29.00	15,000	6,040	6,091
30.00	1,000,000	507,500	513,591

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.04 cfs @ 12.14 hrs HW=23.39' (Free Discharge)
1=Culvert (Inlet Controls 4.04 cfs @ 3.15 fps)

Pond 1P: Durham SD System



Summary for Pond 2P: Bedford SD System

Inflow Area = 3.147 ac, 79.86% Impervious, Inflow Depth > 3.60" for 10 YR event
Inflow = 11.37 cfs @ 12.12 hrs, Volume= 0.945 af
Outflow = 11.37 cfs @ 12.12 hrs, Volume= 0.945 af, Atten= 0%, Lag= 0.0 min
Primary = 11.37 cfs @ 12.12 hrs, Volume= 0.945 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.20' @ 12.12 hrs Surf.Area= 9 sf Storage= 9 cf

Plug-Flow detention time= 0.0 min calculated for 0.942 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (754.2 - 754.2)

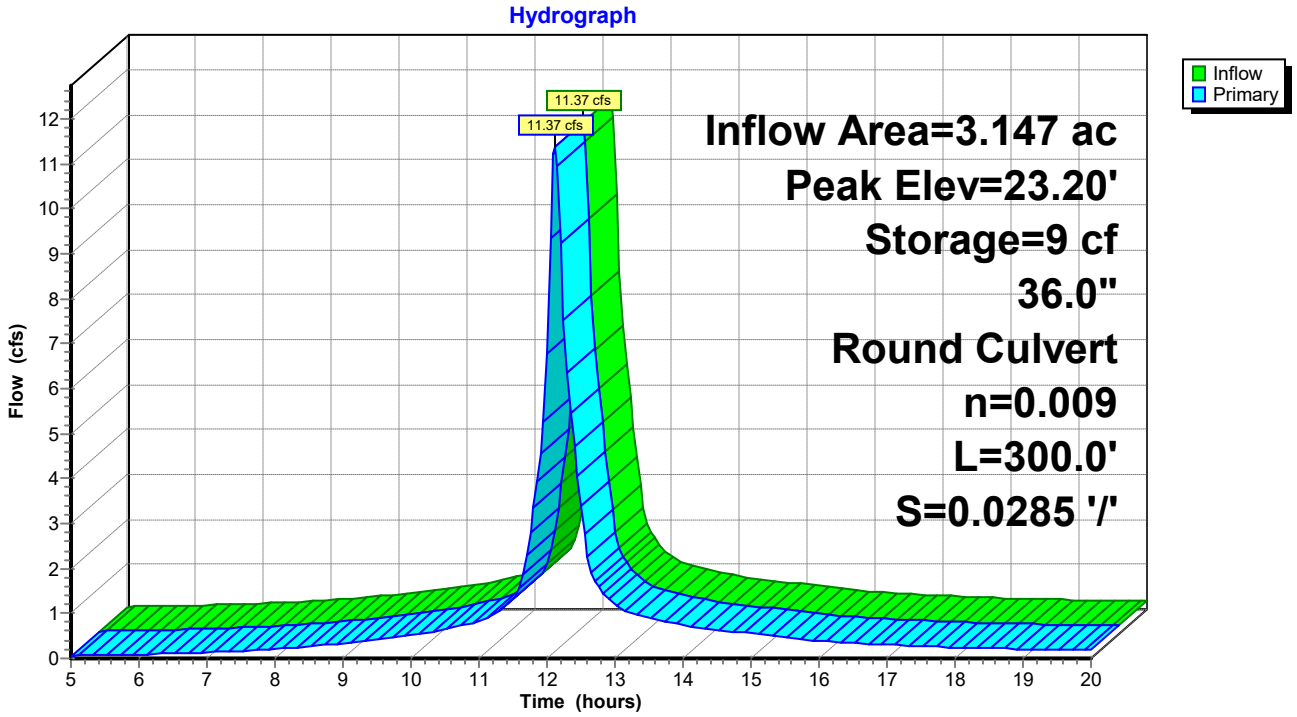
Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=11.11 cfs @ 12.12 hrs HW=23.18' (Free Discharge)
1=Culvert (Inlet Controls 11.11 cfs @ 3.86 fps)

Pond 2P: Bedford SD System



Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 3.52" for 10 YR event
Inflow = 16.22 cfs @ 12.12 hrs, Volume= 1.341 af
Outflow = 16.21 cfs @ 12.12 hrs, Volume= 1.341 af, Atten= 0%, Lag= 0.0 min
Primary = 16.21 cfs @ 12.12 hrs, Volume= 1.341 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 15.50' @ 12.12 hrs Surf.Area= 9 sf Storage= 19 cf

Plug-Flow detention time= 0.1 min calculated for 1.336 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (757.0 - 757.0)

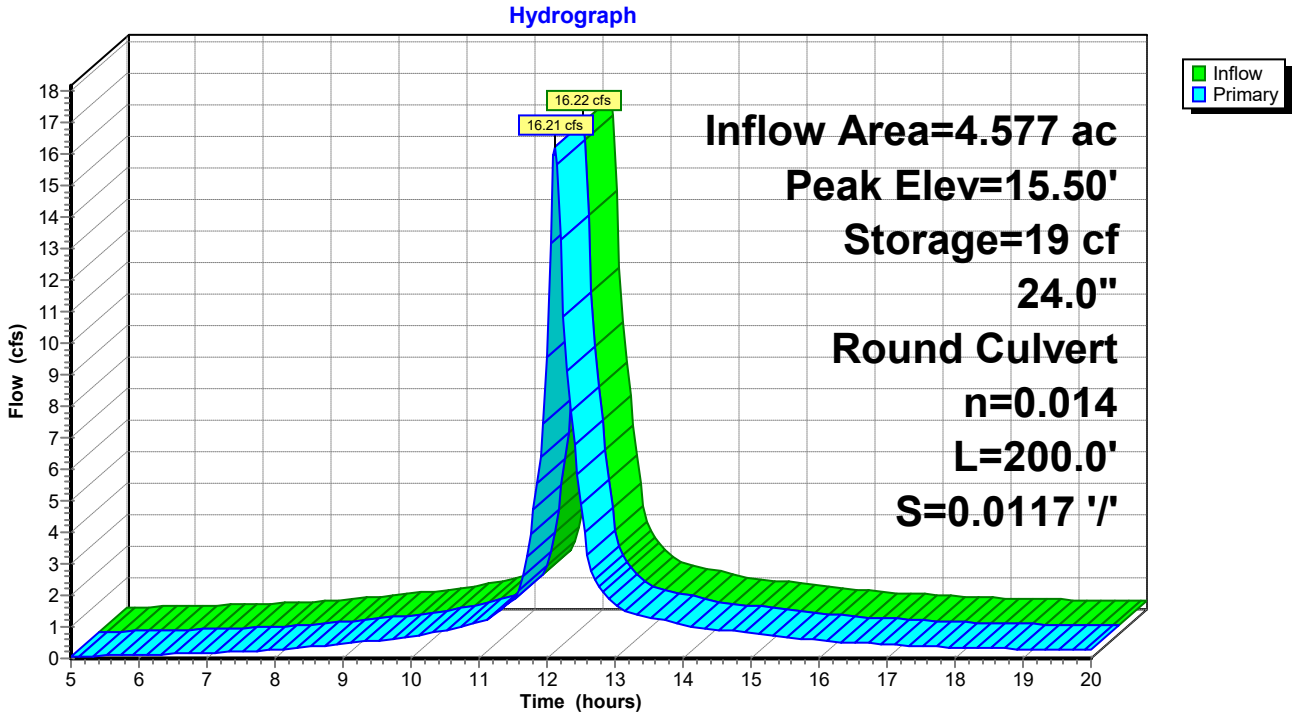
Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=15.85 cfs @ 12.12 hrs HW=15.45' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 15.85 cfs @ 5.04 fps)

Pond 3P: DMH corner Bedford Durham



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment #25: #25 Bedford Roof Runoff Area=8,950 sf 100.00% Impervious Runoff Depth>5.15"
Tc=5.0 min CN=98 Runoff=1.18 cfs 0.088 af

Subcatchment #35: #35 Bedford Roof Runoff Area=27,201 sf 100.00% Impervious Runoff Depth>5.15"
Tc=5.0 min CN=98 Runoff=3.57 cfs 0.268 af

Subcatchment 1S: Watershed to Durham Runoff Area=53,341 sf 62.15% Impervious Runoff Depth>4.29"
Tc=10.0 min CN=89 Runoff=5.42 cfs 0.438 af

Subcatchment 2S: Woodbury Parking Lot Runoff Area=109,883 sf 74.87% Impervious Runoff Depth>4.60"
Tc=10.0 min CN=92 Runoff=11.71 cfs 0.967 af

Reach 100R: POI 100 Inflow=21.05 cfs 1.760 af
Outflow=21.05 cfs 1.760 af

Pond 1P: Durham SD System Peak Elev=23.54' Storage=9 cf Inflow=5.42 cfs 0.438 af
24.0" Round Culvert n=0.009 L=300.0' S=0.0306 '/' Outflow=5.42 cfs 0.438 af

Pond 2P: Bedford SD System Peak Elev=23.40' Storage=11 cf Inflow=14.68 cfs 1.235 af
36.0" Round Culvert n=0.009 L=300.0' S=0.0285 '/' Outflow=14.68 cfs 1.235 af

Pond 3P: DMH corner Bedford Durham Peak Elev=16.28' Storage=26 cf Inflow=21.05 cfs 1.760 af
24.0" Round Culvert n=0.014 L=200.0' S=0.0117 '/' Outflow=21.05 cfs 1.760 af

Total Runoff Area = 4.577 ac Runoff Volume = 1.760 af Average Runoff Depth = 4.62"
23.98% Pervious = 1.097 ac 76.02% Impervious = 3.480 ac

Summary for Subcatchment #25: #25 Bedford Roof

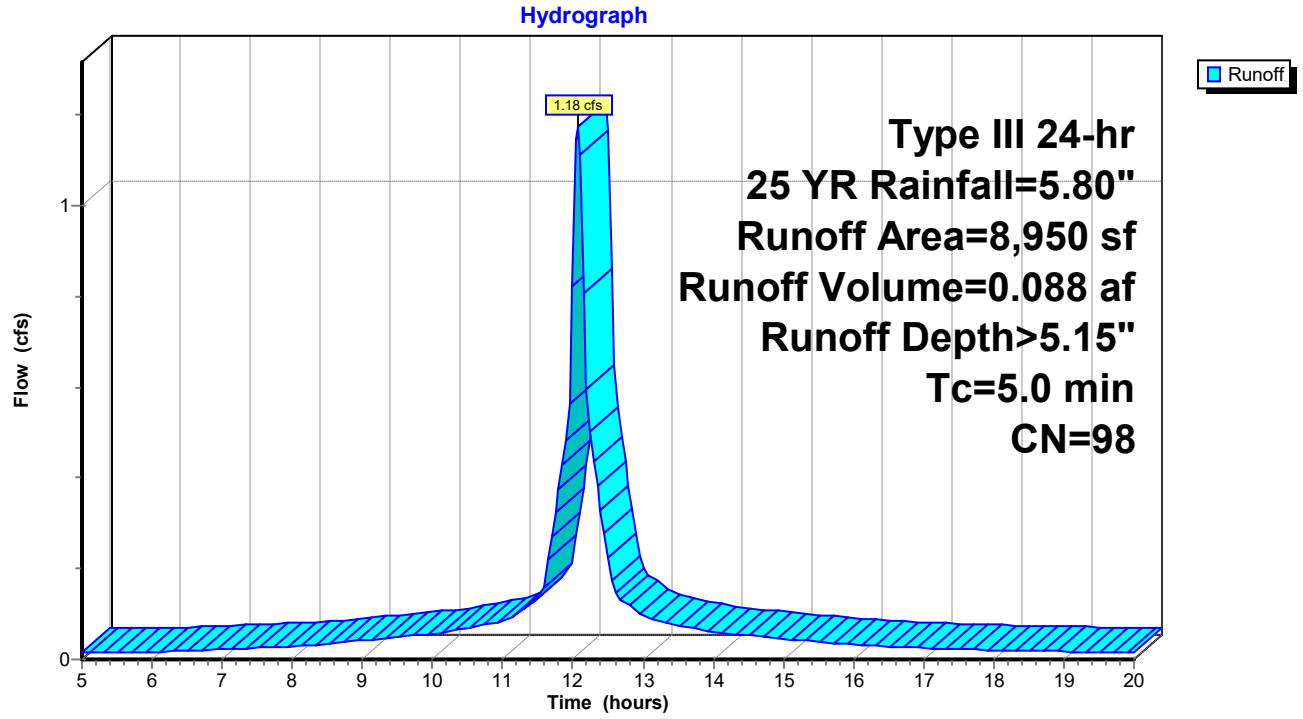
Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.088 af, Depth> 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

Area (sf)	CN	Description
8,950	98	Paved parking, HSG A
8,950		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #25: #25 Bedford Roof



Summary for Subcatchment #35: #35 Bedford Roof

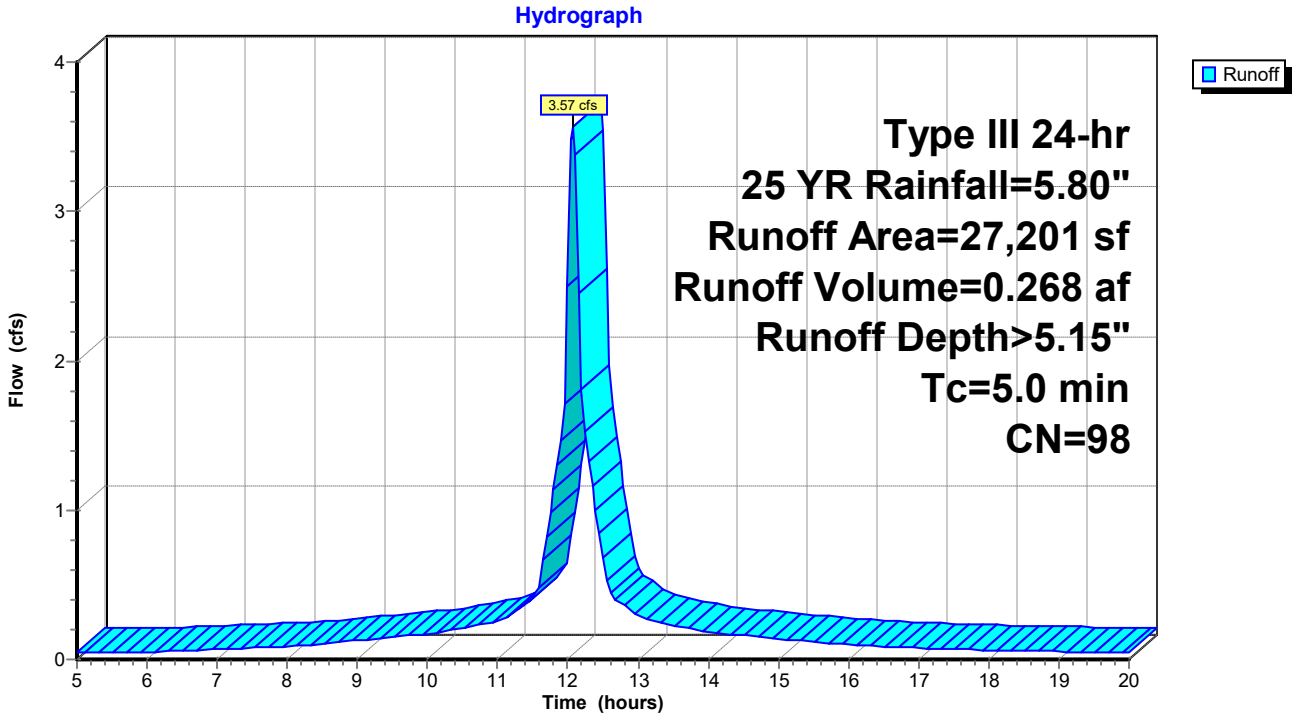
Runoff = 3.57 cfs @ 12.07 hrs, Volume= 0.268 af, Depth> 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

Area (sf)	CN	Description
27,201	98	Paved parking, HSG A
27,201		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #35: #35 Bedford Roof



Summary for Subcatchment 1S: Watershed to Durham SD

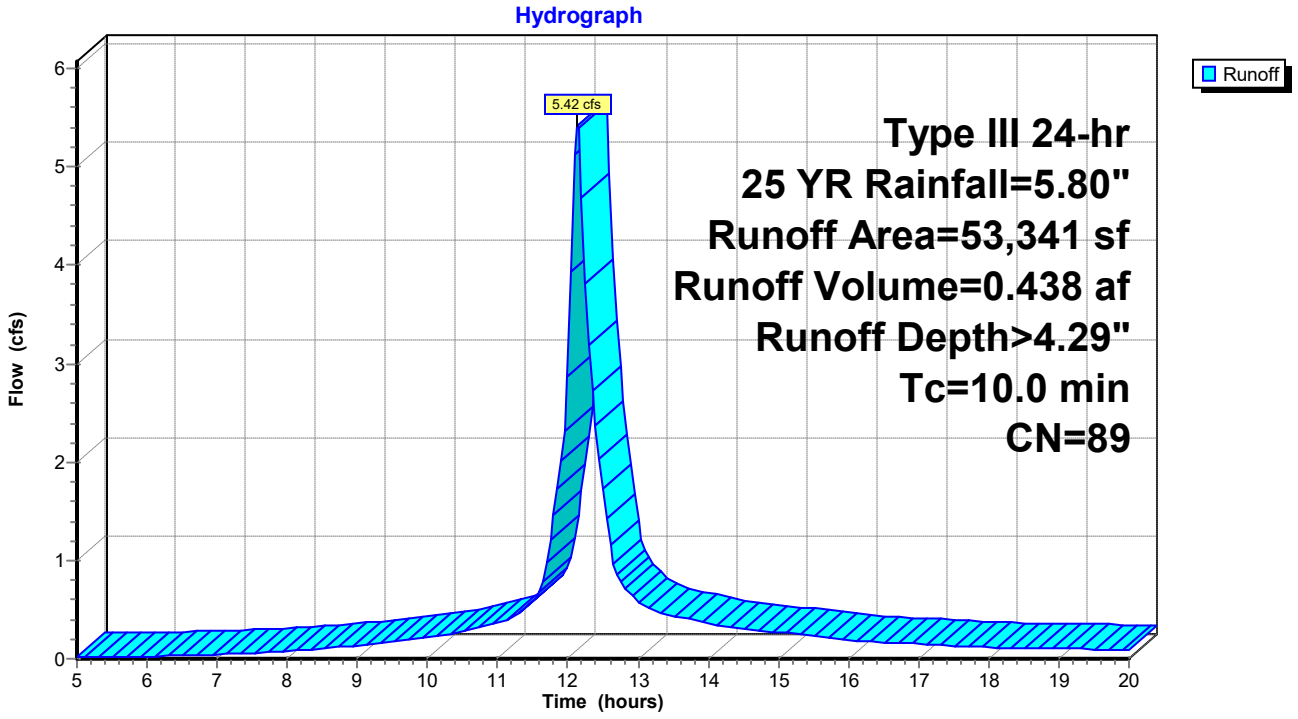
Runoff = 5.42 cfs @ 12.14 hrs, Volume= 0.438 af, Depth> 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

Area (sf)	CN	Description
33,152	98	Paved parking, HSG A
20,189	74	>75% Grass cover, Good, HSG C
53,341	89	Weighted Average
20,189		37.85% Pervious Area
33,152		62.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Watershed to Durham SD



Summary for Subcatchment 2S: Woodbury Parking Lot

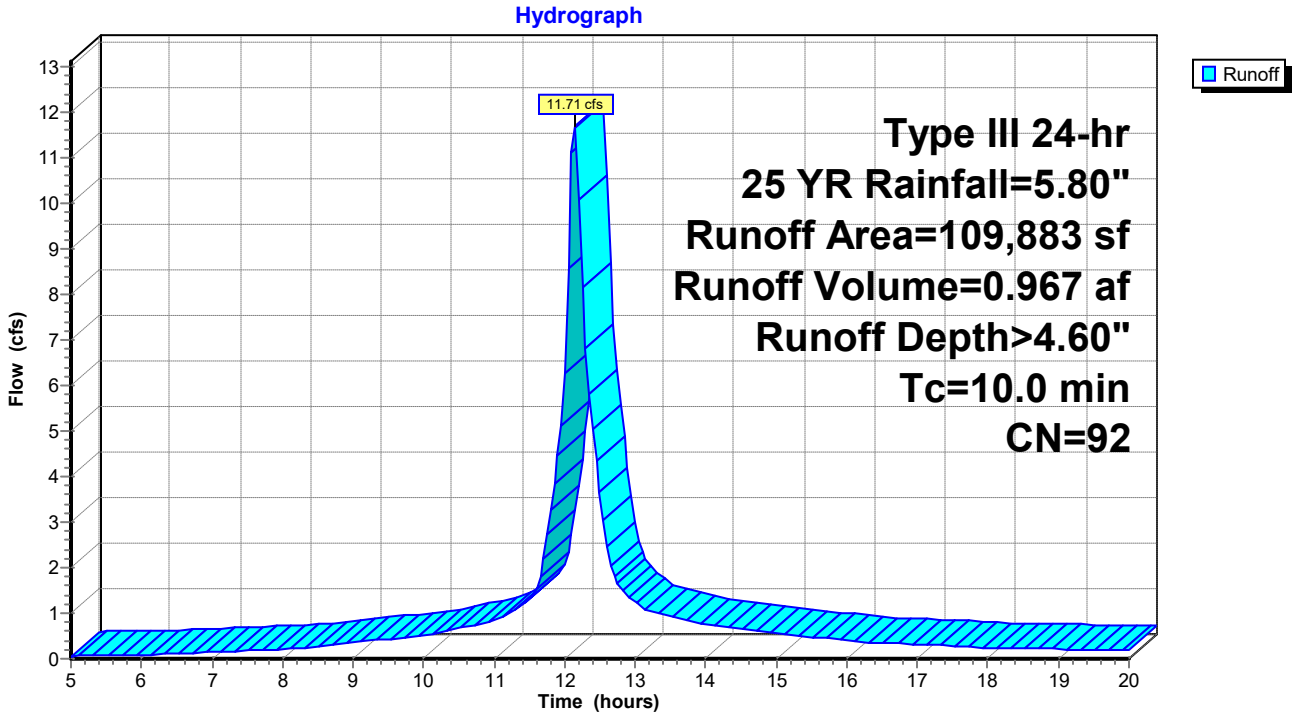
Runoff = 11.71 cfs @ 12.14 hrs, Volume= 0.967 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

Area (sf)	CN	Description
82,271	98	Paved parking, HSG A
27,612	74	>75% Grass cover, Good, HSG C
109,883	92	Weighted Average
27,612		25.13% Pervious Area
82,271		74.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: Woodbury Parking Lot

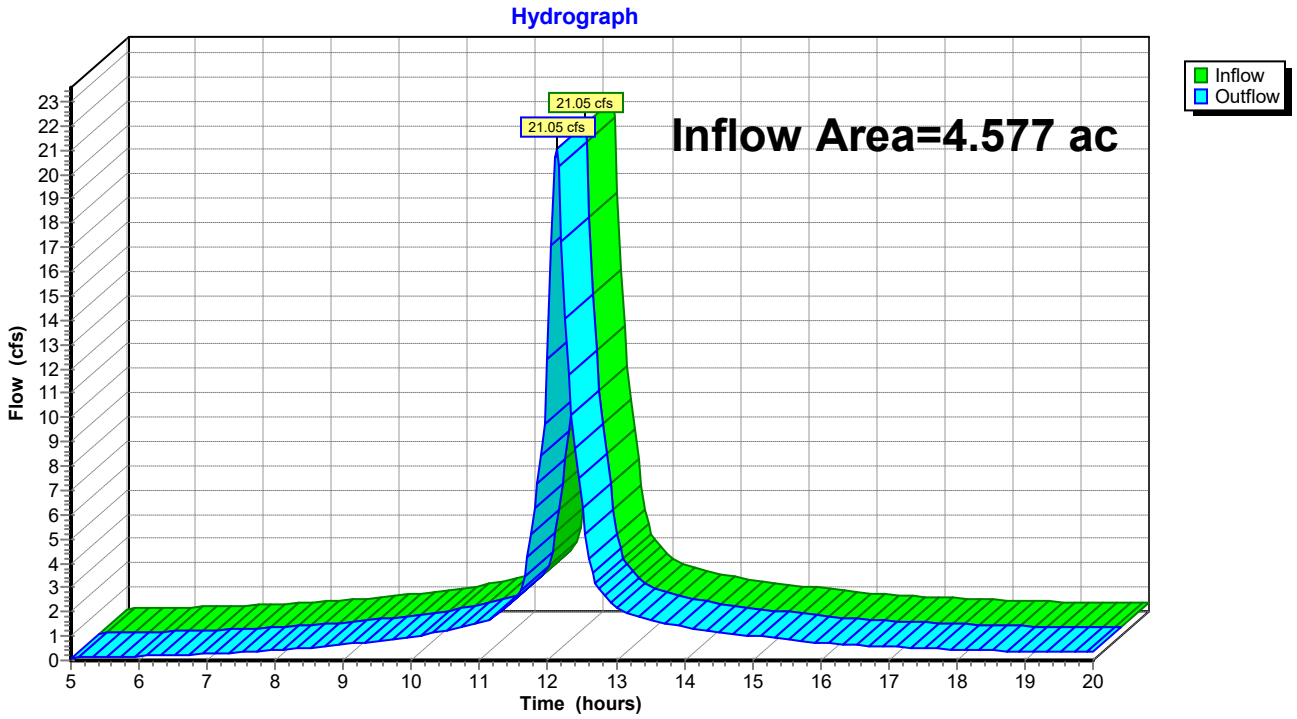


Summary for Reach 100R: POI 100

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 4.62" for 25 YR event
Inflow = 21.05 cfs @ 12.12 hrs, Volume= 1.760 af
Outflow = 21.05 cfs @ 12.12 hrs, Volume= 1.760 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 100R: POI 100



Summary for Pond 1P: Durham SD System

Inflow Area = 1.225 ac, 62.15% Impervious, Inflow Depth > 4.29" for 25 YR event
Inflow = 5.42 cfs @ 12.14 hrs, Volume= 0.438 af
Outflow = 5.42 cfs @ 12.14 hrs, Volume= 0.438 af, Atten= 0%, Lag= 0.0 min
Primary = 5.42 cfs @ 12.14 hrs, Volume= 0.438 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.54' @ 12.14 hrs Surf.Area= 9 sf Storage= 9 cf

Plug-Flow detention time= 0.1 min calculated for 0.438 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (762.9 - 762.9)

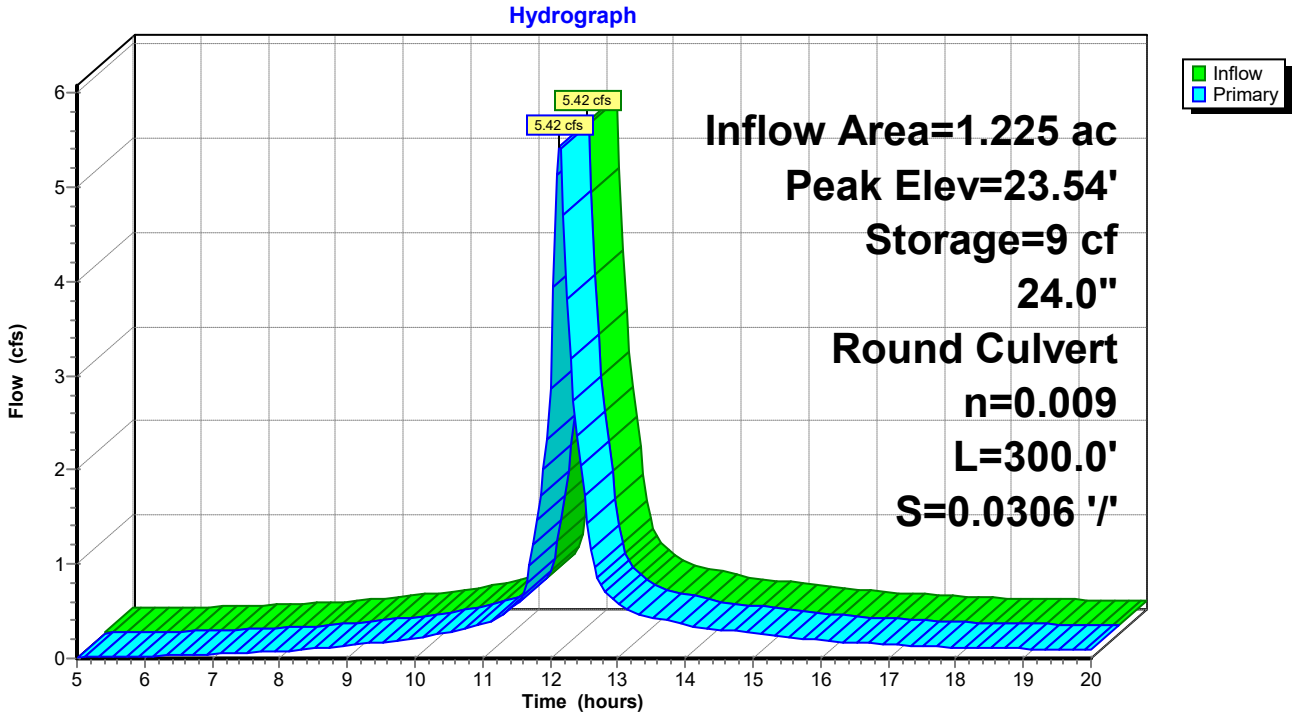
Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,591 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	100	1	51
29.00	15,000	6,040	6,091
30.00	1,000,000	507,500	513,591

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.34 cfs @ 12.14 hrs HW=23.53' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 5.34 cfs @ 3.40 fps)

Pond 1P: Durham SD System



Summary for Pond 2P: Bedford SD System

Inflow Area = 3.147 ac, 79.86% Impervious, Inflow Depth > 4.71" for 25 YR event
Inflow = 14.68 cfs @ 12.12 hrs, Volume= 1.235 af
Outflow = 14.68 cfs @ 12.12 hrs, Volume= 1.235 af, Atten= 0%, Lag= 0.0 min
Primary = 14.68 cfs @ 12.12 hrs, Volume= 1.235 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.40' @ 12.12 hrs Surf.Area= 9 sf Storage= 11 cf

Plug-Flow detention time= 0.0 min calculated for 1.235 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (750.0 - 750.0)

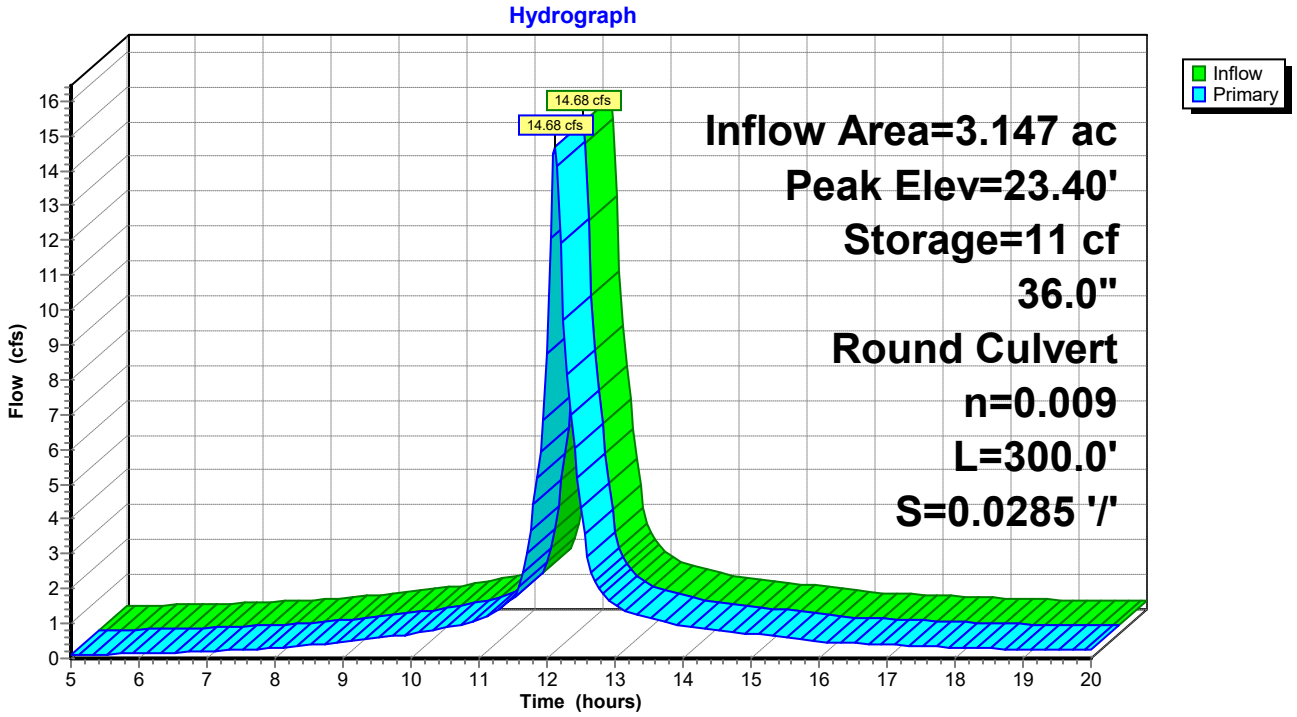
Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=14.35 cfs @ 12.12 hrs HW=23.38' (Free Discharge)
1=Culvert (Inlet Controls 14.35 cfs @ 4.14 fps)

Pond 2P: Bedford SD System



Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 4.62" for 25 YR event
Inflow = 21.05 cfs @ 12.12 hrs, Volume= 1.760 af
Outflow = 21.05 cfs @ 12.12 hrs, Volume= 1.760 af, Atten= 0%, Lag= 0.0 min
Primary = 21.05 cfs @ 12.12 hrs, Volume= 1.760 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 16.28' @ 12.12 hrs Surf.Area= 9 sf Storage= 26 cf

Plug-Flow detention time= 0.1 min calculated for 1.754 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (752.4 - 752.4)

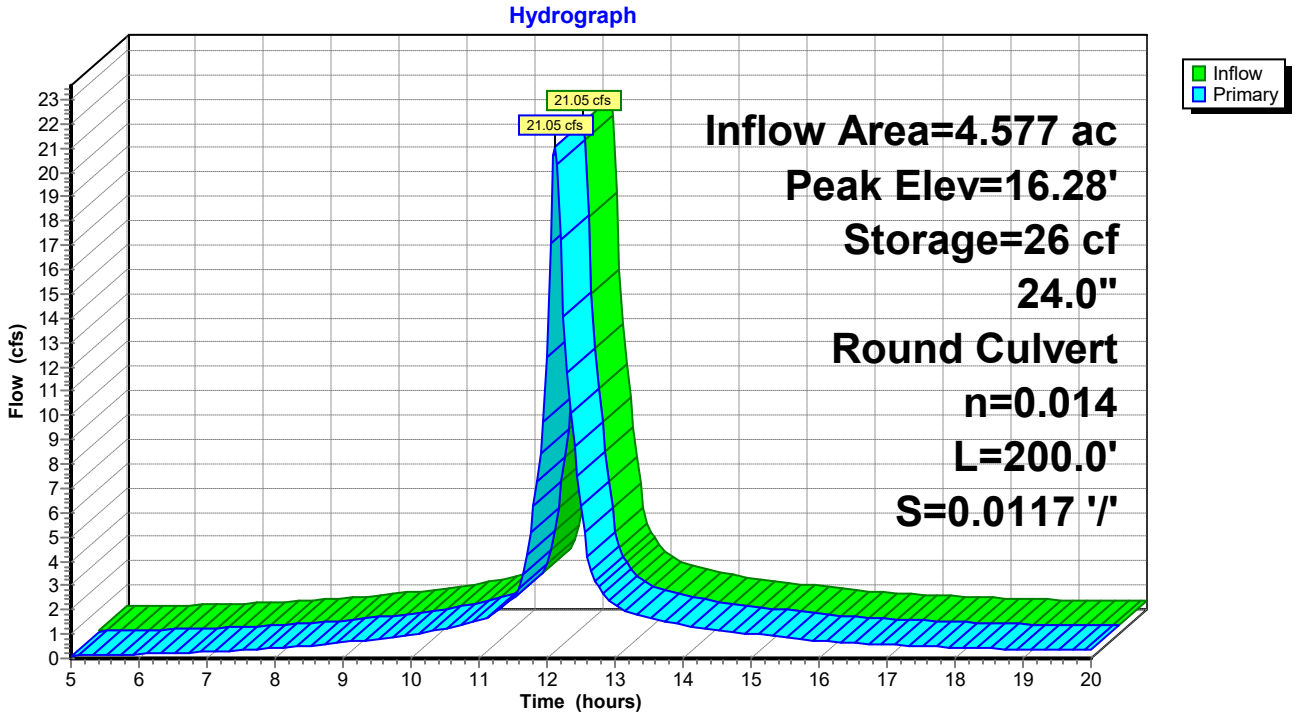
Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=20.57 cfs @ 12.12 hrs HW=16.20' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 20.57 cfs @ 6.55 fps)

Pond 3P: DMH corner Bedford Durham



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment #25: #25 Bedford Roof Runoff Area=8,950 sf 100.00% Impervious Runoff Depth>7.24"
Tc=5.0 min CN=98 Runoff=1.64 cfs 0.124 af

Subcatchment #35: #35 Bedford Roof Runoff Area=27,201 sf 100.00% Impervious Runoff Depth>7.24"
Tc=5.0 min CN=98 Runoff=5.00 cfs 0.377 af

Subcatchment 1S: Watershed to Durham Runoff Area=53,341 sf 62.15% Impervious Runoff Depth>6.40"
Tc=10.0 min CN=89 Runoff=7.93 cfs 0.654 af

Subcatchment 2S: Woodbury Parking Lot Runoff Area=109,883 sf 74.87% Impervious Runoff Depth>6.72"
Tc=10.0 min CN=92 Runoff=16.80 cfs 1.413 af

Reach 100R: POI 100 Inflow=30.19 cfs 2.567 af
Outflow=30.19 cfs 2.567 af

Pond 1P: Durham SD System Peak Elev=23.79' Storage=11 cf Inflow=7.93 cfs 0.654 af
24.0" Round Culvert n=0.009 L=300.0' S=0.0306 '/' Outflow=7.93 cfs 0.653 af

Pond 2P: Bedford SD System Peak Elev=23.74' Storage=14 cf Inflow=20.97 cfs 1.790 af
36.0" Round Culvert n=0.009 L=300.0' S=0.0285 '/' Outflow=20.97 cfs 1.790 af

Pond 3P: DMH corner Bedford Durham Peak Elev=19.27' Storage=53 cf Inflow=30.23 cfs 2.567 af
24.0" Round Culvert n=0.014 L=200.0' S=0.0117 '/' Outflow=30.19 cfs 2.567 af

Total Runoff Area = 4.577 ac Runoff Volume = 2.567 af Average Runoff Depth = 6.73"
23.98% Pervious = 1.097 ac 76.02% Impervious = 3.480 ac

Summary for Subcatchment #25: #25 Bedford Roof

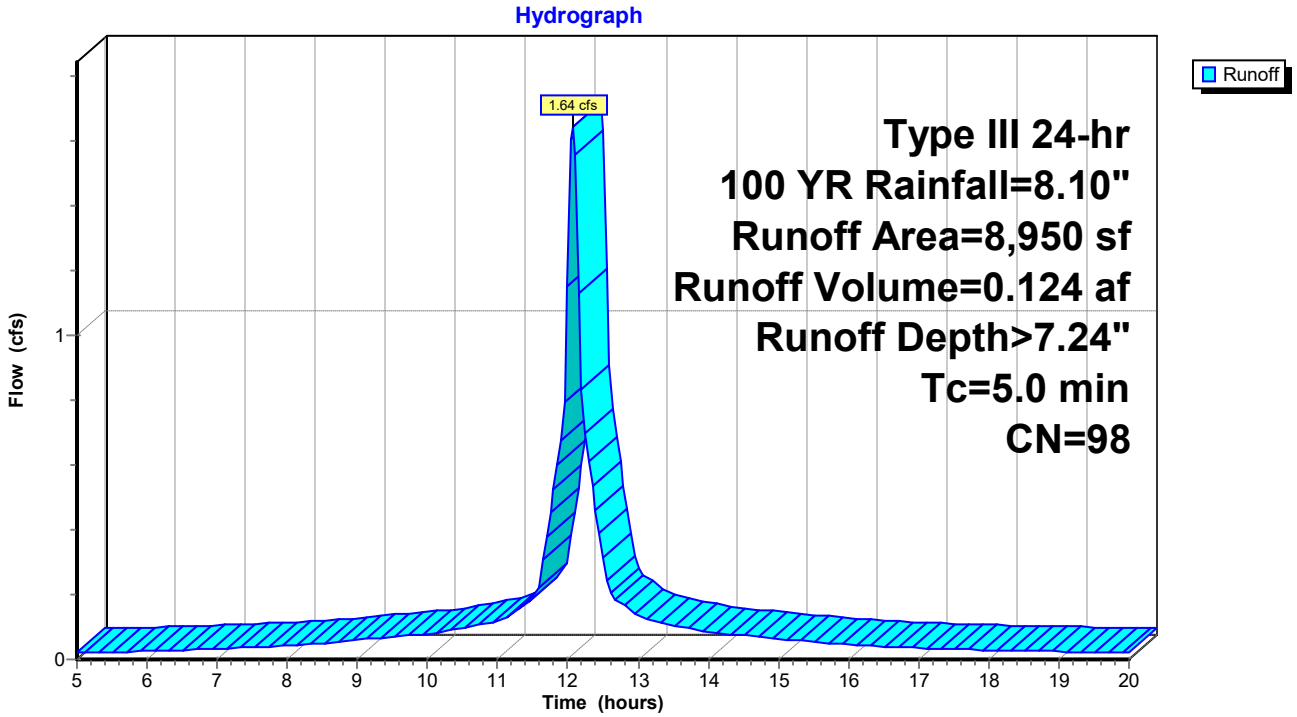
Runoff = 1.64 cfs @ 12.07 hrs, Volume= 0.124 af, Depth> 7.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

Area (sf)	CN	Description
8,950	98	Paved parking, HSG A
8,950		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #25: #25 Bedford Roof



Summary for Subcatchment #35: #35 Bedford Roof

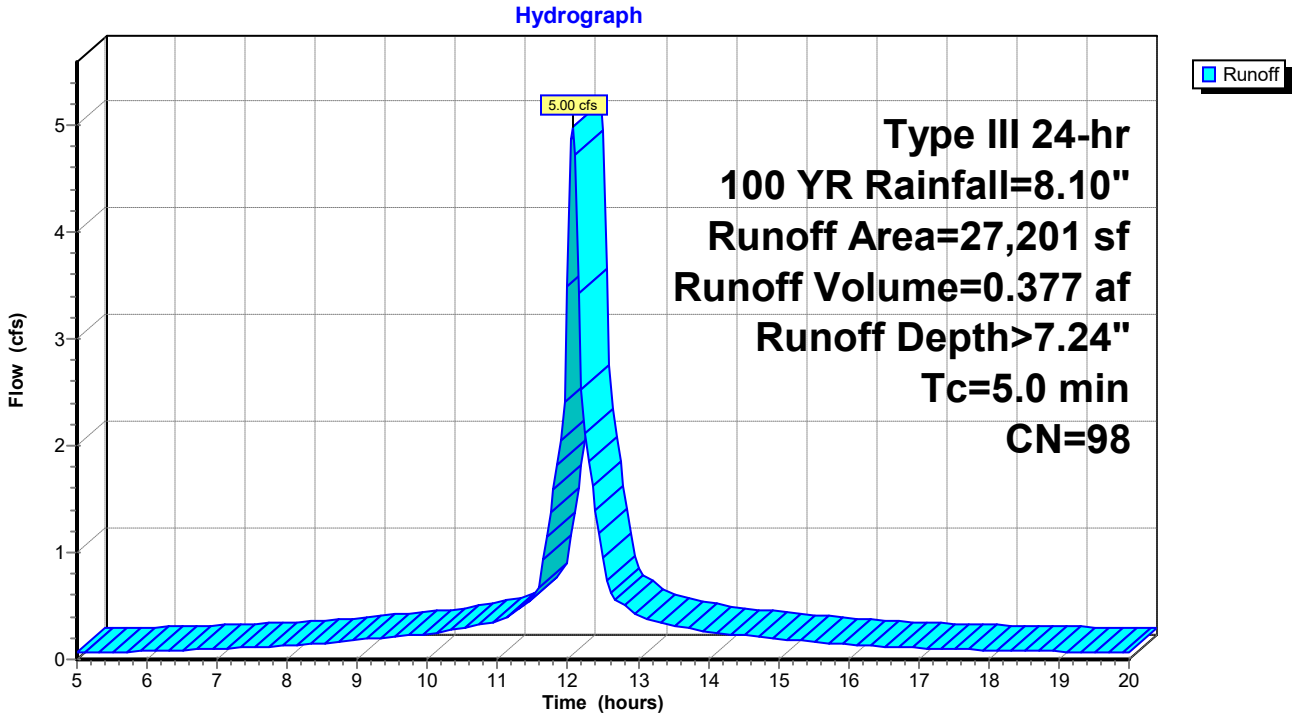
Runoff = 5.00 cfs @ 12.07 hrs, Volume= 0.377 af, Depth> 7.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

Area (sf)	CN	Description
27,201	98	Paved parking, HSG A
27,201		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment #35: #35 Bedford Roof



Summary for Subcatchment 1S: Watershed to Durham SD

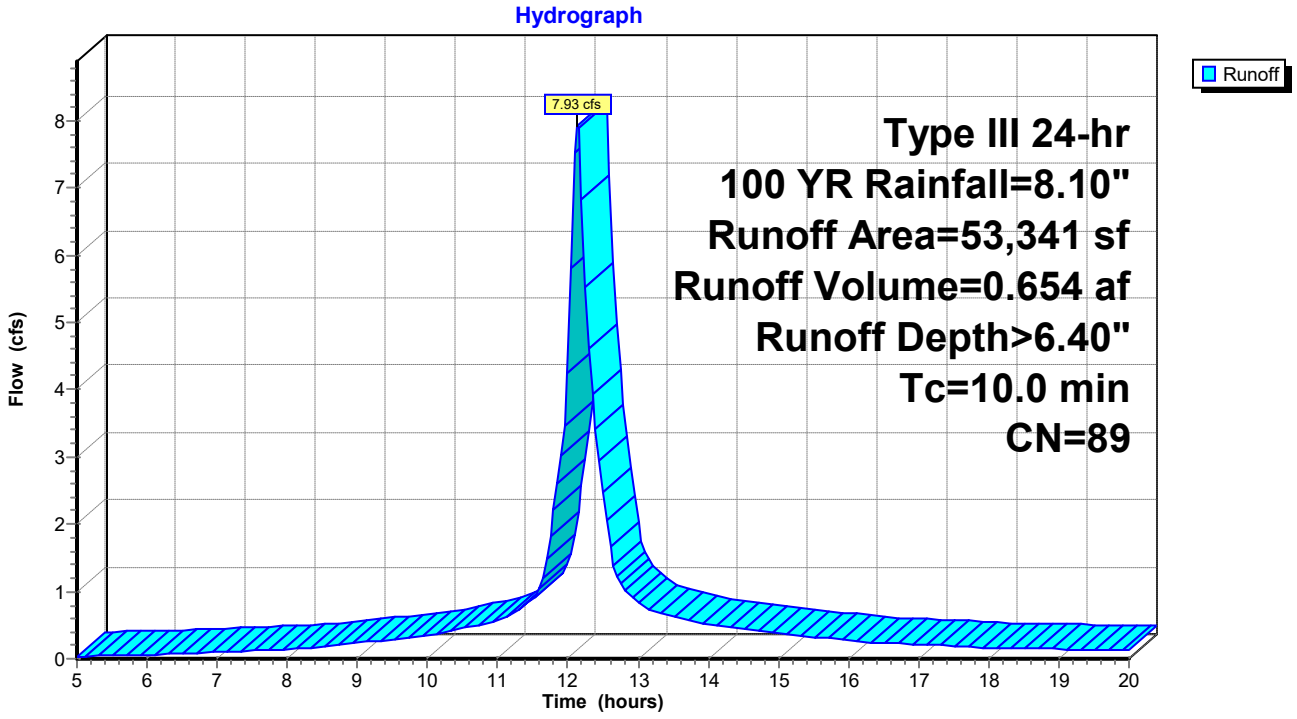
Runoff = 7.93 cfs @ 12.14 hrs, Volume= 0.654 af, Depth> 6.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

Area (sf)	CN	Description
33,152	98	Paved parking, HSG A
20,189	74	>75% Grass cover, Good, HSG C
53,341	89	Weighted Average
20,189		37.85% Pervious Area
33,152		62.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Watershed to Durham SD



Summary for Subcatchment 2S: Woodbury Parking Lot

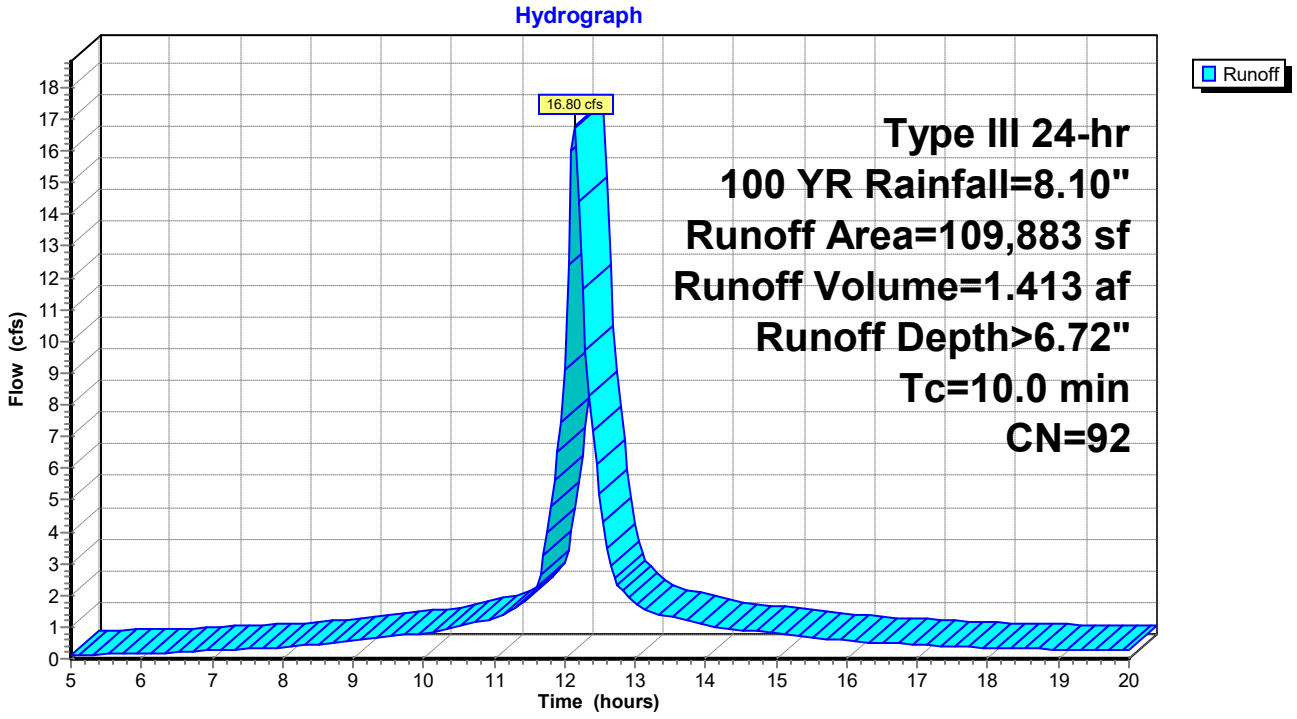
Runoff = 16.80 cfs @ 12.14 hrs, Volume= 1.413 af, Depth> 6.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

Area (sf)	CN	Description
82,271	98	Paved parking, HSG A
27,612	74	>75% Grass cover, Good, HSG C
109,883	92	Weighted Average
27,612		25.13% Pervious Area
82,271		74.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: Woodbury Parking Lot

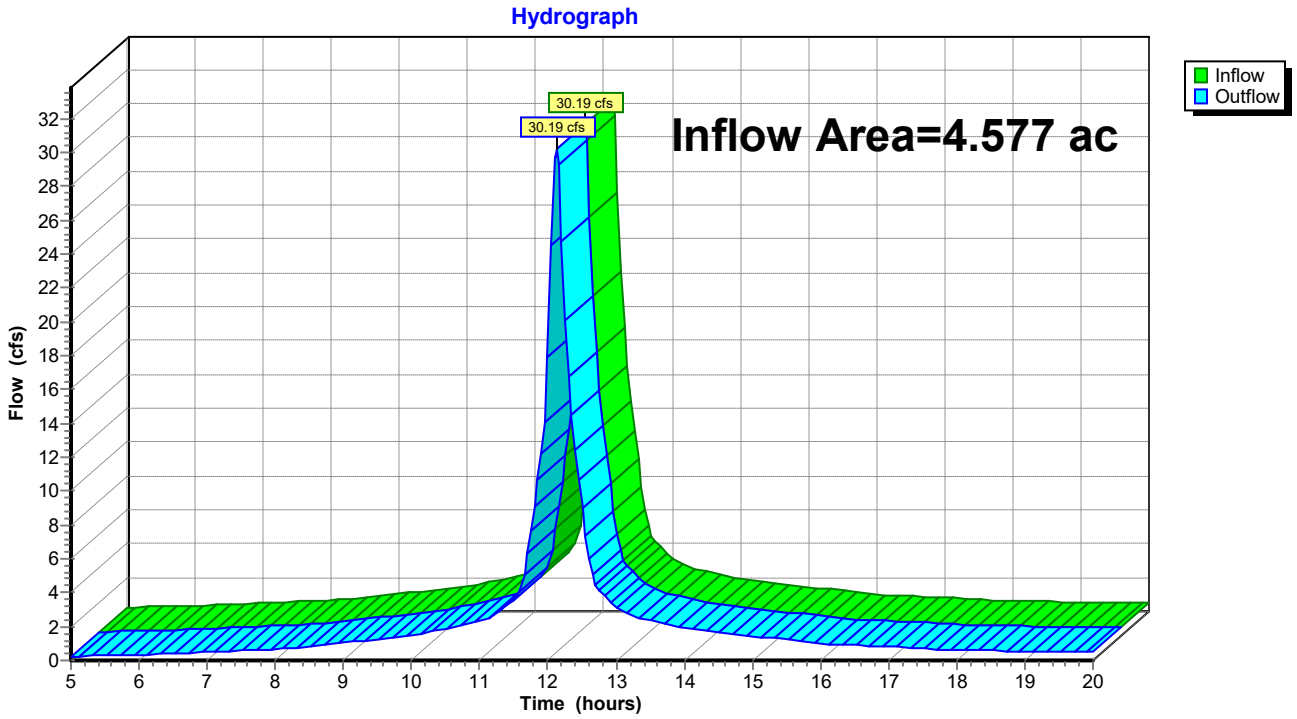


Summary for Reach 100R: POI 100

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 6.73" for 100 YR event
Inflow = 30.19 cfs @ 12.12 hrs, Volume= 2.567 af
Outflow = 30.19 cfs @ 12.12 hrs, Volume= 2.567 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 100R: POI 100



Summary for Pond 1P: Durham SD System

Inflow Area = 1.225 ac, 62.15% Impervious, Inflow Depth > 6.40" for 100 YR event
Inflow = 7.93 cfs @ 12.14 hrs, Volume= 0.654 af
Outflow = 7.93 cfs @ 12.14 hrs, Volume= 0.653 af, Atten= 0%, Lag= 0.0 min
Primary = 7.93 cfs @ 12.14 hrs, Volume= 0.653 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.79' @ 12.14 hrs Surf.Area= 9 sf Storage= 11 cf

Plug-Flow detention time= 0.1 min calculated for 0.653 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (754.9 - 754.9)

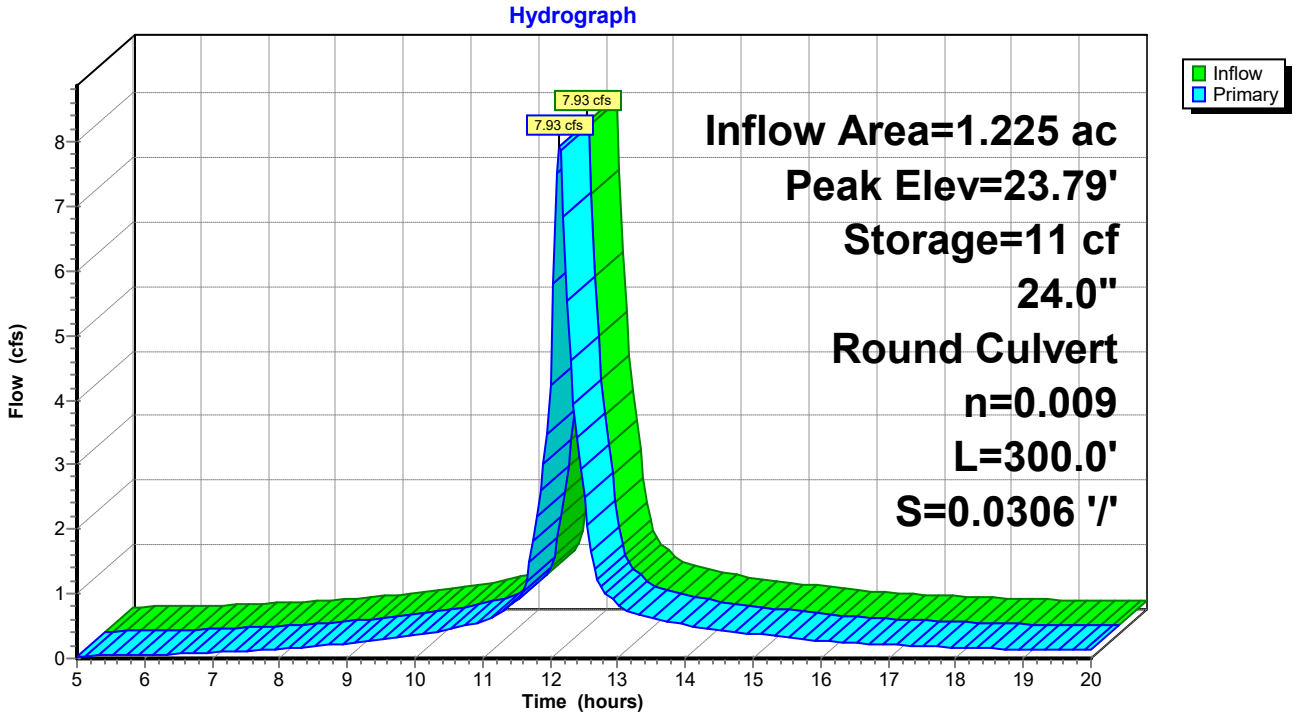
Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,591 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	100	1	51
29.00	15,000	6,040	6,091
30.00	1,000,000	507,500	513,591

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.79 cfs @ 12.14 hrs HW=23.77' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 7.79 cfs @ 3.80 fps)

Pond 1P: Durham SD System



Summary for Pond 2P: Bedford SD System

Inflow Area = 3.147 ac, 79.86% Impervious, Inflow Depth > 6.82" for 100 YR event
Inflow = 20.97 cfs @ 12.12 hrs, Volume= 1.790 af
Outflow = 20.97 cfs @ 12.12 hrs, Volume= 1.790 af, Atten= 0%, Lag= 0.0 min
Primary = 20.97 cfs @ 12.12 hrs, Volume= 1.790 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 23.74' @ 12.12 hrs Surf.Area= 9 sf Storage= 14 cf

Plug-Flow detention time= 0.0 min calculated for 1.790 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (744.9 - 744.9)

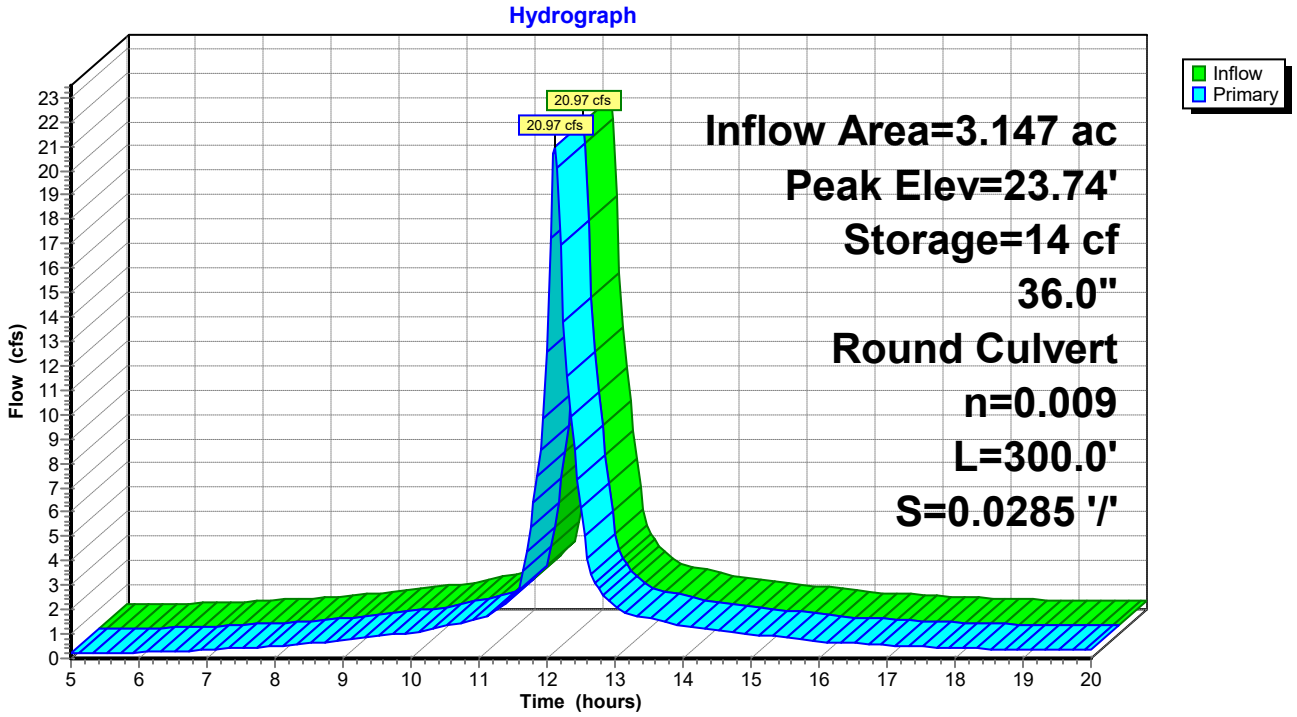
Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=20.51 cfs @ 12.12 hrs HW=23.71' (Free Discharge)
↑**1=Culvert** (Inlet Controls 20.51 cfs @ 4.59 fps)

Pond 2P: Bedford SD System



Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.577 ac, 76.02% Impervious, Inflow Depth > 6.73" for 100 YR event
Inflow = 30.23 cfs @ 12.12 hrs, Volume= 2.567 af
Outflow = 30.19 cfs @ 12.12 hrs, Volume= 2.567 af, Atten= 0%, Lag= 0.1 min
Primary = 30.19 cfs @ 12.12 hrs, Volume= 2.567 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 19.27' @ 12.12 hrs Surf.Area= 9 sf Storage= 53 cf

Plug-Flow detention time= 0.1 min calculated for 2.567 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (746.9 - 746.9)

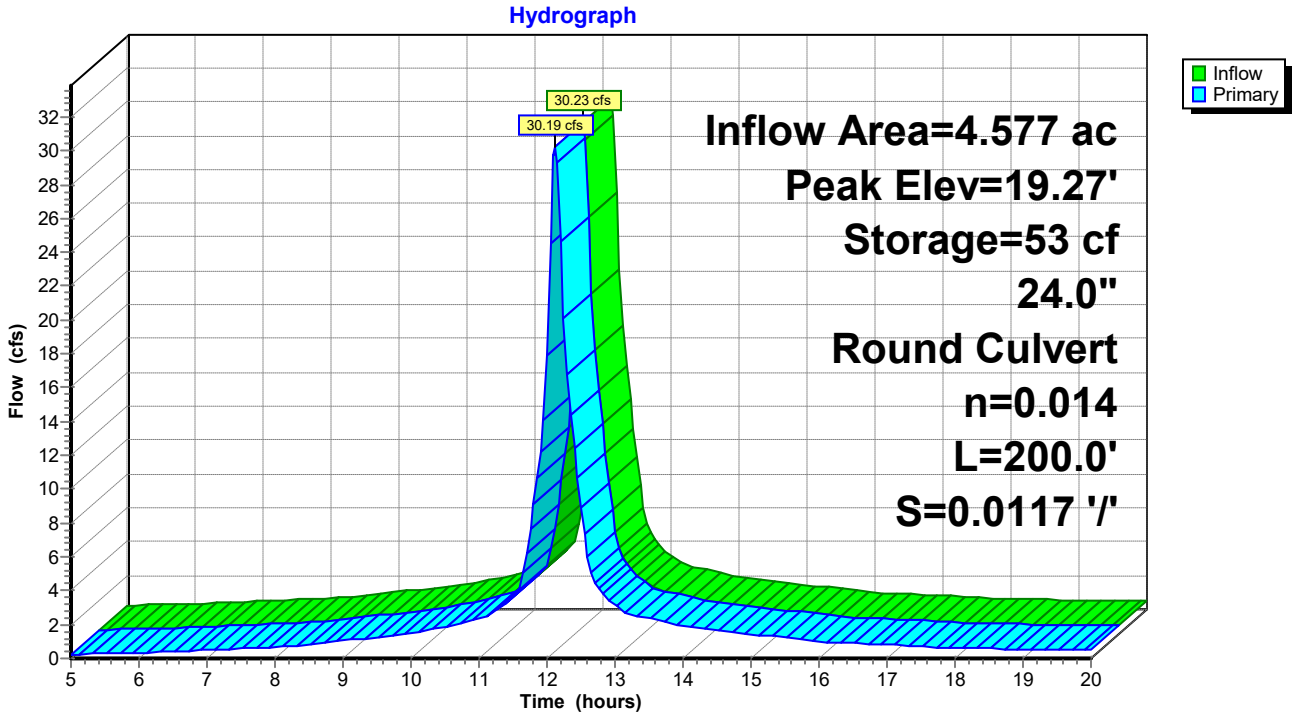
Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

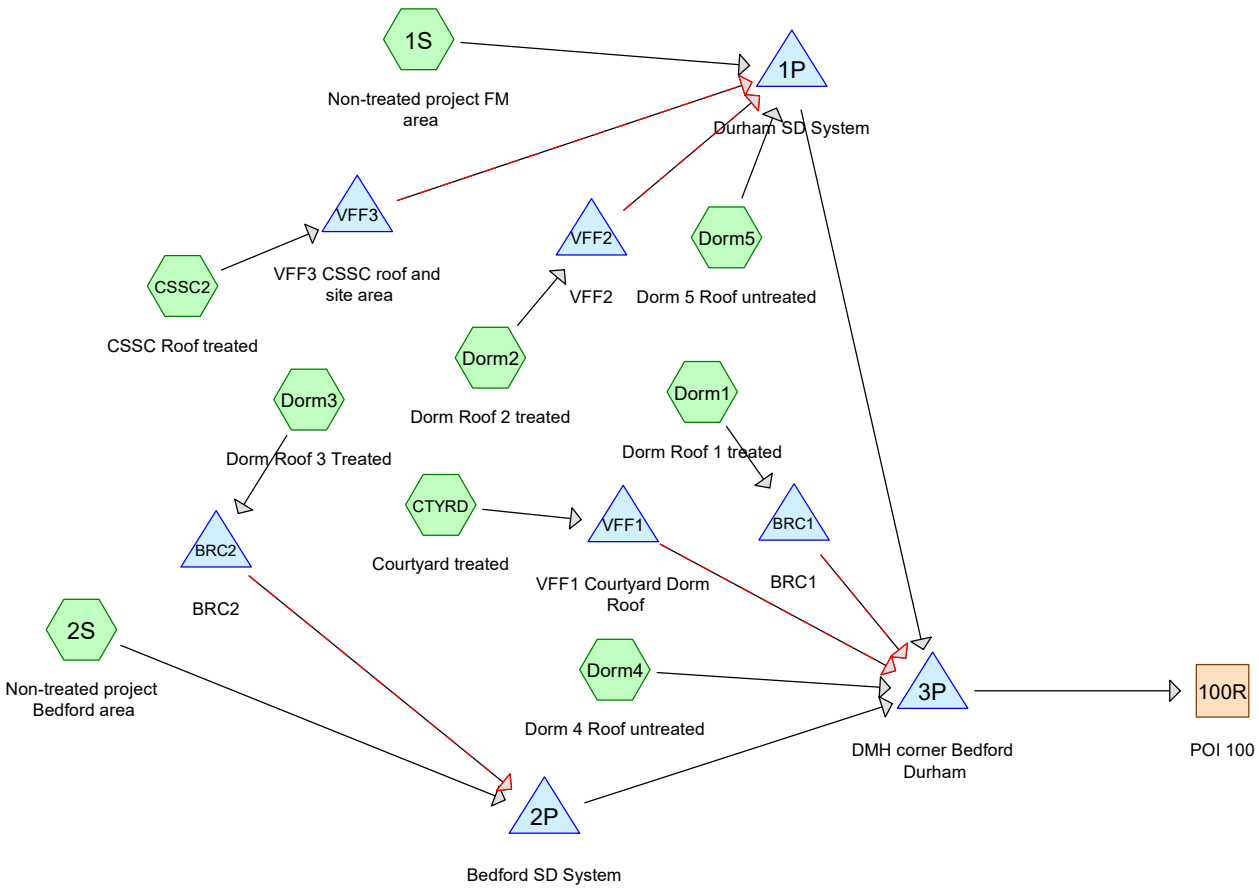
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=29.51 cfs @ 12.12 hrs HW=19.02' (Free Discharge)
1=Culvert (Barrel Controls 29.51 cfs @ 9.39 fps)

Pond 3P: DMH corner Bedford Durham





Subcat Reach Pond Link

Routing Diagram for 19206 Prop Cond 200723
Prepared by SMRT, Printed 7/26/2020
HydroCAD® 10.00-24 s/n 00729 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Non-treated project FM area

Runoff = 1.79 cfs @ 12.15 hrs, Volume= 0.148 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

Area (sf)	CN	Description
20,981	98	Paved parking, HSG A
27,303	74	>75% Grass cover, Good, HSG C
48,284	84	Weighted Average
27,303		56.55% Pervious Area
20,981		43.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment 2S: Non-treated project Bedford area

Runoff = 2.35 cfs @ 12.15 hrs, Volume= 0.194 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	25,948	98	Paved Sidewalks, hardscape
	40,467	74	>75% Grass cover, Good, HSG C
	66,415	83	Weighted Average
	40,467		60.93% Pervious Area
	25,948		39.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment CSSC2: CSSC Roof treated

Runoff = 2.19 cfs @ 12.07 hrs, Volume= 0.161 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	27,000	98	SSC Roof treated
	6,400	74	>75% Grass cover, Good, HSG C
*	1,100	98	Sidewalk
	34,500	94	Weighted Average
	6,400		18.55% Pervious Area
	28,100		81.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment CTYRD: Courtyard treated

Runoff = 0.45 cfs @ 12.08 hrs, Volume= 0.032 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
	11,850	74	>75% Grass cover, Good, HSG C
*	2,200	98	Hardscape in courtyard
	14,050	78	Weighted Average
	11,850		84.34% Pervious Area
	2,200		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm1: Dorm Roof 1 treated

Runoff = 0.64 cfs @ 12.07 hrs, Volume= 0.047 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	8,000	98	Dorm Roof treated
*	2,000	80	BRC Bed
	10,000	94	Weighted Average
	2,000		20.00% Pervious Area
	8,000		80.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm2: Dorm Roof 2 treated

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.034 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	4,000	98	Dorm Roof treated
*	7,046	74	>75% Grass cover, Good, HSG C VFF 1 area
*	450	98	Sidewalk
	11,496	83	Weighted Average
	7,046		61.29% Pervious Area
	4,450		38.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm3: Dorm Roof 3 Treated

Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.051 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	8,928	98	Dorm Roof treated
*	1,620	80	BRC bed
	10,548	95	Weighted Average
	1,620		15.36% Pervious Area
	8,928		84.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm4: Dorm 4 Roof untreated

Runoff = 0.54 cfs @ 12.07 hrs, Volume= 0.042 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	6,100	98	Dorm roof untreated
*	1,700	98	Bedford Sidewalk
	7,800	98	Weighted Average
	7,800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm5: Dorm 5 Roof untreated

Runoff = 0.37 cfs @ 12.07 hrs, Volume= 0.028 af, Depth> 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.10"

	Area (sf)	CN	Description
*	5,280	98	Dorm Roof untreated
	5,280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 100R: POI 100

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 1.59" for 2 YR event
Inflow = 5.58 cfs @ 12.14 hrs, Volume= 0.633 af
Outflow = 5.58 cfs @ 12.14 hrs, Volume= 0.633 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Durham SD System

Inflow Area = 2.286 ac, 59.07% Impervious, Inflow Depth > 1.66" for 2 YR event
Inflow = 2.22 cfs @ 12.13 hrs, Volume= 0.317 af
Outflow = 2.22 cfs @ 12.13 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min
Primary = 2.22 cfs @ 12.13 hrs, Volume= 0.317 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.15' @ 12.13 hrs Surf.Area= 9 sf Storage= 6 cf

Plug-Flow detention time= 0.2 min calculated for 0.317 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (905.5 - 905.4)

Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	500	3	53
29.00	15,000	6,200	6,253
30.00	1,000,000	507,500	513,753

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.18 cfs @ 12.13 hrs HW=23.14' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 2.18 cfs @ 2.67 fps)

Summary for Pond 2P: Bedford SD System

Inflow Area = 1.767 ac, 45.32% Impervious, Inflow Depth = 1.54" for 2 YR event
Inflow = 2.87 cfs @ 12.15 hrs, Volume= 0.226 af
Outflow = 2.87 cfs @ 12.15 hrs, Volume= 0.226 af, Atten= 0%, Lag= 0.0 min
Primary = 2.87 cfs @ 12.15 hrs, Volume= 0.226 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 22.52' @ 12.15 hrs Surf.Area= 9 sf Storage= 3 cf

Plug-Flow detention time= 0.0 min calculated for 0.226 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (842.6 - 842.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=2.87 cfs @ 12.15 hrs HW=22.52' (Free Discharge)
1=Culvert (Inlet Controls 2.87 cfs @ 2.69 fps)

Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 1.59" for 2 YR event
Inflow = 5.58 cfs @ 12.14 hrs, Volume= 0.633 af
Outflow = 5.58 cfs @ 12.14 hrs, Volume= 0.633 af, Atten= 0%, Lag= 0.0 min
Primary = 5.58 cfs @ 12.14 hrs, Volume= 0.633 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 14.37' @ 12.14 hrs Surf.Area= 9 sf Storage= 9 cf

Plug-Flow detention time= 0.2 min calculated for 0.633 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (868.3 - 868.2)

Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=5.49 cfs @ 12.14 hrs HW=14.36' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 5.49 cfs @ 3.43 fps)

Summary for Pond BRC1: BRC1

Inflow Area = 0.230 ac, 80.00% Impervious, Inflow Depth > 2.44" for 2 YR event
Inflow = 0.64 cfs @ 12.07 hrs, Volume= 0.047 af
Outflow = 0.11 cfs @ 12.54 hrs, Volume= 0.047 af, Atten= 83%, Lag= 27.9 min
Primary = 0.11 cfs @ 12.54 hrs, Volume= 0.047 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.30' @ 12.54 hrs Surf.Area= 1,922 sf Storage= 570 cf

Plug-Flow detention time= 32.3 min calculated for 0.047 af (100% of inflow)
Center-of-Mass det. time= 32.3 min (820.1 - 787.8)

Volume	Invert	Avail.Storage	Storage Description
#1	22.99'	20,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.99	1	0	0
23.00	1,800	9	9
23.50	2,002	951	960
24.00	2,200	1,051	2,010
25.00	35,000	18,600	20,610

Device	Routing	Invert	Outlet Devices
#1	Device 2	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	19.00'	**12.0" Round Culvert** L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 18.00' S= 0.0143 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Secondary	23.75'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Device 2	22.99'	**2.410 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.11 cfs @ 12.54 hrs HW=23.30' (Free Discharge)
└**2=Culvert** (Passes 0.11 cfs of 7.37 cfs potential flow)
  └**1=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.99' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond BRC2: BRC2

Inflow Area = 0.242 ac, 84.64% Impervious, Inflow Depth > 2.54" for 2 YR event
Inflow = 0.69 cfs @ 12.07 hrs, Volume= 0.051 af
Outflow = 0.52 cfs @ 12.16 hrs, Volume= 0.032 af, Atten= 25%, Lag= 5.1 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.52 cfs @ 12.16 hrs, Volume= 0.032 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.57' @ 12.16 hrs Surf.Area= 1,656 sf Storage= 958 cf

Plug-Flow detention time= 186.6 min calculated for 0.032 af (62% of inflow)
Center-of-Mass det. time= 87.0 min (869.5 - 782.5)

Volume	Invert	Avail.Storage	Storage Description
#1	28.99'	14,992 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.99	1	0	0
29.00	1,656	8	8
29.50	1,656	828	836
30.00	1,656	828	1,664
31.00	25,000	13,328	14,992

Device	Routing	Invert	Outlet Devices
#1	Primary	23.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.00' / 19.00' S= 0.0667 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Secondary	29.75'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 1	29.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	29.00'	**2.410 in/hr Exfiltration over Surface area above 29.00'** Excluded Surface area = 1,656 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.51 cfs @ 12.16 hrs HW=29.57' (Free Discharge)
└**1=Culvert** (Passes 0.51 cfs of 9.32 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.51 cfs @ 0.88 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF1: VFF1 Courtyard Dorm Roof

Inflow Area = 0.323 ac, 15.66% Impervious, Inflow Depth = 1.20" for 2 YR event
Inflow = 0.45 cfs @ 12.08 hrs, Volume= 0.032 af
Outflow = 0.01 cfs @ 22.80 hrs, Volume= 0.001 af, Atten= 98%, Lag= 643.1 min
Primary = 0.01 cfs @ 22.80 hrs, Volume= 0.001 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.50' @ 22.80 hrs Surf.Area= 1,562 sf Storage= 1,366 cf

Plug-Flow detention time= 732.5 min calculated for 0.001 af (3% of inflow)
Center-of-Mass det. time= 547.3 min (1,397.3 - 850.0)

Volume	Invert	Avail.Storage	Storage Description
#1	22.49'	22,618 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.49	1	0	0
22.50	1,080	5	5
23.00	1,395	619	624
24.00	1,728	1,562	2,186
24.50	15,000	4,182	6,368
25.00	50,000	16,250	22,618

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert X 2.00** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.65' S= 0.0713 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.50'	**110.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 22.80 hrs HW=23.50' (Free Discharge)
└**1=Culvert** (Passes 0.00 cfs of 23.27 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.13 fps)
└**3=Exfiltration** (Passes 0.00 cfs of 0.09 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.49' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF2: VFF2

Inflow Area = 0.264 ac, 38.71% Impervious, Inflow Depth = 1.53" for 2 YR event
Inflow = 0.47 cfs @ 12.08 hrs, Volume= 0.034 af
Outflow = 0.01 cfs @ 17.56 hrs, Volume= 0.005 af, Atten= 97%, Lag= 328.7 min
Primary = 0.01 cfs @ 17.56 hrs, Volume= 0.005 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.01' @ 17.56 hrs Surf.Area= 1,161 sf Storage= 1,250 cf

Plug-Flow detention time= 530.7 min calculated for 0.005 af (15% of inflow)
Center-of-Mass det. time= 379.9 min (1,213.4 - 833.5)

Volume	Invert	Avail.Storage	Storage Description
#1	22.50'	17,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.50	504	0	0
24.00	1,152	1,242	1,242
25.00	2,500	1,826	3,068
25.10	10,000	625	3,693
26.00	20,000	13,500	17,193

Device	Routing	Invert	Outlet Devices
#1	Primary	21.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.00' / 15.00' S= 0.0400 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	24.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.50'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.60'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.01 cfs @ 17.56 hrs HW=24.01' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 5.99 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.27 fps)
└**3=Exfiltration** (Passes 0.01 cfs of 0.06 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF3: VFF3 CSSC roof and site area

Inflow Area = 0.792 ac, 81.45% Impervious, Inflow Depth > 2.44" for 2 YR event
Inflow = 2.19 cfs @ 12.07 hrs, Volume= 0.161 af
Outflow = 0.17 cfs @ 13.13 hrs, Volume= 0.136 af, Atten= 92%, Lag= 63.3 min
Primary = 0.17 cfs @ 13.13 hrs, Volume= 0.136 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.06' @ 13.13 hrs Surf.Area= 3,040 sf Storage= 3,983 cf

Plug-Flow detention time= 278.1 min calculated for 0.136 af (84% of inflow)
Center-of-Mass det. time= 212.2 min (1,000.0 - 787.8)

Volume	Invert	Avail.Storage	Storage Description
#1	39.49'	13,735 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.49	1	0	0
39.50	2,000	10	10
40.00	2,400	1,100	1,110
41.00	3,000	2,700	3,810
41.50	3,350	1,588	5,398
42.00	30,000	8,338	13,735

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 24.00' S= 0.0367 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	40.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	39.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	41.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.17 cfs @ 13.13 hrs HW=41.06' (Free Discharge)
└**1=Culvert** (Passes 0.17 cfs of 8.80 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.17 cfs of 19.80 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.17 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=39.49' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 1S: Non-treated project FM area

Runoff = 3.25 cfs @ 12.14 hrs, Volume= 0.268 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

Area (sf)	CN	Description
20,981	98	Paved parking, HSG A
27,303	74	>75% Grass cover, Good, HSG C
48,284	84	Weighted Average
27,303		56.55% Pervious Area
20,981		43.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment 2S: Non-treated project Bedford area

Runoff = 4.33 cfs @ 12.14 hrs, Volume= 0.358 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	25,948	98	Paved Sidewalks, hardscape
	40,467	74	>75% Grass cover, Good, HSG C
	66,415	83	Weighted Average
	40,467		60.93% Pervious Area
	25,948		39.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment CSSC2: CSSC Roof treated

Runoff = 3.42 cfs @ 12.07 hrs, Volume= 0.257 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	27,000	98	SSC Roof treated
	6,400	74	>75% Grass cover, Good, HSG C
*	1,100	98	Sidewalk
	34,500	94	Weighted Average
	6,400		18.55% Pervious Area
	28,100		81.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment CTYRD: Courtyard treated

Runoff = 0.90 cfs @ 12.08 hrs, Volume= 0.064 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
	11,850	74	>75% Grass cover, Good, HSG C
*	2,200	98	Hardscape in courtyard
	14,050	78	Weighted Average
	11,850		84.34% Pervious Area
	2,200		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm1: Dorm Roof 1 treated

Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.074 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	8,000	98	Dorm Roof treated
*	2,000	80	BRC Bed
	10,000	94	Weighted Average
	2,000		20.00% Pervious Area
	8,000		80.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm2: Dorm Roof 2 treated

Runoff = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	4,000	98	Dorm Roof treated
*	7,046	74	>75% Grass cover, Good, HSG C VFF 1 area
*	450	98	Sidewalk
	11,496	83	Weighted Average
	7,046		61.29% Pervious Area
	4,450		38.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm3: Dorm Roof 3 Treated

Runoff = 1.06 cfs @ 12.07 hrs, Volume= 0.081 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	8,928	98	Dorm Roof treated
*	1,620	80	BRC bed
	10,548	95	Weighted Average
	1,620		15.36% Pervious Area
	8,928		84.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm4: Dorm 4 Roof untreated

Runoff = 0.81 cfs @ 12.07 hrs, Volume= 0.063 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	6,100	98	Dorm roof untreated
*	1,700	98	Bedford Sidewalk
	7,800	98	Weighted Average
	7,800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm5: Dorm 5 Roof untreated

Runoff = 0.55 cfs @ 12.07 hrs, Volume= 0.043 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.60"

	Area (sf)	CN	Description
*	5,280	98	Dorm Roof untreated
	5,280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 100R: POI 100

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 2.92" for 10 YR event
Inflow = 9.83 cfs @ 12.13 hrs, Volume= 1.166 af
Outflow = 9.83 cfs @ 12.13 hrs, Volume= 1.166 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Durham SD System

Inflow Area = 2.286 ac, 59.07% Impervious, Inflow Depth > 3.03" for 10 YR event
Inflow = 3.83 cfs @ 12.13 hrs, Volume= 0.576 af
Outflow = 3.84 cfs @ 12.13 hrs, Volume= 0.576 af, Atten= 0%, Lag= 0.0 min
Primary = 3.84 cfs @ 12.13 hrs, Volume= 0.576 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.36' @ 12.13 hrs Surf.Area= 9 sf Storage= 7 cf

Plug-Flow detention time= 0.2 min calculated for 0.576 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (905.4 - 905.3)

Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	500	3	53
29.00	15,000	6,200	6,253
30.00	1,000,000	507,500	513,753

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.77 cfs @ 12.13 hrs HW=23.35' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 3.77 cfs @ 3.09 fps)

Summary for Pond 2P: Bedford SD System

Inflow Area = 1.767 ac, 45.32% Impervious, Inflow Depth = 2.85" for 10 YR event
Inflow = 5.26 cfs @ 12.14 hrs, Volume= 0.419 af
Outflow = 5.26 cfs @ 12.14 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
Primary = 5.26 cfs @ 12.14 hrs, Volume= 0.419 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 22.76' @ 12.14 hrs Surf.Area= 9 sf Storage= 5 cf

Plug-Flow detention time= 0.0 min calculated for 0.418 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (823.0 - 822.9)

Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=5.16 cfs @ 12.14 hrs HW=22.75' (Free Discharge)
↑**1=Culvert** (Inlet Controls 5.16 cfs @ 3.14 fps)

Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 2.92" for 10 YR event
Inflow = 9.83 cfs @ 12.13 hrs, Volume= 1.166 af
Outflow = 9.83 cfs @ 12.13 hrs, Volume= 1.166 af, Atten= 0%, Lag= 0.0 min
Primary = 9.83 cfs @ 12.13 hrs, Volume= 1.166 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 14.78' @ 12.13 hrs Surf.Area= 9 sf Storage= 13 cf

Plug-Flow detention time= 0.1 min calculated for 1.164 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (865.0 - 864.9)

Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=9.65 cfs @ 12.13 hrs HW=14.77' (Free Discharge)
1=Culvert (Inlet Controls 9.65 cfs @ 4.05 fps)

Summary for Pond BRC1: BRC1

Inflow Area = 0.230 ac, 80.00% Impervious, Inflow Depth > 3.89" for 10 YR event
Inflow = 0.99 cfs @ 12.07 hrs, Volume= 0.074 af
Outflow = 0.24 cfs @ 12.46 hrs, Volume= 0.074 af, Atten= 76%, Lag= 23.3 min
Primary = 0.24 cfs @ 12.46 hrs, Volume= 0.074 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.53' @ 12.46 hrs Surf.Area= 2,013 sf Storage= 1,014 cf

Plug-Flow detention time= 58.2 min calculated for 0.074 af (100% of inflow)
Center-of-Mass det. time= 58.1 min (835.8 - 777.7)

Volume	Invert	Avail.Storage	Storage Description
#1	22.99'	20,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.99	1	0	0
23.00	1,800	9	9
23.50	2,002	951	960
24.00	2,200	1,051	2,010
25.00	35,000	18,600	20,610

Device	Routing	Invert	Outlet Devices
#1	Device 2	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	19.00'	**12.0" Round Culvert** L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 18.00' S= 0.0143 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Secondary	23.75'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Device 2	22.99'	**2.410 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.23 cfs @ 12.46 hrs HW=23.53' (Free Discharge)
└**2=Culvert** (Passes 0.23 cfs of 7.59 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 0.12 cfs @ 0.54 fps)
  └**4=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.99' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond BRC2: BRC2

Inflow Area = 0.242 ac, 84.64% Impervious, Inflow Depth > 3.99" for 10 YR event
Inflow = 1.06 cfs @ 12.07 hrs, Volume= 0.081 af
Outflow = 0.98 cfs @ 12.11 hrs, Volume= 0.061 af, Atten= 7%, Lag= 2.2 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.98 cfs @ 12.11 hrs, Volume= 0.061 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.61' @ 12.11 hrs Surf.Area= 1,656 sf Storage= 1,022 cf

Plug-Flow detention time= 145.2 min calculated for 0.061 af (76% of inflow)
Center-of-Mass det. time= 62.9 min (836.7 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	28.99'	14,992 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.99	1	0	0
29.00	1,656	8	8
29.50	1,656	828	836
30.00	1,656	828	1,664
31.00	25,000	13,328	14,992

Device	Routing	Invert	Outlet Devices
#1	Primary	23.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.00' / 19.00' S= 0.0667 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Secondary	29.75'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 1	29.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	29.00'	**2.410 in/hr Exfiltration over Surface area above 29.00'** Excluded Surface area = 1,656 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
↑└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.97 cfs @ 12.11 hrs HW=29.61' (Free Discharge)
↑└**1=Culvert** (Passes 0.97 cfs of 9.35 cfs potential flow)
↑└**3=Orifice/Grate** (Weir Controls 0.97 cfs @ 1.09 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
↑└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF1: VFF1 Courtyard Dorm Roof

Inflow Area = 0.323 ac, 15.66% Impervious, Inflow Depth = 2.38" for 10 YR event
Inflow = 0.90 cfs @ 12.08 hrs, Volume= 0.064 af
Outflow = 0.09 cfs @ 13.02 hrs, Volume= 0.033 af, Atten= 90%, Lag= 56.3 min
Primary = 0.09 cfs @ 13.02 hrs, Volume= 0.033 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.58' @ 13.02 hrs Surf.Area= 1,590 sf Storage= 1,496 cf

Plug-Flow detention time= 242.4 min calculated for 0.033 af (51% of inflow)
Center-of-Mass det. time= 124.9 min (954.9 - 830.0)

Volume	Invert	Avail.Storage	Storage Description
#1	22.49'	22,618 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.49	1	0	0
22.50	1,080	5	5
23.00	1,395	619	624
24.00	1,728	1,562	2,186
24.50	15,000	4,182	6,368
25.00	50,000	16,250	22,618

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert X 2.00** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.65' S= 0.0713 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.50'	**110.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.09 cfs @ 13.02 hrs HW=23.58' (Free Discharge)
└**1=Culvert** (Passes 0.09 cfs of 23.51 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.09 cfs of 1.28 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.09 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.49' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF2: VFF2

Inflow Area = 0.264 ac, 38.71% Impervious, Inflow Depth = 2.81" for 10 YR event
Inflow = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af
Outflow = 0.08 cfs @ 13.02 hrs, Volume= 0.033 af, Atten= 91%, Lag= 56.8 min
Primary = 0.08 cfs @ 13.02 hrs, Volume= 0.033 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.21' @ 13.02 hrs Surf.Area= 1,435 sf Storage= 1,514 cf

Plug-Flow detention time= 241.3 min calculated for 0.033 af (54% of inflow)
Center-of-Mass det. time= 130.3 min (946.3 - 815.9)

Volume	Invert	Avail.Storage	Storage Description
#1	22.50'	17,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.50	504	0	0
24.00	1,152	1,242	1,242
25.00	2,500	1,826	3,068
25.10	10,000	625	3,693
26.00	20,000	13,500	17,193

Device	Routing	Invert	Outlet Devices
#1	Primary	21.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.00' / 15.00' S= 0.0400 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	24.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.50'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.60'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 13.02 hrs HW=24.21' (Free Discharge)
└**1=Culvert** (Passes 0.08 cfs of 6.23 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.08 cfs of 2.51 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF3: VFF3 CSSC roof and site area

Inflow Area = 0.792 ac, 81.45% Impervious, Inflow Depth > 3.89" for 10 YR event
Inflow = 3.42 cfs @ 12.07 hrs, Volume= 0.257 af
Outflow = 0.94 cfs @ 12.42 hrs, Volume= 0.231 af, Atten= 72%, Lag= 21.0 min
Primary = 0.31 cfs @ 12.42 hrs, Volume= 0.211 af
Secondary = 0.63 cfs @ 12.42 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.54' @ 12.42 hrs Surf.Area= 5,521 sf Storage= 5,578 cf

Plug-Flow detention time= 298.8 min calculated for 0.231 af (90% of inflow)
Center-of-Mass det. time= 250.1 min (1,027.8 - 777.7)

Volume	Invert	Avail.Storage	Storage Description
#1	39.49'	13,735 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.49	1	0	0
39.50	2,000	10	10
40.00	2,400	1,100	1,110
41.00	3,000	2,700	3,810
41.50	3,350	1,588	5,398
42.00	30,000	8,338	13,735

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 24.00' S= 0.0367 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	40.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	39.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	41.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.42 hrs HW=41.54' (Free Discharge)
└**1=Culvert** (Passes 0.30 cfs of 8.93 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.30 cfs of 23.90 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.30 cfs)

Secondary OutFlow Max=0.59 cfs @ 12.42 hrs HW=41.54' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.59 cfs @ 0.50 fps)

Summary for Subcatchment 1S: Non-treated project FM area

Runoff = 4.44 cfs @ 12.14 hrs, Volume= 0.370 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

Area (sf)	CN	Description
20,981	98	Paved parking, HSG A
27,303	74	>75% Grass cover, Good, HSG C
48,284	84	Weighted Average
27,303		56.55% Pervious Area
20,981		43.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment 2S: Non-treated project Bedford area

Runoff = 5.97 cfs @ 12.14 hrs, Volume= 0.496 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	25,948	98	Paved Sidewalks, hardscape
	40,467	74	>75% Grass cover, Good, HSG C
	66,415	83	Weighted Average
	40,467		60.93% Pervious Area
	25,948		39.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment CSSC2: CSSC Roof treated

Runoff = 4.39 cfs @ 12.07 hrs, Volume= 0.334 af, Depth> 5.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	27,000	98	SSC Roof treated
	6,400	74	>75% Grass cover, Good, HSG C
*	1,100	98	Sidewalk
	34,500	94	Weighted Average
	6,400		18.55% Pervious Area
	28,100		81.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment CTYRD: Courtyard treated

Runoff = 1.29 cfs @ 12.08 hrs, Volume= 0.091 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
	11,850	74	>75% Grass cover, Good, HSG C
*	2,200	98	Hardscape in courtyard
	14,050	78	Weighted Average
	11,850		84.34% Pervious Area
	2,200		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm1: Dorm Roof 1 treated

Runoff = 1.27 cfs @ 12.07 hrs, Volume= 0.097 af, Depth> 5.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	8,000	98	Dorm Roof treated
*	2,000	80	BRC Bed
	10,000	94	Weighted Average
	2,000		20.00% Pervious Area
	8,000		80.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm2: Dorm Roof 2 treated

Runoff = 1.20 cfs @ 12.07 hrs, Volume= 0.086 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	4,000	98	Dorm Roof treated
*	7,046	74	>75% Grass cover, Good, HSG C VFF 1 area
*	450	98	Sidewalk
	11,496	83	Weighted Average
	7,046		61.29% Pervious Area
	4,450		38.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm3: Dorm Roof 3 Treated

Runoff = 1.36 cfs @ 12.07 hrs, Volume= 0.104 af, Depth> 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	8,928	98	Dorm Roof treated
*	1,620	80	BRC bed
	10,548	95	Weighted Average
	1,620		15.36% Pervious Area
	8,928		84.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm4: Dorm 4 Roof untreated

Runoff = 1.02 cfs @ 12.07 hrs, Volume= 0.081 af, Depth> 5.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	6,100	98	Dorm roof untreated
*	1,700	98	Bedford Sidewalk
	7,800	98	Weighted Average
	7,800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm5: Dorm 5 Roof untreated

Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.055 af, Depth> 5.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.80"

	Area (sf)	CN	Description
*	5,280	98	Dorm Roof untreated
	5,280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 100R: POI 100

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 4.04" for 25 YR event
Inflow = 15.19 cfs @ 12.16 hrs, Volume= 1.609 af
Outflow = 15.19 cfs @ 12.16 hrs, Volume= 1.609 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Durham SD System

Inflow Area = 2.286 ac, 59.07% Impervious, Inflow Depth > 4.15" for 25 YR event
Inflow = 7.17 cfs @ 12.17 hrs, Volume= 0.790 af
Outflow = 7.16 cfs @ 12.17 hrs, Volume= 0.790 af, Atten= 0%, Lag= 0.0 min
Primary = 7.16 cfs @ 12.17 hrs, Volume= 0.790 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.71' @ 12.17 hrs Surf.Area= 9 sf Storage= 11 cf

Plug-Flow detention time= 0.1 min calculated for 0.789 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (885.7 - 885.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	500	3	53
29.00	15,000	6,200	6,253
30.00	1,000,000	507,500	513,753

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.90 cfs @ 12.17 hrs HW=23.69' (Free Discharge)
1=Culvert (Inlet Controls 6.90 cfs @ 3.66 fps)

Summary for Pond 2P: Bedford SD System

Inflow Area = 1.767 ac, 45.32% Impervious, Inflow Depth = 3.95" for 25 YR event
Inflow = 7.15 cfs @ 12.13 hrs, Volume= 0.581 af
Outflow = 7.15 cfs @ 12.13 hrs, Volume= 0.581 af, Atten= 0%, Lag= 0.0 min
Primary = 7.15 cfs @ 12.13 hrs, Volume= 0.581 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 22.91' @ 12.13 hrs Surf.Area= 9 sf Storage= 7 cf

Plug-Flow detention time= 0.0 min calculated for 0.580 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (813.2 - 813.2)

Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=7.01 cfs @ 12.13 hrs HW=22.90' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 7.01 cfs @ 3.40 fps)

Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 4.04" for 25 YR event
Inflow = 15.20 cfs @ 12.16 hrs, Volume= 1.609 af
Outflow = 15.19 cfs @ 12.16 hrs, Volume= 1.609 af, Atten= 0%, Lag= 0.0 min
Primary = 15.19 cfs @ 12.16 hrs, Volume= 1.609 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 15.35' @ 12.16 hrs Surf.Area= 9 sf Storage= 18 cf

Plug-Flow detention time= 0.1 min calculated for 1.607 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (852.9 - 852.9)

Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=15.01 cfs @ 12.16 hrs HW=15.33' (Free Discharge)
1=Culvert (Inlet Controls 15.01 cfs @ 4.79 fps)

Summary for Pond BRC1: BRC1

Inflow Area = 0.230 ac, 80.00% Impervious, Inflow Depth > 5.05" for 25 YR event
Inflow = 1.27 cfs @ 12.07 hrs, Volume= 0.097 af
Outflow = 0.58 cfs @ 12.25 hrs, Volume= 0.097 af, Atten= 54%, Lag= 10.5 min
Primary = 0.58 cfs @ 12.25 hrs, Volume= 0.097 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.57' @ 12.25 hrs Surf.Area= 2,029 sf Storage= 1,097 cf

Plug-Flow detention time= 53.9 min calculated for 0.097 af (100% of inflow)
Center-of-Mass det. time= 53.7 min (826.8 - 773.1)

Volume	Invert	Avail.Storage	Storage Description
#1	22.99'	20,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.99	1	0	0
23.00	1,800	9	9
23.50	2,002	951	960
24.00	2,200	1,051	2,010
25.00	35,000	18,600	20,610

Device	Routing	Invert	Outlet Devices
#1	Device 2	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	19.00'	**12.0" Round Culvert** L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 18.00' S= 0.0143 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Secondary	23.75'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Device 2	22.99'	**2.410 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.57 cfs @ 12.25 hrs HW=23.57' (Free Discharge)
└**2=Culvert** (Passes 0.57 cfs of 7.63 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 0.46 cfs @ 0.85 fps)
  └**4=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.99' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond BRC2: BRC2

Inflow Area = 0.242 ac, 84.64% Impervious, Inflow Depth > 5.15" for 25 YR event
Inflow = 1.36 cfs @ 12.07 hrs, Volume= 0.104 af
Outflow = 1.27 cfs @ 12.11 hrs, Volume= 0.085 af, Atten= 6%, Lag= 2.1 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 1.27 cfs @ 12.11 hrs, Volume= 0.085 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.63' @ 12.11 hrs Surf.Area= 1,656 sf Storage= 1,057 cf

Plug-Flow detention time= 126.1 min calculated for 0.085 af (81% of inflow)
Center-of-Mass det. time= 54.8 min (824.7 - 769.9)

Volume	Invert	Avail.Storage	Storage Description
#1	28.99'	14,992 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.99	1	0	0
29.00	1,656	8	8
29.50	1,656	828	836
30.00	1,656	828	1,664
31.00	25,000	13,328	14,992

Device	Routing	Invert	Outlet Devices
#1	Primary	23.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.00' / 19.00' S= 0.0667 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Secondary	29.75'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 1	29.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	29.00'	**2.410 in/hr Exfiltration over Surface area above 29.00'** Excluded Surface area = 1,656 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
↑└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=1.25 cfs @ 12.11 hrs HW=29.63' (Free Discharge)
↑└**1=Culvert** (Passes 1.25 cfs of 9.36 cfs potential flow)
↑└**3=Orifice/Grate** (Weir Controls 1.25 cfs @ 1.19 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
↑└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF1: VFF1 Courtyard Dorm Roof

Inflow Area = 0.323 ac, 15.66% Impervious, Inflow Depth = 3.40" for 25 YR event
Inflow = 1.29 cfs @ 12.08 hrs, Volume= 0.091 af
Outflow = 0.11 cfs @ 13.12 hrs, Volume= 0.060 af, Atten= 91%, Lag= 62.8 min
Primary = 0.11 cfs @ 13.12 hrs, Volume= 0.060 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.01' @ 13.12 hrs Surf.Area= 2,001 sf Storage= 2,205 cf

Plug-Flow detention time= 250.9 min calculated for 0.060 af (66% of inflow)
Center-of-Mass det. time= 150.5 min (970.1 - 819.7)

Volume	Invert	Avail.Storage	Storage Description
#1	22.49'	22,618 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.49	1	0	0
22.50	1,080	5	5
23.00	1,395	619	624
24.00	1,728	1,562	2,186
24.50	15,000	4,182	6,368
25.00	50,000	16,250	22,618

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert X 2.00** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.65' S= 0.0713 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.50'	**110.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.11 cfs @ 13.12 hrs HW=24.01' (Free Discharge)
└**1=Culvert** (Passes 0.11 cfs of 24.75 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.11 cfs of 19.07 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.49' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF2: VFF2

Inflow Area = 0.264 ac, 38.71% Impervious, Inflow Depth = 3.91" for 25 YR event
Inflow = 1.20 cfs @ 12.07 hrs, Volume= 0.086 af
Outflow = 0.11 cfs @ 13.02 hrs, Volume= 0.057 af, Atten= 91%, Lag= 56.5 min
Primary = 0.11 cfs @ 13.02 hrs, Volume= 0.057 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.57' @ 13.02 hrs Surf.Area= 1,922 sf Storage= 2,120 cf

Plug-Flow detention time= 247.3 min calculated for 0.057 af (67% of inflow)
Center-of-Mass det. time= 149.7 min (956.3 - 806.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.50'	17,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.50	504	0	0
24.00	1,152	1,242	1,242
25.00	2,500	1,826	3,068
25.10	10,000	625	3,693
26.00	20,000	13,500	17,193

Device	Routing	Invert	Outlet Devices
#1	Primary	21.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.00' / 15.00' S= 0.0400 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	24.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.50'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.60'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.11 cfs @ 13.02 hrs HW=24.57' (Free Discharge)
↑**1=Culvert** (Passes 0.11 cfs of 6.63 cfs potential flow)
↑**2=Orifice/Grate** (Passes 0.11 cfs of 11.30 cfs potential flow)
↑**3=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.50' (Free Discharge)
↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF3: VFF3 CSSC roof and site area

Inflow Area = 0.792 ac, 81.45% Impervious, Inflow Depth > 5.05" for 25 YR event
Inflow = 4.39 cfs @ 12.07 hrs, Volume= 0.334 af
Outflow = 2.39 cfs @ 12.21 hrs, Volume= 0.308 af, Atten= 45%, Lag= 8.2 min
Primary = 0.45 cfs @ 12.21 hrs, Volume= 0.242 af
Secondary = 1.94 cfs @ 12.21 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.59' @ 12.21 hrs Surf.Area= 8,008 sf Storage= 5,894 cf

Plug-Flow detention time= 254.4 min calculated for 0.308 af (92% of inflow)
Center-of-Mass det. time= 214.1 min (987.2 - 773.1)

Volume	Invert	Avail.Storage	Storage Description
#1	39.49'	13,735 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.49	1	0	0
39.50	2,000	10	10
40.00	2,400	1,100	1,110
41.00	3,000	2,700	3,810
41.50	3,350	1,588	5,398
42.00	30,000	8,338	13,735

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 24.00' S= 0.0367 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	40.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	39.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	41.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.44 cfs @ 12.21 hrs HW=41.59' (Free Discharge)
└**1=Culvert** (Passes 0.44 cfs of 8.94 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.44 cfs of 24.26 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.44 cfs)

Secondary OutFlow Max=1.90 cfs @ 12.21 hrs HW=41.59' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 1.90 cfs @ 0.73 fps)

Summary for Subcatchment 1S: Non-treated project FM area

Runoff = 6.73 cfs @ 12.14 hrs, Volume= 0.572 af, Depth> 6.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

Area (sf)	CN	Description
20,981	98	Paved parking, HSG A
27,303	74	>75% Grass cover, Good, HSG C
48,284	84	Weighted Average
27,303		56.55% Pervious Area
20,981		43.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment 2S: Non-treated project Bedford area

Runoff = 9.12 cfs @ 12.14 hrs, Volume= 0.772 af, Depth> 6.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	25,948	98	Paved Sidewalks, hardscape
	40,467	74	>75% Grass cover, Good, HSG C
	66,415	83	Weighted Average
	40,467		60.93% Pervious Area
	25,948		39.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment CSSC2: CSSC Roof treated

Runoff = 6.23 cfs @ 12.07 hrs, Volume= 0.480 af, Depth> 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	27,000	98	SSC Roof treated
	6,400	74	>75% Grass cover, Good, HSG C
*	1,100	98	Sidewalk
	34,500	94	Weighted Average
	6,400		18.55% Pervious Area
	28,100		81.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment CTYRD: Courtyard treated

Runoff = 2.06 cfs @ 12.07 hrs, Volume= 0.147 af, Depth= 5.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
	11,850	74	>75% Grass cover, Good, HSG C
*	2,200	98	Hardscape in courtyard
	14,050	78	Weighted Average
	11,850		84.34% Pervious Area
	2,200		15.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm1: Dorm Roof 1 treated

Runoff = 1.80 cfs @ 12.07 hrs, Volume= 0.139 af, Depth> 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	8,000	98	Dorm Roof treated
*	2,000	80	BRC Bed
	10,000	94	Weighted Average
	2,000		20.00% Pervious Area
	8,000		80.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm2: Dorm Roof 2 treated

Runoff = 1.84 cfs @ 12.07 hrs, Volume= 0.134 af, Depth> 6.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	4,000	98	Dorm Roof treated
*	7,046	74	>75% Grass cover, Good, HSG C VFF 1 area
*	450	98	Sidewalk
	11,496	83	Weighted Average
	7,046		61.29% Pervious Area
	4,450		38.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm3: Dorm Roof 3 Treated

Runoff = 1.92 cfs @ 12.07 hrs, Volume= 0.149 af, Depth> 7.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	8,928	98	Dorm Roof treated
*	1,620	80	BRC bed
	10,548	95	Weighted Average
	1,620		15.36% Pervious Area
	8,928		84.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm4: Dorm 4 Roof untreated

Runoff = 1.43 cfs @ 12.07 hrs, Volume= 0.113 af, Depth> 7.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	6,100	98	Dorm roof untreated
*	1,700	98	Bedford Sidewalk
	7,800	98	Weighted Average
	7,800		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment Dorm5: Dorm 5 Roof untreated

Runoff = 0.97 cfs @ 12.07 hrs, Volume= 0.077 af, Depth> 7.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.10"

	Area (sf)	CN	Description
*	5,280	98	Dorm Roof untreated
	5,280		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 100R: POI 100

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 6.22" for 100 YR event
Inflow = 27.54 cfs @ 12.14 hrs, Volume= 2.478 af
Outflow = 27.54 cfs @ 12.14 hrs, Volume= 2.478 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Durham SD System

Inflow Area = 2.286 ac, 59.07% Impervious, Inflow Depth > 6.34" for 100 YR event
Inflow = 13.92 cfs @ 12.14 hrs, Volume= 1.208 af
Outflow = 13.93 cfs @ 12.14 hrs, Volume= 1.208 af, Atten= 0%, Lag= 0.0 min
Primary = 13.93 cfs @ 12.14 hrs, Volume= 1.208 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.37' @ 12.14 hrs Surf.Area= 9 sf Storage= 17 cf

Plug-Flow detention time= 0.2 min calculated for 1.208 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (858.5 - 858.5)

Volume	Invert	Avail.Storage	Storage Description
#1	22.53'	513,753 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.53	9	0	0
28.19	9	51	51
28.20	500	3	53
29.00	15,000	6,200	6,253
30.00	1,000,000	507,500	513,753

Device	Routing	Invert	Outlet Devices
#1	Primary	22.53'	**24.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.53' / 13.35' S= 0.0306 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=13.73 cfs @ 12.14 hrs HW=24.34' (Free Discharge)
↑**1=Culvert** (Inlet Controls 13.73 cfs @ 4.59 fps)

Summary for Pond 2P: Bedford SD System

Inflow Area = 1.767 ac, 45.32% Impervious, Inflow Depth > 6.12" for 100 YR event
Inflow = 10.79 cfs @ 12.13 hrs, Volume= 0.901 af
Outflow = 10.79 cfs @ 12.13 hrs, Volume= 0.901 af, Atten= 0%, Lag= 0.0 min
Primary = 10.79 cfs @ 12.13 hrs, Volume= 0.901 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.16' @ 12.13 hrs Surf.Area= 9 sf Storage= 9 cf

Plug-Flow detention time= 0.1 min calculated for 0.901 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (800.6 - 800.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.18'	559,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.18	9	0	0
27.72	9	50	50
27.82	5,000	250	300
28.00	100,000	9,450	9,750
29.00	1,000,000	550,000	559,750

Device	Routing	Invert	Outlet Devices
#1	Primary	21.90'	**36.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.90' / 13.35' S= 0.0285 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=10.58 cfs @ 12.13 hrs HW=23.15' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 10.58 cfs @ 3.80 fps)

Summary for Pond 3P: DMH corner Bedford Durham

Inflow Area = 4.784 ac, 53.60% Impervious, Inflow Depth > 6.22" for 100 YR event
Inflow = 27.52 cfs @ 12.14 hrs, Volume= 2.478 af
Outflow = 27.54 cfs @ 12.14 hrs, Volume= 2.478 af, Atten= 0%, Lag= 0.1 min
Primary = 27.54 cfs @ 12.14 hrs, Volume= 2.478 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 18.23' @ 12.14 hrs Surf.Area= 9 sf Storage= 44 cf

Plug-Flow detention time= 0.1 min calculated for 2.475 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (833.7 - 833.7)

Volume	Invert	Avail.Storage	Storage Description
#1	13.35'	607,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.35	9	0	0
21.96	9	77	77
22.00	15,000	300	378
23.00	100,000	57,500	57,878
24.00	1,000,000	550,000	607,878

Device	Routing	Invert	Outlet Devices
#1	Primary	13.35'	**24.0" Round Culvert** L= 200.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 13.35' / 11.00' S= 0.0117 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=27.02 cfs @ 12.14 hrs HW=18.04' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 27.02 cfs @ 8.60 fps)

Summary for Pond BRC1: BRC1

Inflow Area = 0.230 ac, 80.00% Impervious, Inflow Depth > 7.27" for 100 YR event
Inflow = 1.80 cfs @ 12.07 hrs, Volume= 0.139 af
Outflow = 1.48 cfs @ 12.13 hrs, Volume= 0.139 af, Atten= 18%, Lag= 3.8 min
Primary = 1.48 cfs @ 12.13 hrs, Volume= 0.139 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.64' @ 12.13 hrs Surf.Area= 2,057 sf Storage= 1,243 cf

Plug-Flow detention time= 49.0 min calculated for 0.139 af (100% of inflow)
Center-of-Mass det. time= 48.9 min (816.8 - 767.9)

Volume	Invert	Avail.Storage	Storage Description
#1	22.99'	20,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.99	1	0	0
23.00	1,800	9	9
23.50	2,002	951	960
24.00	2,200	1,051	2,010
25.00	35,000	18,600	20,610

Device	Routing	Invert	Outlet Devices
#1	Device 2	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	19.00'	**12.0" Round Culvert** L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 18.00' S= 0.0143 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Secondary	23.75'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Device 2	22.99'	**2.410 in/hr Exfiltration over Surface area**

Primary OutFlow Max=1.44 cfs @ 12.13 hrs HW=23.64' (Free Discharge)
└**2=Culvert** (Passes 1.44 cfs of 7.69 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 1.32 cfs @ 1.21 fps)
  └**4=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.99' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond BRC2: BRC2

Inflow Area = 0.242 ac, 84.64% Impervious, Inflow Depth > 7.37" for 100 YR event
Inflow = 1.92 cfs @ 12.07 hrs, Volume= 0.149 af
Outflow = 1.82 cfs @ 12.10 hrs, Volume= 0.129 af, Atten= 5%, Lag= 1.9 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 1.82 cfs @ 12.10 hrs, Volume= 0.129 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.67' @ 12.10 hrs Surf.Area= 1,656 sf Storage= 1,116 cf

Plug-Flow detention time= 102.9 min calculated for 0.129 af (87% of inflow)
Center-of-Mass det. time= 44.7 min (810.3 - 765.6)

Volume	Invert	Avail.Storage	Storage Description
#1	28.99'	14,992 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.99	1	0	0
29.00	1,656	8	8
29.50	1,656	828	836
30.00	1,656	828	1,664
31.00	25,000	13,328	14,992

Device	Routing	Invert	Outlet Devices
#1	Primary	23.00'	**12.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.00' / 19.00' S= 0.0667 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Secondary	29.75'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 1	29.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	29.00'	**2.410 in/hr Exfiltration over Surface area above 29.00'** Excluded Surface area = 1,656 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=1.80 cfs @ 12.10 hrs HW=29.67' (Free Discharge)
└**1=Culvert** (Passes 1.80 cfs of 9.39 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 1.80 cfs @ 1.34 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.99' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF1: VFF1 Courtyard Dorm Roof

Inflow Area = 0.323 ac, 15.66% Impervious, Inflow Depth = 5.48" for 100 YR event
Inflow = 2.06 cfs @ 12.07 hrs, Volume= 0.147 af
Outflow = 0.41 cfs @ 12.51 hrs, Volume= 0.116 af, Atten= 80%, Lag= 26.1 min
Primary = 0.41 cfs @ 12.51 hrs, Volume= 0.116 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.21' @ 12.51 hrs Surf.Area= 7,408 sf Storage= 3,163 cf

Plug-Flow detention time= 197.2 min calculated for 0.116 af (79% of inflow)
Center-of-Mass det. time= 118.1 min (924.2 - 806.1)

Volume	Invert	Avail.Storage	Storage Description
#1	22.49'	22,618 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.49	1	0	0
22.50	1,080	5	5
23.00	1,395	619	624
24.00	1,728	1,562	2,186
24.50	15,000	4,182	6,368
25.00	50,000	16,250	22,618

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert X 2.00** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.65' S= 0.0713 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	23.50'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.50'	**110.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.41 cfs @ 12.51 hrs HW=24.21' (Free Discharge)
└**1=Culvert** (Passes 0.41 cfs of 25.32 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.41 cfs of 31.55 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.41 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.49' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond VFF2: VFF2

Inflow Area = 0.264 ac, 38.71% Impervious, Inflow Depth > 6.07" for 100 YR event
Inflow = 1.84 cfs @ 12.07 hrs, Volume= 0.134 af
Outflow = 1.47 cfs @ 12.16 hrs, Volume= 0.105 af, Atten= 20%, Lag= 5.4 min
Primary = 0.12 cfs @ 12.16 hrs, Volume= 0.073 af
Secondary = 1.36 cfs @ 12.16 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 24.69' @ 12.16 hrs Surf.Area= 2,083 sf Storage= 2,358 cf

Plug-Flow detention time= 192.0 min calculated for 0.105 af (79% of inflow)
Center-of-Mass det. time= 114.2 min (908.5 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	22.50'	17,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.50	504	0	0
24.00	1,152	1,242	1,242
25.00	2,500	1,826	3,068
25.10	10,000	625	3,693
26.00	20,000	13,500	17,193

Device	Routing	Invert	Outlet Devices
#1	Primary	21.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.00' / 15.00' S= 0.0400 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	24.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	22.50'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	24.60'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.12 cfs @ 12.16 hrs HW=24.68' (Free Discharge)
└**1=Culvert** (Passes 0.12 cfs of 6.75 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.12 cfs of 14.81 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.12 cfs)

Secondary OutFlow Max=1.23 cfs @ 12.16 hrs HW=24.68' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 1.23 cfs @ 0.73 fps)

Summary for Pond VFF3: VFF3 CSSC roof and site area

Inflow Area = 0.792 ac, 81.45% Impervious, Inflow Depth > 7.27" for 100 YR event
Inflow = 6.23 cfs @ 12.07 hrs, Volume= 0.480 af
Outflow = 5.15 cfs @ 12.13 hrs, Volume= 0.455 af, Atten= 17%, Lag= 3.4 min
Primary = 0.64 cfs @ 12.13 hrs, Volume= 0.289 af
Secondary = 4.50 cfs @ 12.13 hrs, Volume= 0.166 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.65' @ 12.13 hrs Surf.Area= 11,541 sf Storage= 6,542 cf

Plug-Flow detention time= 204.0 min calculated for 0.455 af (95% of inflow)
Center-of-Mass det. time= 173.7 min (941.6 - 767.9)

Volume	Invert	Avail.Storage	Storage Description
#1	39.49'	13,735 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.49	1	0	0
39.50	2,000	10	10
40.00	2,400	1,100	1,110
41.00	3,000	2,700	3,810
41.50	3,350	1,588	5,398
42.00	30,000	8,338	13,735

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 24.00' S= 0.0367 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	40.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	39.49'	**2.410 in/hr Exfiltration over Surface area**
#4	Secondary	41.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.64 cfs @ 12.13 hrs HW=41.65' (Free Discharge)
└**1=Culvert** (Passes 0.64 cfs of 8.96 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.64 cfs of 24.75 cfs potential flow)
└**3=Exfiltration** (Exfiltration Controls 0.64 cfs)

Secondary OutFlow Max=4.41 cfs @ 12.13 hrs HW=41.65' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 4.41 cfs @ 0.97 fps)

Appendix A-3 **Water Quality Calculation**

Appendix A-4 Stormwater System Maintenance Plan

STORMWATER FACILITIES
INSPECTION AND MAINTENANCE PLAN
Revised July 2020

Student Success Center and Residence Hall
University of Southern Maine, Portland, Maine

During construction activities, the maintenance of all stormwater measures will be the direct responsibility of the Contractor undertaking the work. All work shall conform to the terms and conditions and the Maine General Permit for Construction Activities (MCGP). After acceptance by the Owner, the maintenance of all stormwater management facilities, the establishment of any contract services required to implement the programs, and the keeping of records and maintenance log book will be the responsibility University of Southern Maine (USM). Notwithstanding any other schedule noted below, general inspections should be conducted by facilities staff monthly during wet weather conditions(rainfall of 0.5 inch or more) from March to November.

Piped Drainage Systems

Piped drainage systems shall be inspected on an annual basis to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and any erosion damage observed at the pipe inlet and outlet. Sediment shall be removed when its level exceeds 20% of the pipe diameter. This may be accomplished by hydraulic flushing or any mechanical means. Sediment shall be contained at the pipe outlets and not allowed to transport downstream.

Driveways, Walkways and Parking Lots

Accumulations of winter sand along paved surfaces shall be cleared at least once a year, preferably in the spring, to minimize transportation of sediment during rainfall events. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. No gravel roads or shoulders on project,

Inlet and Outlet Grates

Inlet and outlet grates have been designed for some of the pipe culvert sections and outlet structures at the site. These are intended to trap and control floatables and debris within the stormwater system. The grates should be inspected on a quarterly basis, and after large storm events (rainfall in excess of 1.0 inch) for build-up of debris and other potentially detrimental material. Periodic maintenance of these features will be required to keep grates clear and prevent damage to either the grate itself or the attached structure.

Vegetated Underdrained Filter Ponds

Inspections of the vegetatated underdrained filter ponds shall be conducted on a semi-annual basis and following significant rainfall events (rainfall in excess of 1.0 inch). Delayed or poor maintenance practices can result in loss of treatment capacity. Records should be kept of all maintenance operations to help plan future work and identify problem areas. The basin embankments should be maintained to preserve their integrity including, but not limited to,

vegetation maintenance, rodent control, erosion control and repair, and outlet control structure maintenance and repair. The embankments should be inspected annually for erosion or destabilization of side slopes, embankment settling and other signs of overtop structural failure.

The basins should be mowed at least semi-annually and clippings should be removed to minimize the amount of organic material accumulation in the basin. Sediment and debris should be removed from sediment forebays at least annually. The filter pond areas shall not be used for snow storage. Snow storage should be sited so that snow melt flows to a pretreatment BMP before reaching the filtration area. Vehicular equipment used to maintain or rehabilitate a filter pond should work from the pond perimeter and not enter the pond areas, as this will compact the soil surface and reduce filtration capacity. Under no circumstances should heavy equipment be used within soil filter areas unless removal of the filter material is proposed.

The surface of the filter ponds may clog with fine sediments over time. Maintenance of good grass cover should minimize this; however, if ponded runoff does not infiltrate within 48 hours, rototilling the top of the soil bed may be required to re-establish the soils filtration capacity. After a period of five to ten years the soil filter material may need to be replaced entirely to maintain the pollution removal function (the filter material is effectively a sorptive filter with a finite capacity). The end of the effective life of the filter material will be evidenced by significantly diminished infiltration rates and a reduction in outflow through the underdrain system. Removed soil filter material can be disposed of properly at a landfill.

BioRetention Cells

Inspections of the bioretention cells features shall be conducted on a semi-annual basis and following significant rainfall events (rainfall in excess of 1.0 inch). Delayed or poor maintenance practices can result in loss of treatment capacity. Records should be kept of all maintenance operations to help plan future work and identify problem areas. The basin embankments should be maintained to preserve their integrity including, but not limited to, vegetation maintenance, rodent control, erosion control and repair, and outlet control structure maintenance and repair. The embankments should be inspected annually for erosion or destabilization of side slopes, embankment settling and other signs of overtop structural failure.

Sediment and debris should be removed from sediment forebays at least annually. The retention cell areas shall not be used for snow storage. Snow storage should be sited so that snow melt flows to a pretreatment BMP before reaching the filtration area. Vehicular equipment used to maintain or rehabilitate a bioretention cell should work from outside the limits and not enter cell areas, as this will compact the soil surface and reduce filtration capacity. Under no circumstances should heavy equipment be used within bioretention cell areas unless removal of the filter material is proposed.

The surface of the bioretention cells may clog with fine sediments over time. Maintenance of landscaping cover should minimize this; however, if ponded runoff does not infiltrate within 48 hours, replanting of the filter bed may be required to re-establish the soils filtration capacity. After a period of five to ten years the soil filter material may need to be replaced entirely to maintain the pollution removal function (the filter material is effectively a sorptive filter with a finite capacity). The end of the effective life of the filter material will

be evidenced by significantly diminished infiltration rates and a reduction in outflow through the underdrain system. Removed soil filter material can be disposed of properly at a landfill.

Appendix A-5 **S.W. Cole Engineering, Inc. Geotechnical Report**

REPORT

19-1813 S

January 28, 2020

Preliminary Geotechnical Engineering Services

Proposed Residential Hall
& Student Success Center
University of Southern Maine
Bedford Street and Durham Street
Portland, Maine

Prepared For:
University of Southern Maine
Capital Planning & Project Management
Attention: Ann Vashon, Project Manager
25 Bedford Street
Portland, Maine 04101

Prepared By:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039
T: 207-657-2866

S.W.COLE ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing and Special Inspections*
- *GeoEnvironmental Services*
- *Test Boring Explorations*

www.swcole.com

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19-1813 S

January 28, 2020

University of Southern Maine
Capital Planning & Project Management
Attention: Ann Vashon, Project Manager
25 Bedford Street
Portland, Maine 04101

Subject: Preliminary Geotechnical Engineering Services
Proposed Residential Housing & Student Success Center
University of Southern Maine
Bedford Street & Durham Street
Portland, Maine

Dear Ann:

In accordance with our Contract, dated January 14, 2020, we have reviewed prior subsurface explorations for the subject project. This report summarizes our findings and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to review our prior subsurface information at the site in order to assess suitable foundation types and earthwork considerations associated with the proposed building construction. Our scope of services included a review of prior explorations completed at the site in July 2019, a geotechnical assessment of the subsurface findings and preparation of this report.

1.2 Site and Proposed Construction

The site of the proposed construction is located on the University of Southern Maine (USM) Portland Campus and is situated on the easterly side of the intersection of Durham and Bedford Streets in Portland, Maine. The site is currently occupied by two buildings,

as well as paved and landscaped areas. We understand the existing Woodbury Campus Center and the adjacent facilities office building structures will be razed in favor of the proposed construction.

Based on conceptual information provided at this time, we understand redevelopment plans call for construction of a student housing structure and a student center building. The student housing structure will consist of two connected L-shaped structures; one 8-story and one 5-story, with on-grade floor slabs on the ground floor level. The Student Success Center is proposed on the westerly side of the Student Housing buildings in an area currently occupied by paved parking and landscaped areas. The proposed Student Center structure will be 4-stories.

Proposed and existing site features are shown on the "Exploration Location Plan" attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Eight test borings (B-19-1 through B-19-8) were made at the site on July 30 and 31, 2020 by S. W. Cole Explorations, LLC. The exploration locations were selected by USM and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using measurements from existing site features. The approximate exploration locations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C.

2.2 Testing

The prior test borings were drilled using hollow stem auger techniques. The soils were sampled at 2 to 5 foot intervals using a split spoon sampler and Standard Penetration Testing (SPT) methods. Pocket Penetrometer Tests (PPT) were performed where stiffer cohesive soils were encountered. SPT blow counts and PPT results are shown on the logs.

Soil samples obtained from the explorations were returned to our laboratory for further visual classification. Laboratory testing was not requested by the client.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

Beneath a surficial layer of pavement or topsoil, test borings B-19-1, B-19-2, B-19-3, B-19-6, B-19-7 and B-19-8, made in the proposed Residence Hall and Student Success Center development area, encountered a soil profile generally consisting of uncontrolled fill overlying native deposits of glaciomarine sand, silt and clay, overlying a thin veneer of outwash sand, mantling refusal surfaces (probable bedrock) at depths varying from about 11 to 26 feet below the ground surface. The uncontrolled fills generally varied from 1 to 3 feet thick, except at B-19-6 where the uncontrolled fills extend down to probable bedrock at a depth of about 13 feet, and B-19-7 where the uncontrolled fill extend down to what appears to be native sand and silt at a depth of about 9 feet.

Test borings B-19-4 and B-19-5 were made northwest of the proposed development area and encountered a surficial layer of topsoil overlying native deposits of silty sand, overlying shallow refusal surfaces (probable bedrock) at depths of about 5 feet below the ground surface.

Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

3.2 Groundwater

The soils encountered at the test borings were moist to wet from the ground surface. Groundwater was encountered at depths varying from about 8 to 16 feet in the borings within the proposed development area. Groundwater likely becomes perched on the relatively impervious silty clay and bedrock surfaces encountered at the test borings. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 Foundation and Floor Slab Considerations

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle foundation and floor slab considerations include:

Residential Hall: The subsurface conditions beneath the proposed Residential Hall are generally unsuitable for direct support of spread footing foundations; consequently, we recommend pile-supported foundations or, rigid inclusions be considered to improve the ground for support of spread footing foundations.

On-grade floor slabs bearing on a layer of compacted Structural Fill overlying properly prepared soil subgrades appear feasible for the Residential Hall.

Based on the available subsurface information, we preliminarily interpret the soil profile beneath the Residence Hall at correspond to Seismic Soil Site Class E (IBC 2015).

Student Success Center: Although none of the prior test borings are located directly beneath the Student Success Center, the nearby test borings suggest the trend of soil and bedrock conditions generally improves from east to west. We anticipate the Student Success Center is likely underlain by uncontrolled fills overlying stable native sands, overlying relatively shallow bedrock. At this time, based on the nearby exploration information, we recommend planning consider aggregate pier ground improvement or, over-excavation and replacement of unsuitable soils with compacted Structural Fill for support of spread footing foundations.

On-grade floor slabs bearing on a layer of compacted Structural Fill overlying properly prepared soil subgrades appear feasible for the Student Success Center.

Based on the available subsurface information, we anticipate the soil profile beneath the Student Success Center would correspond to Seismic Soil Site Class D (IBC 2015).

4.2 Excavation and Dewatering Considerations

Excavation work will generally encounter uncontrolled fills, silty sand, silt, clay soils, groundwater, and bedrock with depth. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur ideally during drier, non-freezing weather of Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the native silt and clays, when wet. Low ground pressure tracked equipment may be needed and temporary haul roads overlying geotextile fabric may be necessary. Final cuts to soil subgrades should be performed with a smooth-edged bucket to help reduce strength loss from soil disturbance.

Based on the trend of subsurface findings, we anticipate bedrock removal may be required in the western portion of the development area. As blasting is restricted in the City of Portland, bedrock removal by hoe-ramming should be anticipated. We recommend pre-construction surveys be completed on surrounding structures, water supply wells and infrastructure prior to commencing excavation activities.

Vibrations from construction should be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site. More restrictive vibration limits may be warranted in specific cases with sensitive equipment, historic structures or artifacts on-site or within close proximity.

Sumping and pumping dewatering techniques should be adequate to control groundwater in foundation and most utility excavations. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

The on-site granular fills and native sands may be suitable for reuse as compacted Granular Borrow in paved and landscape areas. The drier native silts and clays are unsuitable for reuse in building and paved areas, but may be reused in landscape areas. The saturated silts and clays are unsuitable for reuse and should be properly disposed off-site.

4.3 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.4 Recommendations for Additional Study

We recommend additional test boring explorations and in-situ geophysical testing be performed at the site to further explore the subsurface conditions and Seismic Site Class.

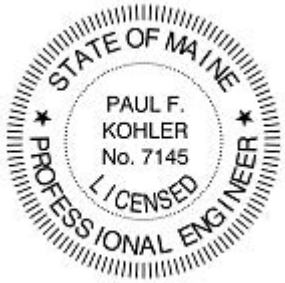
5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the design phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.

Paul F. Kohler, P.E.
Senior Geotechnical Engineer



TJB:pfk/emw

APPENDIX A

Limitations

This report has been prepared for the exclusive use of the University of Southern Maine (USM) for specific application to the proposed Residence Hall and Student Success Center on the USM Campus in Portland, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

APPENDIX B

Figures

DURHAM STREET

BEDFORD STREET

PROPOSED RESIDENCE HALL

PROPOSED STUDENT SUCCESS CENTER

B-19-1

B-19-2

B-19-3

B-19-4

B-19-5

B-19-6

B-19-7

B-19-8

8" PIPE L=199.2' S=0.015

8" PIPE L=232.2' S=0.010

8" PIPE L=227.5' S=0.006

8" PIPE L=257.5' S=0.010

SD 22.1

SD 22.2

SD 22

SD 21.5

SD 21.4

SD 21.1

SD 21.2

SD 20.1

SD 20.3

SD 20.4

SD 20

SD 12

SD 13

SD 14

FFE 25.00

FFE 25.50

FFE 25.50

FFE 25.50

FFE 37.00

+ 25.00

+ 35.00

+ 35.00

+ 35.00

+ 35.00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

LEGEND:

APPROXIMATE BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=60' SCALE PLAN OF THE SITE PROVIDED BY UNIVERSITY OF SOUTHERN MAINE, (USM) AND OVERLAID WITH A 1"=30' SCALE PLAN ENTITLED "BORING PLAN," PREPARED BY SMRT AND PROVIDED AS A PORTABLE DOCUMENT FORMAT (PDF) FILE.
2. THE BORING LOCATIONS WERE SELECTED AND ESTABLISHED IN THE FIELD BY USM AND LOCATED ON THIS PLAN BY MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND IS NOT TO BE USED FOR CONSTRUCTION.

0 30 60 Feet

S.W.COLE ENGINEERING,INC.

UNIVERSITY OF SOUTHERN MAINE

EXPLORATION LOCATION PLAN

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED STUDENT HOUSING AND SUCCESS CENTER
BEDFORD STREET
PORTLAND, MAINE

Job No.:	19-1813	Scale:	1" = 30'
Date :	01/28/2020	Sheet:	1

R:\2019\19-1813\CAD\Drawings\19-1813-EEP.dwg 1/28/2020 12:05 PM 11, CDeL.S. W. Cole Engineering Inc.

APPENDIX C

Exploration Logs and Key

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-1
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/30/2019
DATE FINISH: 7/30/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 25' Estimated | **TOTAL DEPTH (FT):** 25.5 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 16 ft 7/30/2019 Soils Saturated at 16 +/- ft
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0.4-2.4	24/18	4-7-6-6			0.3 Asphalt Pavement Medium dense dark brown fine to medium SAND with some silt and gravel (Fill)	
										2.0 Very stiff becoming stiff brown Silty CLAY with some brown sand layers	
20	5		2D		5-7 6-	24/24	3-5-9-10	q_P=7 to 8 ksf			
										9.0 Loose or soft brown Silty CLAY with silty sand layers	
15	10		3D		10-12 11-	24/20	WOH-2-3-5	q_P=5 to 7 ksf		11.0 Very stiff to stiff brown Silty CLAY with some brown silty sand layers	
					14-			q_P=2 ksf		14.0 Medium brown silty CLAY with brown silty sand layers	▽
10	15		4D		15-17	24/24	1-2-4-1				
					17-			q_P=0.3 ksf		16.5 Soft gray Silty CLAY	
										19.0 Medium gray sandy silty CLAY with gray sand layers	
5	20		5D		20-22 20.5-	24/24	3-3-7-10	q_P=1 ksf		21.0 Medium dense brown fine SAND with some silt, some clayey silt layers Some gravel	
0	25		6D		25-25.3	4/4	60/4"			25.0 Dense brown Silty SAND and GRAVEL	

Auger Refusal at 25.5 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-1

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-2
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/30/2019
DATE FINISH: 7/30/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 26.5' Estimated | **TOTAL DEPTH (FT):** 17.0 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Brett Raiche | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 14 ft 7/30/2019 Saturated soils at 14 ft +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
25			1D		0.3-2.3	24/18	6-2-2-4			0.3 Asphalt Pavement 0.5 Medium dense brown Silty CLAY and SAND (Mixed Fill) 1.2 Medium dense brown SAND, some silt, some gravel (Fill) Very stiff brown Silty CLAY, occasional sand layers	
	5		2D		5-7 5.5-	24/20	2-3-4-5	q_P=6 to 7 ksf			
20										9.0 Soft or loose brown Silty Sandy CLAY	
	10		3D		10-12 11-	24/24	WOH- 2-2-4	q_P=1 to 1.5 ksf		10.5 Medium varved brown Silty CLAY with frequent sand layers	▽
15											
	15		4D		15-16.3	16/8	6-10- 50/4"			14.5 Medium dense brown Silty SAND, some fine gravel, pieces of broken rock in tip of spoon	
10											

Auger Refusal at 17.0 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-2

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-3
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/30/2019
DATE FINISH: 7/30/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 31.5' Estimated | **TOTAL DEPTH (FT):** 11.5 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 8 ft 7/30/2019 Sand seams wet at 8 +/- ft
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth
30			1D		0.3-2.3	24/14	6-8-4-4			0.3 Asphalt Pavement 1.0 Medium dense brown Gravelly SAND, trace silt (Fill)	
					2-			q_P=8 ksf		Very stiff brown Silty CLAY, some thin brown sand layers	
	5		2D		5-7	24/20	5-3-4-5				
25					6-			q_P=4 to 7 ksf			▽
										8.0 Medium dense brown SAND, some silt	
	10		3D		10-11.5	18/14	3-2-60				
20										11.0 Probable weathered BEDROCK Auger Refusal at 11.5 feet Probable Bedrock	

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-3

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

S.W.COLE EXPLORATIONS, LLC

BORING LOG

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-4
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 42' Estimated | **TOTAL DEPTH (FT):** 5.3 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): 7/31/2019 No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0-2	24/12	1-3-5-9			Topsoil with organics	
										0.7 Medium dense light brown Silty SAND, trace fine gravel	
40											
										3.0 Medium dense brown Silty SAND, some gravel, pieces of broken rock in tip of spoon	
	5		2D		5-5.3	3/3	50/3"			5.0 Probable weathered BEDROCK	

Auger Refusal at 5.3 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-4

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-5
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 42' Estimated | **TOTAL DEPTH (FT):** 5.0 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): 7/31/2019 No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0-2	24/14	1-1-4-12			0.3 Topsoil with organics 0.8 Medium dense light brown Silty SAND, trace fine gravel	
40			2D		2-4	24/16	12-18-18-30			Medium dense to dense brown Silty SAND, some gravel, pieces of broken rock in tip of spoon	
	5									4.0 Probable weathered BEDROCK	

Auger Refusal at 5.0 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-5

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-6
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 41.5' Estimated | **TOTAL DEPTH (FT):** 13.3 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 11 ft 7/31/2019 Soils appear saturated at 11 ft +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
40			1D		0-2	24/14	4-16-11-10			0.3 Topsoil with organics Medium dense brown Silty SAND, some gravel (Probable Fill or disturbed soil)	
			2D		2-4	24/16	8-11-13-10				
	5		3D		5-7	24/20	6-9-9-9				
35											
	10		4D		10-12	24/6	5-5-5-3			Possible loose blast spoils FILL	▽
30										13.0 Probable weathered BEDROCK Auger Refusal at 13.3 feet Probable Bedrock	

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-6

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-7
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 33.5' Estimated | **TOTAL DEPTH (FT):** 12.3 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): 7/31/2019 No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0.5-2.5	24/15	20-16-12-9			0.5 Asphalt Pavement 0.8 Dense brown SAND and GRAVEL, trace silt (Pavement Base Fill) 1.5 Medium dense brown Gravelly SAND, trace silt (Pavement Subbase Fill)	
30										Medium dense to dense brown silty SAND, some gravel (Probable Fill)	
	5		2D		5-7	24/20	9-11-12-16				
25										9.0 Dense brown SAND and SILT with pieces of weathered rock	
	10		3D		10-11.7	20/16	11-28-38-50/2"			10.5 Very dense, highly weathered ROCK (Sapprolite) 11.7 Probable weathered BEDROCK	

Auger Refusal at 12.3 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-7

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-8
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan
ELEVATION (FT): 29' Estimated
TOTAL DEPTH (FT): 13.9
LOGGED BY: Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC
DRILLER: Corey Culligan
DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50
AUGER ID/OD: 2 1/4 in / 5 5/8 in
SAMPLER: Standard Split-Spoon
HAMMER TYPE: Automatic
HAMMER WEIGHT (lbs): 140
CASING ID/OD: N/A /N/A
CORE BARREL:
HAMMER EFFICIENCY FACTOR: 0.91
HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft 7/31/2019 Soils appeared saturated at 10 ft +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0.3-2.3	24/12	7-7-4-5			0.3 Asphalt Pavement 0.8 Medium dense brown Gravelly SAND, trace silt (Pavement Base Fill)	
										Loose brown silty SAND with brown silty CLAY (Mixed Fill)	
										3.0 Very stiff brown silty CLAY	
25	5		2D		5-7 6-	24/20	3-3-4-6	q_P=5 to 6 ksf			
20	10		3D		10-12 11-	24/20	4-6-8-7	q_P=1 to 2 ksf		9.0 Medium Dense, varved brown Silty SAND with brown silty clay layers	▽
										12.5 Probable cobbles or weathered BEDROCK	

Auger Refusal at 13.9 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-8

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

KEY TO NOTES & SYMBOLS
Test Boring and Test Pit Explorations

Stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

Appendix A-6 **FEMA Firm Map**

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 28	56.00	Disk set vertically in north face near the northwest corner of 3-story building housing the Casco Bank on Forest Avenue, 1.2 miles northwest along Forest Avenue from the Post Office near the intersection of Forest Avenue and Woodford Street.
RM 29	35.25	Copper bolt set in top of granite post flush with surface, located approximately 0.85 mile northwest along Forest Avenue from Post Office near intersection of Forest Avenue and Noyes Street, 9.0 feet northwest of northwest curb of Noyes Street and 8.5 feet southwest of southwest curb of Forest Avenue.
RM 30	25.36	Disk set in top of concrete foundation of Oakhurst Dairy building at No. 364 Forest Avenue, 35 feet southwest of north corner of building and level with street, approximately 0.55 mile northwest of Post Office near intersection of Hudson Street.
RM 31	11.88	MDOT plaque set in centerline of service doorway of Franklin Street Pumping Station at intersection of Franklin Street and Marginal Way.
RM 32	9.89	Brass disk set in top of reinforced concrete post 10 inches below present ground level, 250 feet south of C. Profenno Company, 127 Marginal Way, and 350 feet north of intersection of Preble Street and Marginal Way, 27.5 feet southeast of centerline of Marginal Way.
RM 33	36.80	Disk set vertically in northeast face of concrete foundation of 2-story brick building, 56 feet northwest of Seawall Street and 1 foot northwest of east corner of building, near Seawall Street Railroad Station and 360 feet north of crossing of Portland Terminal Railroad and Seawall Street.
RM 34	22.81	Disk set in sidewalk on west side of Saint John Street and opposite intersection of A Street at corner of entrance to Arlan's Shopping Center parking lot, in center of sidewalk and 4.28 feet west of western edge of Saint John Street and approximately 177.4 feet from Arlan's Store.
RM 35	12.83	Chiseled X cut in bolt on rim of fire hydrant on northwest side of Commercial Street, 550 feet northeast of High Street, 76 feet south of Pole No. 29.1, across from No. 322 Commercial Street.
RM 36	28.34	Disk set flush in top of concrete endwall railing at northwest end of Interstate 295 bridge over the Fore River, 21.7 feet south of Portland-South Portland city line sign, and 24.7 feet west of the centerline of Interstate 295 southbound, and 3.5 feet above pavement grade at curb line.
RM 37	22.23	Disk set vertically in center of south face of large rock set in second layer of masonry retaining wall on north of railroad tracks, 45.5 feet east of west end of wall, located .75 mile east from the overpass of U.S. Route 1 over tracks and 142 feet east of east edge of Emery Street foot bridge over tracks.
RM 38	15.56	Disk set vertically in southeast side of first concrete pier southeast of Commercial Street, 25.0 feet southeast of centerline of Commercial Street, 39 feet southwest of northeast end of pier, 0.85 mile west from Custom House at State Route 77 bridge over Fore River.

[1] National Geodetic Vertical Datum of 1929

Project Location

ZONE A2 (EL 10)
ZONE A4 (EL 11)
ZONE A1
ZONE A5
ZONE B
ZONE C
ZONE V3 (EL 12)
BACK COVE
FORE RIVER
THOMPSON POINT
CORPORATE LIMITS
RM 28
RM 29
RM 30
RM 31
RM 32
RM 33
RM 34
RM 35
RM 36
RM 37
RM 38

KEY TO MAP

- 500-Year Flood Boundary
- 100-Year Flood Boundary
- Zone Designations*
- 100-Year Flood Boundary
- 500-Year Flood Boundary
- Base Flood Elevation Line With Elevation In Feet**
- Base Flood Elevation in Feet Where Uniform Within Zone** (EL 987)
- Elevation Reference Mark RM7×
- Zone D Boundary
- River Mile •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depth less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance and flood plain management purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas. The coastal flooding elevations shown may differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

For adjoining map panels, see separately printed Index To Map Panels.

Coastal base flood elevations shown on this map include the effects of wave action.

Coastal base flood elevations apply only landward of 0.0 NGVD.

INITIAL IDENTIFICATION:
APRIL 29, 1977
FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 17, 1986
FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

COASTAL BASE FLOOD ELEVATIONS APPLY ONLY LANDWARD OF 0.0 NGVD

ADJOINING AREA SHOWN AS INSET A ON PANEL 230051 0016 B

Memo

SMRT Architects and Engineers
877.700.7678
smrtinc.com

To	Portland Planning Department	**Date**	August 20, 2020
From	Kenneth D. Costello	**Project No.**	19206
Subject	Site Landscape Narrative	**Project Name**	USM SSC and Portland Commons Residence Hall

Site and landscape design

The landscape/site design for the new USMC SSC and Portland Commons Residence Hall is intended to enhance the USM Portland campus while maintaining and bettering pedestrian connections within the eastern portion of the campus.

The design intent for the CSSC quad and Portland Commons courtyard is to allow these spaces to be utilized dynamically for any needs the university has, including passive and active recreation, special events and community/university gatherings.
The CSSC quad will be the heart of the campus in regard to student activity and an entrance feature as visitors arrive at the Campus. As such, the University intends to utilize the quad and adjacent front porch of the CSSC for student gatherings, special events/performances and community uses. In addition, the open quad will allow for active uses such as frisbee and ball throwing along with more passive student uses such as studying, eating and small group gathering. The quad is intended to be irrigated to maintain the lawn in good condition for visual and use purposes.

Landscaping around the quad is intended to meet many uses. Trees along Bedford mimic the ornamental trees on the south side of Bedford Street to emphasize a cohesive campus but spacing is modified directly in front of the quad to allow for better views to the quad and CSSC. Trees on either side of the quad provide shade for students who are lingering at the quad and also provide visual focus from Bedford St. to the CSSC. Landscaping and stormwater management along the east side of the quad also separate the active uses of the quad from the residential units to provide buffers and privacy.

Where the CSSC quad is the heart of the campus, the Portland Commons Residence Hall courtyard is the backyard for the building tenants. The courtyard also will function as a gathering and event space with a large patio and adjacent lawn area for building events, general recreation, and social gatherings. Landscaping in the courtyard is intended to bring the space down to human scale, provide shade for small gatherings and buffer active spaces from the residential units. The perimeter of the courtyard is planted to provide an appropriate buffer from residential uses and provide the most flexibility with larger open spaces in the middle. Planting within the courtyard has been selected to withstand the more sheltered, shady environment while minimizing maintenance.

Memo

SMRT Architects and Engineers
877.700.7678
smrtinc.com

To	City of Portland	**Date**	08/28/2020
From	Kristen Damuth	**Project No.**	19206
Subject	Glazing Calculation	**Project Name**	Portland Commons

Glazing Criteria

Window to wall requirements

Per Standard D-6 of the USM Design guidelines, Appendix 3 of the City of Portland Design Guidelines.

- First Floor along Public Streets 50% of the wall area between 2 and 9 feet.
- Upper floors 15% to 40%
  - If it can be demonstrated that the building program precludes transparent windows along first floor street frontages, the other surface details shall be used (see Standard D-4)

The proposed Portland Commons building has been developed to place the most active and transparent functions along Bedford Street. This is including the primary entrance to the building, Student Kitchen Space, Student Living Room, Meeting Rooms, Bicycle Storage and Work room, and Administration space.

The location of these programs allow us to meet the 50% transparency requirements along the ground floor of Bedford Street as shown in the attached Drawings. This includes two set back portions of the building that are comprised primarily of opaque façade. The Eastern set back portion of this façade is a residential bedroom and programmatically does not want an increased transparency. The Western Opaque assembly helps define the massing of the buildings as it returns northward up the quad. If these two areas were to be omitted and only what is directly situated on Bedford Street is calculated, we achieve a higher percentage of transparency; 60%.

The upper Floors along Bedford Street achieve a 21% window to wall ratio and is within the 15%-40% requirement.

The Durham Street Ground floor is comprised of entirely residential units and is setback from the sidewalk to create privacy for these units. The window to wall ratio does not meet the 50% requirement as shown. The combination of the residential program and Passive House requirements within these units precludes any increase in glazing. The overall design approach as previously discussed has adopted the Standards set forth in Standard D-4 and has broken the massing down into components scaled to the context of the adjacent buildings and has established a clearly defined base to the building.

The upper Floors along Durham Street achieve a 28% window to wall ratio and is within the 15%-40% requirement.

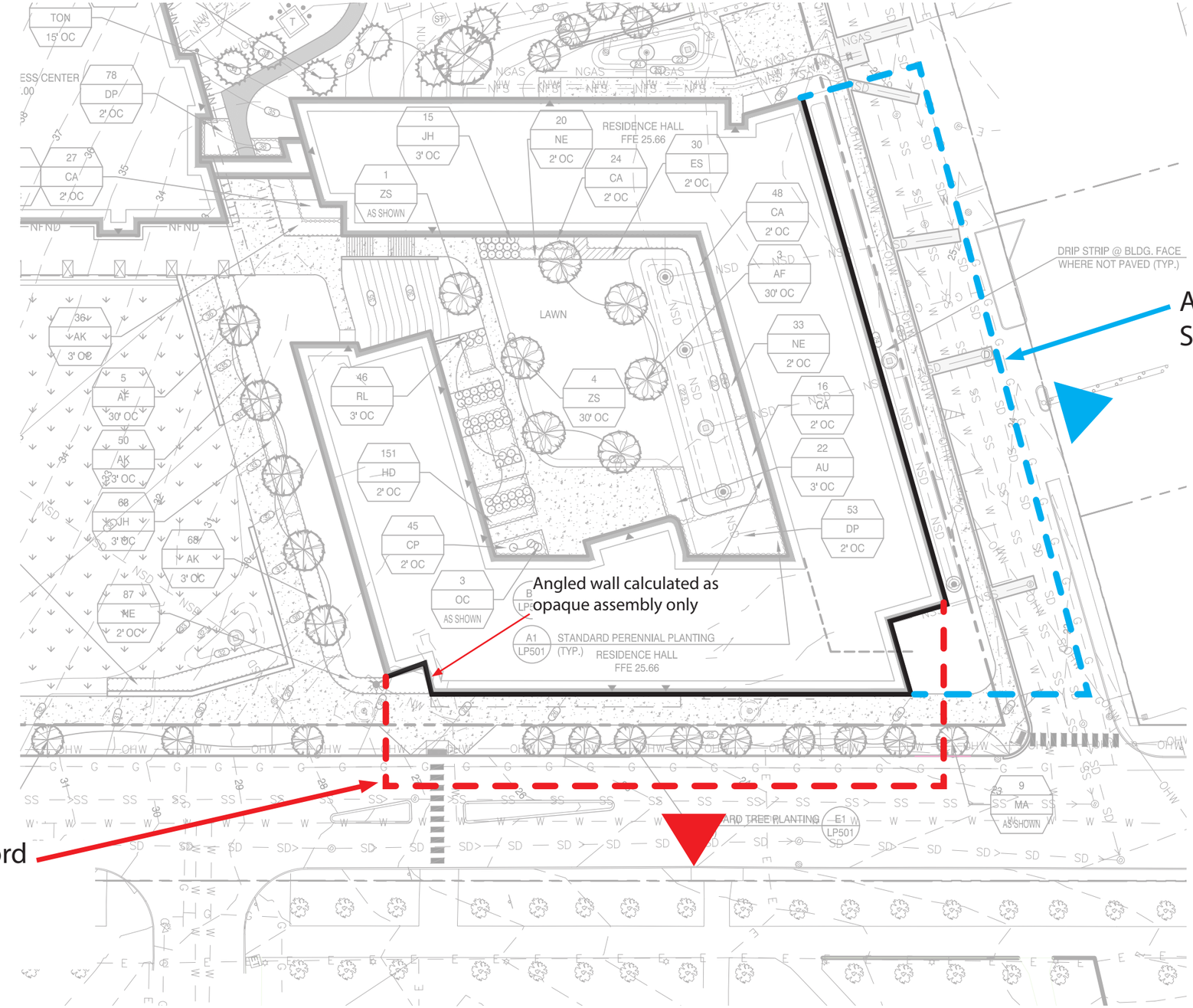
UNIVERSITY OF
SOUTHERN MAINE

Residence Hall & Career & Student Success Center

GLAZING CALCULATIONS

AUGUST 27, 2020

Percentage of Glazing: Street Facades



Percentage of Glazing: Bedford Street



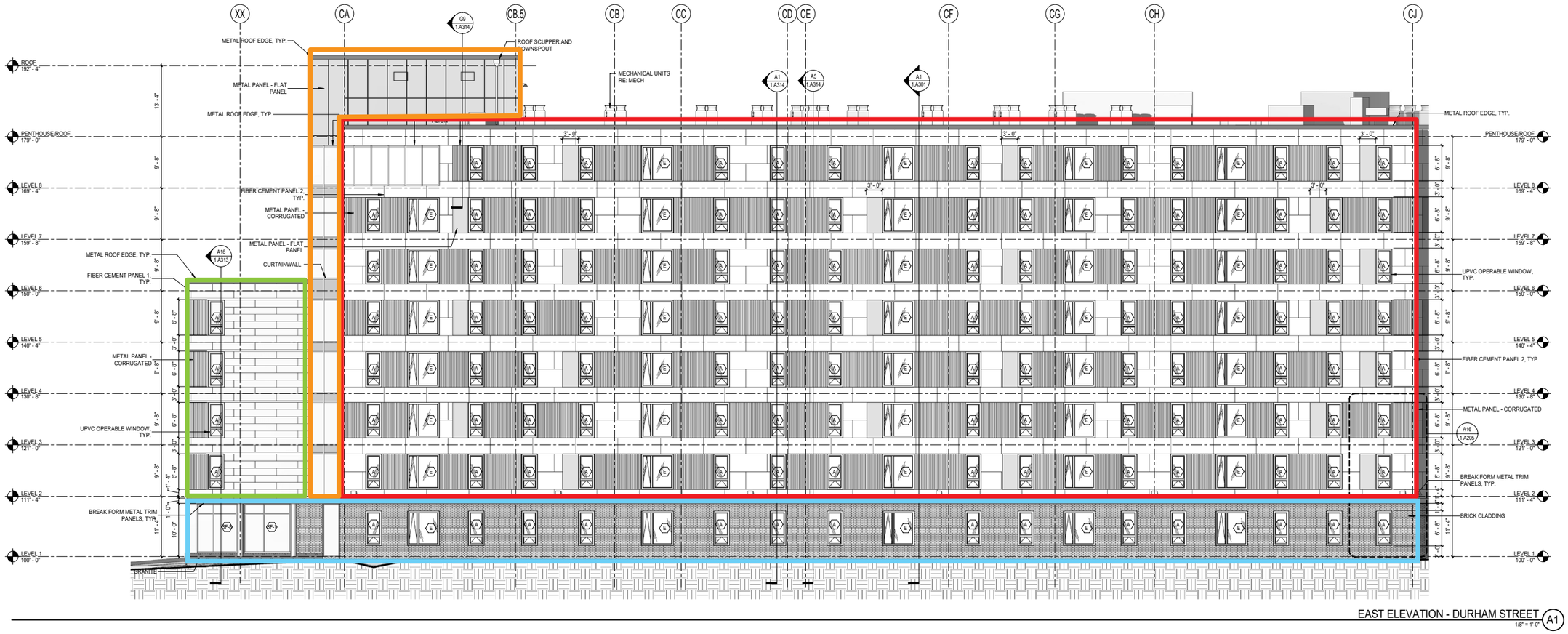
Note: Total Area taken from orthogonal view as outlined. Glazed openings that are not orthogonal to view have not been included in these calculations.

SOUTH ELEVATION - BEDFORD STREET J6
1/8" = 1'-0"

SOUTH ELEVATION - PARTIAL J1
1/8" = 1'-0"

		Total Area	Subtotal	Glazed Area	Subtotal	Calculation	
Upper Floors		8,310 sf	11,210 sf	1,840 sf	2,385sf	2,385/11,210=.212	Upper Floors: 21% Glazing Standard D-6 requires 15%-40% Glazing atUpper floors, This conforms as required.
		1,334 sf		425 sf			
		1,566 sf		120 sf			
Ground Floor		2,524sf	2,524sf	1,273 sf		1,273/2,524=.504	Ground Floor: 50% Glazing Standard D-6 requires 50% Glazing at Ground Floors. This conforms as required.

Percentage of Glazing: Durham Street



		Total Area	Subtotal	Glazed Area	Subtotal	Calculation	
Upper Floors		14,141 sf	16,019 sf	3,968 sf	4,444 sf	4,444/16019=.277	Upper Floors: 28% Glazing Standard D-6 requires 15%-40% Glazing at Upper floors, This conforms as required.
		930 sf		396 sf			
		948 sf		80 sf			
Ground Floor		2,700 sf	2,700 sf	668 sf	668 sf	668/2,700=.247	Ground Floor: 25% Glazing

Standard D-6 requires 50% Glazing at Ground Floors. This Area does not comply, however the residential program precludes an increase percentage of glazing.

COMMITMENT & INTEGRITY
DRIVE RESULTS

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July 27, 2020

Matthew Grooms, Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: University of Southern Maine
Career & Student Success Center and Residence Hall (Portland Commons)
Response to Staff Comments

Dear Matthew:

Thank you for coordinating the review of the proposed Career & Student Success Center (CSSC) and Residence Hall (Portland Commons) at 25 Bedford Street. We want to especially thank City staff for meeting with us over the last several months and providing the opportunity for an open dialogue as the designs have evolved.

The following letter compiles responses to comments received from the City, including the following:

- Email correspondence from Caitlin Cameron, Urban Designer, dated April 10, 2020;
- Email correspondence from Jeff Tarling, Urban Forester, dated April 10, 2020;
- Email correspondence from Mike Tremblay, Senior Engineer, dated April 10, 2020;
- Email correspondence from Tom Errico, Traffic Engineer (TY Lin), dated April 10, 2020;
- Email correspondence from Ben Pearson, Compliance Coordinator, dated April 10, 2020;
- Email correspondence from Michael Guethle, Stormwater Review Engineer (Wright-Pierce), dated April 23, 2020.

By-and-large, these comments have been addressed and reviewed with City staff in our meetings over the last several months. We have compiled them, here, to formalize our responses for the record.

In addition, we have made other updates to the drawings and offer supplemental Application materials; those updates and materials are described herein and attached for your use.

Comments from City

The comments received to-date are provided below for your reference and our response follows each comment in italics:

Email from Caitlin Cameron, Urban Designer, dated April 10, 2020

- Purpose: The USM overlay zone is especially concerned with new construction that creates visual connection with existing campus buildings and has the goal of a cohesive campus appearance. This has not been addressed so far in the submission. Staff do not find the proposed student center form, articulation, or materiality contribute to campus cohesion.

  The campus is defined by buildings with generally consistent material treatments of typically two materials (brick, warm-tone concrete or masonry/veneer, or grey metal/curtain wall) applied to the building. Curtain wall and large windows are found in many buildings. The buildings are generally contemporary with expressive roof forms, curtain wall/high transparency, typical institutional characteristics. More explanation is needed on what visual connections with existing buildings are being created and how these buildings are contributing to a cohesive campus appearance.

- *See attached Design Narrative dated June 29, 2020 and updated renderings dated July 23,2020.*

- A: Campus Design: More explanation is needed on how these buildings are integrated into the coherent whole of the campus.

  Campus Edges, Building Orientation are well designed to place the most active portions of the buildings towards the main streets and paths of the campus. The proposal is removed from and should not be expected to relate to the residential neighborhood.

  Pedestrian Environment: Please clarify the intended uses and circulation through the new quad and the edge treatments.

  Gateways, View and Landmarks: This location is not considered a gateway. However, the view of the residence hall on Bedford from Forest Avenue approach is visible corner and should be considered for the overall corner treatment and appearance. The current rendering of this corner shows some emphasis provided by the stair tower/shading devices.

  However, there are many materials and treatments happening within one building and this view of the building. The corner view doesn't visually connect to the existing buildings.

  - *See attached Design Narrative dated June 29, 2020 and updated renderings dated July 23,2020.*

- B: Access and Circulation: The project maintains the connectivity and circulation patterns already established on the ground and in the master plan. If the architecture of the student center building is going to be less visually cohesive with the existing campus buildings, then urban design and landscape components become even more important in creating the campus cohesion.

  Sidewalks: The standard requires brick sidewalks at least 8 feet in width. This is especially critical on Bedford Street where there is existing sidewalk design across the street that includes wide brick sidewalks, lighting, and landscape esplanades. This side of the street should have a cohesive design as the main street of the campus.

  Lighting: Please confirm that the proposed lighting conforms to what is already installed around campus or on the existing streets.

  - *Sidewalks: The USM Design Guidelines indicate 8' wide brick sidewalks, those guidelines were completed in May of 2006, and Wishcamper was built shortly after that. Subsequently, the City Sidewalk Material policy from the Technical Manual was adopted in October 2016 and shows the USM campus with concrete sidewalks. USM preference is not to use brick, and we believe we are in compliance with the Sidewalk Materials policy.*

    Lighting: The project goal is to be consistent with existing lighting on campus if available and meet energy and dark skies compliance, as well as, provide a safe and secure pathways to campus buildings and public ways. However, there is not a consistent campus standard. The fixtures proposed have a similar style and a similar height to what is existing around the Wishcamper portion of the campus. The maintenance parking lot has a few taller pole lights but do match the proposed fixtures and mounting height of the new lighting that will be installed as part of the new Wishcamper parking lot project.

- C: Parking, Loading, Service Areas: Project appropriately places the loading, service areas, utilities away from the active street frontage. No new parking is associated with this proposal. Active uses are appropriately oriented towards Bedford Street.

  - *Acknowledged.*

- D: Architectural Design:

  Height, setbacks, stepbacks, and massing are considered appropriate in scale and placement for this location on campus.

  Entrances: The entrances appropriately face Bedford Street, however, the residence hall entrance is not proportionately scaled and emphasized compared to the overall scale of the building.

  Materials: The residence hall uses far more materials within one building than is characteristic of the existing buildings. Many of the materials selected for this building could be considered to relate to the campus materials, however, the existing buildings generally apply only one or two materials. The use of brick may be more appropriate for the rear massing of the building adjacent to existing structures that use brick and warm-tone concrete materials. The grey tones better relate to the buildings found on Bedford Street. Use of natural wood finishes is not contextual to Portland or the USM campus. Treatment of rooftop mechanicals should conform to the standard regarding screening and integration with the overall design form.

    - *See attached Design Narrative dated June 29, 2020 and updated renderings dated July 23,2020.*

Email from Jeff Tarling, Urban Forester, dated April 10, 2020

- The main landscape features of the project are the Quad open space turf area, which will become perhaps the main focal point of the University once the project has been completed. It is a really large space without the number of trees one might see on the typical college campus... this is likely due to the multi use purpose of having a large open area. The proposed tree alley on the right side consists of only 4 shade trees with 3 on the West, opposing side. Recommendations or suggestions might include increasing the tree numbers to 5 on each side, one suggestion on the tree type use would be to consider a New England native tree that has Fall color as it can help create a sense of place vs using the European Linden. While they can grow stately, here in Portland we receive more complaints from the public about 'Sooty Mold' issues with Linden than almost all others. Suggestions might include Sugar Maple, European Beech (noticing the nearby campus has some great heritage Beech examples), Red Maple, Honeylocust, perhaps American Elm. This would be a University choice vs a condition.

  - *We welcome suggestion of alternative species to the Lindens such as European Beech, Red or Sugar Maple, or new (with proven resistance to Dutch Elm Disease) American Elm varieties and will review with USM.*

- Street-trees - the project plans a densely spaced planting of 'Adirondack' Crabapple which should do well along Bedford Street. The density is closer than our 'City' standard, it is likely USM will be caring for these trees if so the density is acceptable, if the trees are to be maintained by the city we would look at reducing them by 50%. Overall, the proposed USM project will increase the green space percentage by removing the parking lot and creating the Quad area. It would be hopeful that the tree numbers in the Quad could be increased to at least 5 shade trees on each side of the Quad and selecting a tree other than the European Linden only since we have seen many issues.

  - *The proposed flowering crabapples along Bedford Street directly mirror those on the opposite side and will be maintained in similar fashion by the USM. See above for Quad tree species.*

Email from Mike Tremblay, Senior Engineer, dated April 10, 2020

- DPW suggests that parking be provided along the new residents hall on Bedford Street. This can likely be provided in the currently proposed 12-foot esplanade. The remaining space should be wide enough for a viable esplanade, or could be reallocated to wider sidewalks along this segment of Bedford Street.

- *Parallel parking spaces are commonly 9' wide and 20' long, so the esplanade area would be adequate for about 8 parking spaces (160' along dorm frontage). The suggestion to use the esplanade for parking is not consistent with review comments by Urban Design reviewer to match the easterly side of Bedford, which has an esplanade with street trees.*

- The sidewalk on Durham Street should be widened to the edge of the City ROW. It is likely that Durham Street will see significantly more pedestrian traffic once the residence hall is occupied.
  - *The Durham sidewalk is presently shown at 6' wide which is adequate for two-way pedestrian traffic. This end of the campus has limited destinations for students.*
- A maintenance agreement will be required as the Bedford Street sidewalk is located within USM's property.
  - *Acknowledged.*
- The ADA ramp at the corner of Durham Street and Bedford Street should be reconsidered. Its alignment suggests there may be a crosswalk across Bedford Street where none is provided.
  - *The ADA ramp has been modified to reflect that there is not a crosswalk across Bedford Street and will align to allow for access across Durham St.*
- Proposed spot grades should be provided for all new sidewalks, ramps, and driveways.
  - *Additional spot grade information will be included in the construction documents.*
- A move-in/move-out traffic management plan should be provided. This plan should include, but not necessarily be limited to, the day(s) of the week that such activity will take place; where loading and unloading will take place; how vehicles will be routed to and from the loading zone(s); what, if any, changes to roadway regulations may be necessary (e.g. converting a roadway to one-way to allow for street parking where none would otherwise exists); etc.
  - *Please see the attached "Preliminary Plan for Summer/Fall Move-In" prepared by USM.*

Email from Tom Errico, Traffic Engineer (TY Lin) , dated April 10, 2020

- According to the Traffic Impact Analysis prepared by VHB dated March 5, 2020 the project would generate new peak hour traffic levels that would require a Traffic Movement Permit (TMP). The trip generation estimate was based upon the residence hall and student center facilities and increases in student enrollment in 2027. The applicant shall submit a Traffic Movement Permit application so that a scoping meeting can be scheduled.
  - *An application for a Traffic Movement Permit was submitted on 07/22/2020, and we anticipate the scoping meeting to be scheduled within the next few weeks.*
- The Applicant should provide documentation if USM has an existing Traffic Movement Permit. The TMP Application should also include trips associated with site changes implemented over the last 10-years.
  - *Evidence of an existing Traffic Movement Permit (issued with the Site Plan approval of the University Commons project in 2007) was provided to City staff under separate cover. As mentioned in the previous response, an application for a new Traffic Movement Permit has been submitted.*
- According to the analysis, USM will experience an increase of between 95 and 153 trips during the Weekday AM peak hour and between 113 and 174 vehicles during the Weekday PM peak hour. The study compared ITE Trip Generation estimates and local/site specific trip estimates. I have not fully reviewed the trip generation estimate methodology but will provide direction/approval during the TMP process. For the purposes of submitting a TMP Application, I

would suggest the applicant use the 7th Edition of the ITE Trip Generation Manual (or the 10th Edition if the pending TMP modified regulations are adopted prior to submitting the application).

  - *We used the 7th edition (and referred to the 10th as well).*

- For the purposes of assigning the new vehicle trips to the roadway network, the traffic impact analysis assumed a new parking garage would be constructed on Falmouth Street. The parking garage will not generate new traffic to the USM campus but will likely result in redistribution of vehicles arriving and departing the campus. This will be discussed at the TMP scoping meeting but would likely be required for the traffic study.

  - *The redistribution of traffic was incorporated into the traffic analysis, which was submitted to the City. The analysis was also incorporated into the Traffic Movement Permit application.*

- I briefly reviewed the Parking Assessment: Existing and Future Conditions prepared by VHB dated January 17, 2020. The assessment documents existing demand in USM parking facilities but does not appear to account for USM generated parking demand on public streets. The applicant should note if this information has been estimated or included in the assessment.

  - *The original parking analysis by VHB did cover public streets, but it was not included in the report submitted to the City because the focus of the report was campus parking. Since then, two memos have been submitted to the City that include analysis of street parking data. The second memo, dated 7/17/2020, includes an estimate of USM's contribution to street parking occupancy.*

Email from Ben Pearson, Compliance Coordinator, dated April 10, 2020

- A kitchen and pub are proposed but I did not see any grease control equipment planned. A schier great-basin 250 or equivalent high capacity grease interceptor is required to capture all dishwashing fixtures from the proposed food service facilities. There must be a junction manhole with independent channels at the location where the outlet of the grease interceptor connects to the sanitary sewer.

  - *A grease interceptor has been incorporated into the plans/design with appropriate manhole connections.*

Email from Michael Guethle, Stormwater Review Engineer (Wright-Pierce), dated April 23, 2020

- 1) Basic Standard: Per the City's Technical Manual Portland Stormwater Management Standards And Maine Dep Chapter 500 Stormwater Management, an Erosion & Sediment Control management plan, notes, and details per the Chapter 500 Rules must be provided to meet the Basic Standard.

  - *Acknowledged.*

  Erosion and Sedimentation Control best practices were observed on the Erosion and Sediment Control Plan and associated Details. An Inspection, Maintenance, and Housekeeping Plan has been provided with the erosion details and notes.

  a. In general, application of erosion and sedimentation control devices is appropriate. The following items need revision or review:

  i. Catch basin inlet protection should include catch basin throat inlet protection where necessary.

    - *Inlet protection will be included.*

  ii. Construction Entrance appears to be located in a low area of the site, near or in a catch basin area. Construction Entrances should ideally not be located in stormwater treatment areas or adjacent to catch basins. It is understood that this entrance is likely located at a

critical point for vehicle turning movements, and if the construction entrance cannot be moved, additional detailing on sediment transport mitigation in this location should be included in the construction management plan.

- *The construction entrance has been located at existing curb cut on Bedford St. Additional detailing pertaining to sedimentation transport mitigation will be provided.*

iii. Construction fence/limit of work appears to not be inclusive of some grading and pavement activities at the western boundary. Perimeter erosion control is recommended on this border as well.

- *The construction fence location has been modified to include all work areas.*

iv. Check dams should be provided on the southwestern boundary swale.

- *Check dams will be added to swale.*

- 2) General Standard: The applicant has provided information regarding the size and scope of the project, and has indicated the project is subject to the General Standard under the requirements of the Site Location of Development Act (SLODA). The project is being reviewed under the redevelopment guidelines and requirements.

  a. The applicant has provided an impact analysis to compare pre-development and post-development land use pollutant rankings under MaineDEP redevelopment guidelines. The written analysis indicated that the proposed development had a lower pollutant ranking than the existing site and is therefore required to treat 50% of the proposed site's disturbed surface area.

  A summary of pollutant rankings was provided. However, it is not clear which land use is being allocated which pollutant ranking. A visual or written description of site improvements and their allocated pollutant rankings should be provided.

  - *The stormwater report has been updated.*

  Please elaborate on the pollutant ranking selected for the roof areas. It is our understanding that the roof areas are flat, which is typically assigned a pollutant ranking of 3.

  - *The stormwater report has been updated.*

  Please also describe the general use of existing and proposed parking areas to better define their use as low-, medium-, or high- turnover parking areas.

  - *The stormwater report has been updated.*

  b. High-pollutant surface areas should be prioritized for stormwater treatment under the redevelopment standard. Please provide written or visual understanding of how priority for treatment has been assigned to high-ranking pollutants.

  - *The stormwater report has been updated.*

  c. One stormwater treatment system is provided as a "quad of lawn area". If the area is meant to be accessed by pedestrians as part of the site, it is suggested that the applicant provide a hardened access location to the basin, and review the proposed grasses to be suitable to both foot traffic, as well as submerged conditions.

  - *Stormwater treatment areas have been modified on the site. See revised plans.*

  d. An executed maintenance contract for the BMP systems is required. Given the difficulty in providing maintenance to courtyard-type stormwater treatment systems, please provide the executed maintenance agreement for this system as part of the application. Maintenance agreements for other treatment systems may be provided as a condition of approval.

  - *The stormwater report has been updated.*

- 3) Grassed Underdrained Soil Filter (GUSF) Design:

  a. A bioretention cell detail was provided. Please confirm if this detail is incorporated into the design.

    - *The detail has been adjusted to reflect proposed condition.*

  b. Additional design information in the stormwater management report is needed showing the following characteristics:

    The amount of impervious and developed area conveyed to the GUSF;

    Confirmation on the BMP sizing being a minimum of 5% of the impervious surface area and 2% of the developed surface area;

    Confirmation of basin areas, depth, media layers, and sizing;

    Maintenance access to the courtyard basin in accordance with Chapter 7.1 of the BMP manual;

    Sizing for sediment pretreatment for walkways and other sanded areas.

      - *The stormwater report has been updated.*

  c. Additional questions were developed from the HydroCAD calculation submission:

  GUSF outlets should be reviewed. GUSF outlets should include exfiltration rates in accordance with MaineDEP Chapter 500; underdrains conveying to the outlet control structure; and design for the outlet control structure inlets.

    - *The stormwater report has been updated.*

  Currently, exfiltration is modeled as a discarded value at 0.01 CFS, and outlets include a 20-foot overflow spillway which was not observed on the plans. Please revise.

    - *The stormwater report has been updated.*

  The filter basin should drain dry in no less than 24-hours and no more than 48-hours. The applicant has indicated that the filter basin drains 24-hours following the beginning of a rain event, but not that the system drains 24- hours following the basin filling, or following a water quality rain event.

    - *The stormwater report has been updated.*

  Please provide calculations indicating the basin draining 24-hours to 48-hours following either the basin filling to the ponding level, or following a 24-hour, 1-inch water quality rain event.

    - *The stormwater report has been updated.*

  Typically, this will require a reducer to the underdrain orifice, which will be adjusted in the field following construction. Please indicate that any reducer will be field-verified and adjusted in accordance with Chapter 7.1 of the BMP manual.

    - *The stormwater report has been updated.*

- 4) Flooding Standard: The applicant has submitted HydroCAD files indicating the post-development do not exceed the pre-development runoff rates for the facility. However, these calculations will need to be revised based on the above review comments for the GUSF designs.

    - *The stormwater report has been updated.*

- 5) Grading and Drainage:

  a. A Maine Construction General Permit will likely be required for the project due to the extent of grading.

- *Acknowledged.*

b. Typical details should show a maximum 2% cross-slope for sidewalks, crosswalks, and crosswalk portions of driveways and maintenance entrances.

- *Details and plans have been modified.*

c. Locations of level landings, and maximum slopes for regulated maximum distances, should be provided on the plans for ADA access locations.

- *Details and plans have been modified.*

d. For catch basin grates and frames to be re-set in the roadway, please provide a standard "dishpan" detail in accordance with the City Technical Manual.

- *Details and plans have been modified.*

e. Type F basins did not have a sump identified. The City Technical Manual includes a 3-foot sump for basins.

- *Details and plans have been modified.*

f. Not all pipes have inverts or rim elevations at this time, and were not able to be reviewed.

- *Details and plans have been modified.*

- 6) Utility Connections:

a. Ability to serve letters have not been provided for utilities impacted by the proposed project, but have been requested by the applicant for applicable utilities. The applicant has indicated that ability to serve letters will be submitted to Planning upon receipt.

- *Pending. SMRT is coordinating with Utilities.*

b. It is understood that grease trap sizing is being reviewed by Department of Public Works. Applicant shall defer to comments from Department of Public Works on this item.

- *Details and plans have been modified.*

i. A sewer cleanout should be provided at the intersection between the grease It is understood that grease trap sizing is being reviewed by Department of Public Works.

- *Details and plans have been modified.*

ii. An oil-water separator detail was provided, please confirm if this is the detail for the grease trap. If an oil-water separator is proposed, please confirm its location on the plan.

- *Details and plans have been modified.*

c. Standard design for the water and fire system has been provided. Adherence to PWD standards is typically provided by the water utility for water connections, and would be addressed in an ability to serve letter and acceptance through PWD.

- *Pending. SMRT is coordinating with PWD.*

d. Standard design for the electrical and gas utilities has been provided.

i. An existing gas line is located near CB 2235. Please confirm if the gas in this location is to be abandoned or removed, and if the GUSF adjacent to the gas line will have a liner.

- *Details and plans have been modified.*

e. Connection to Existing Stormwater Systems: E-mail, or otherwise written, confirmation from the Department of Public Works accepting this connection is requested to confirm that this connection is appropriate under Land Use section 14- 526 (b) 3 a. (iv); and 14-526 (c) 3 a.

- *Pending – SMRT is coordinating with the Department of Public Works.*

f. Planting impacts to utilities:

i. Several plantings are located over underground utilities, or beneath overhead wires. Please confirm how the design incorporates mitigation or prevention for roots impacting underground utilities, or canopy expansion impacting overhead wires.

- *Planting is being coordinated with utilities. Some overhead utilities are likely to be removed.*

ii. For installation adjacent to stormwater BMPs, please confirm how stormwater BMP liners (if any) are incorporated into the design.

- *Liners are not being utilized.*

Updates to Application Materials

Since submitting the Site Plan Application, the following updates and additional materials are provided in support:

- A virtual neighborhood meeting was held on July 15, 2020, at 6:00 pm regarding the Level III Site Plan Submittal for the proposed project; enclosed is a letter certifying that the neighborhood meeting was held, in addition to copies of the meeting invitation, attendance list, and meeting notes.
- The Site Plans have been revised as follows:
  - The CSSC building size has been reduced from 60,000 square feet to 43,000 square feet, and the location on the site has been adjusted slightly. Accordingly, the service yard and loading dock have been modified. All access points from perimeter streets remain the same. Minor modifications to internal sidewalks have been made to align with building modifications.
  - Stormwater management areas have been adjusted on site based on building location changes and client requests. Stormwater management has been designed in accordance with Chapter 500 regulations.
  - Curb cuts and proposed on-street parking along Durham Street have been reviewed with adjacent neighbor Oakhurst Dairy to coordinate with their truck movement.
- The building renderings and elevations have been revised as described in the attached Design Narrative.
- The Logistics Plan that accompanies the Construction Management Plan has been updated to reflect the site changes.
- USM has completed additional on-street parking analyses at staff's request. The analyses are summarized in the attached "On Street Parking Adjacent to Portland Campus" memo dated July 17, 2020.

If you have any questions or require additional information, please do not hesitate to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

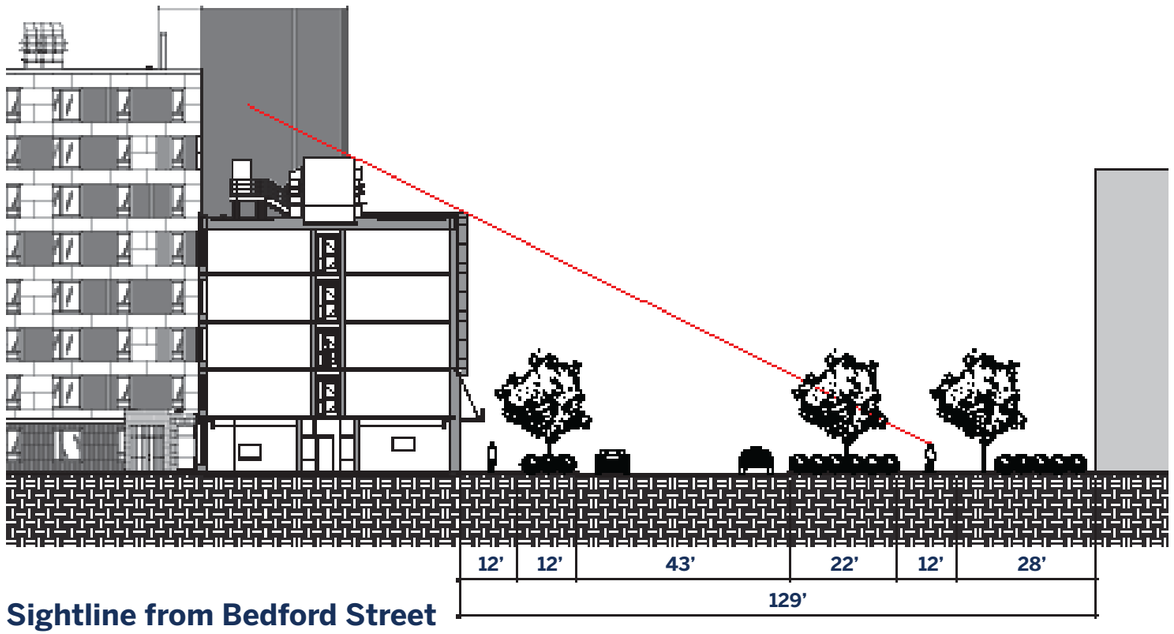
WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

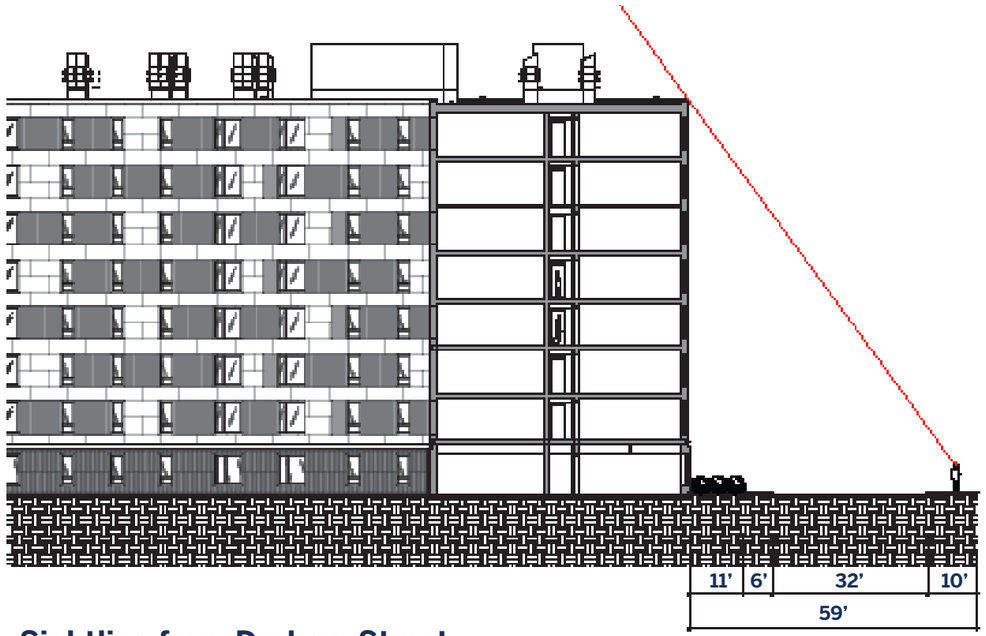
cc: Alexander Porteous, University of Southern Maine
Craig Piper, SMRT Architects
Mary Costigan, Bernstein Shur

Enclosures: Design Narrative, June 4, 2020
Neighborhood Meeting Materials, July 15, 2020
Revised Renderings, July 23, 2020
Revised Site Plans, July 24, 2020
Stormwater Report, Revised July 24, 2020
Updated Lighting Cut Sheets
Construction Logistics Plan June 30, 2020
Portland Commons Residence Hall - Preliminary Plan for Summer/Fall Move-In Plan
USM On Street Parking Adjacent to Portland Campus July 17, 2020

Sightline Diagram

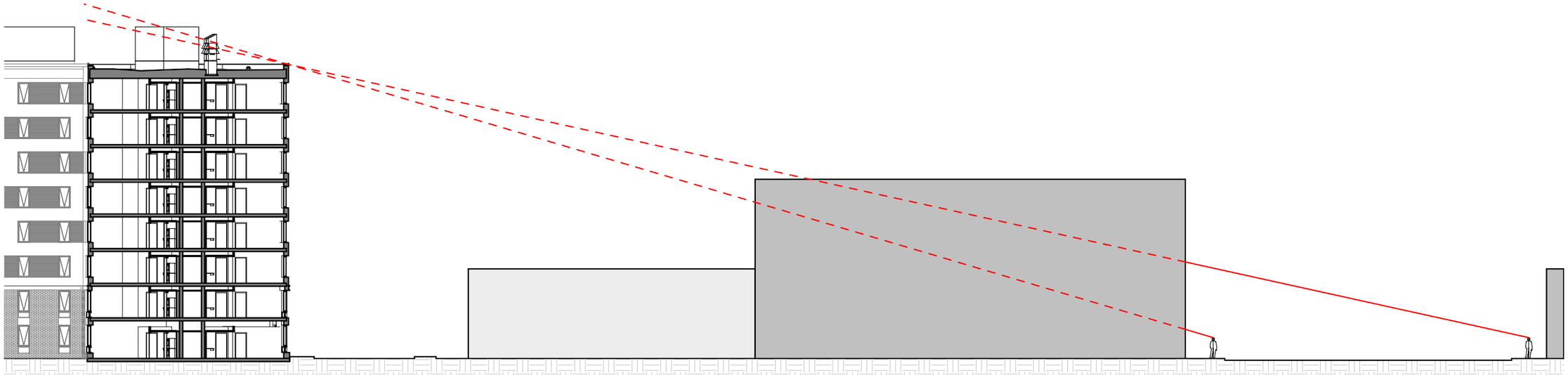


Sightline from Bedford Street



Sightline from Durham Street

Sightline Diagram



Sightline from Forest Ave

UNIVERSITY OF SOUTHERN MAINE

FACILITIES MASTER PLAN







Final, BOT Approved
January 27, 2019

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Facilities Condition Analysis

EXECUTIVE SUMMARY







The Facilities Master Plan (The Plan) is a university-wide evaluation of the University of Southern Maine (USM) campuses at Portland, Gorham and Lewiston-Auburn. The plan incorporates the visions, goals, facilities assessments, and the campus space needs assessments into a set of campus physical development recommendations. These recommendations not only address today's needs but also establish the long-term development potential for each campus.

Established to better serve the students and communities of southern Maine, USM's three campuses are all important to serving a diverse student body.

History

On December 26, 1878, Corthell Hall, the first university building of what would later become USM, was dedicated to the education of teachers in the town of Gorham. In 1918, Portland University opened just off Monument Square in downtown Portland in response to the lack of educational opportunities for accountants and business professionals needed for the economic growth of the City and region. These two institutions became the keystones of the University of Southern Maine, which in 1988 opened Lewiston-Auburn College to serve the needs of the growing metropolitan area north of Portland.

Today, the Portland Campus has 839,000 GSF of facilities with a fall 2017 headcount of 5,277. Portland's enrollment is the largest of the three campuses. Many of the Portland students reside on the Gorham campus or from adjacent off-campus housing along with commuters from other southern Maine communities. Ten miles away, the Gorham Campus has 1,168,000 GSF of facilities with a fall 2017 headcount of 2,570. The only campus with residence halls, Gorham houses approximately 1,200 students. About 35 miles away from the other two campuses, the Lewiston-Auburn Campus has 450,000 GSF of facilities with a headcount of 374.

Process

The Plan is a result of an inclusive, comprehensive, and strategic process involving a broad community constituency including students, staff, administration, faculty, alumni and representatives from the City of Portland and Town of Gorham.

In June of 2017, President Cummings charged a Campus Master Plan Steering Committee (CMPSC) to create The Plan with the support of its consultant team lead by the Maine based architectural and engineering firm of Harriman Associates. A three-phase process implemented through monthly meetings created a framework in which important ideas and direction were provided by the CMPSC to the consultant team. In addition, the consultant team met with selected faculty and staff and the CMPSC hosted forums and open house events at each of the campuses. The final plan is a product of this process led by the CMPSC and informed by campus facilities and space needs analysis.







Goals and Guiding Principles

The Plan process was guided by President's Cummings Goals and Guiding Principles created by the CMPSC for the University's physical development.

PRESIDENT'S GOALS

- USM will be known for academic excellence with real-world experiences as a core part of its academic program.
- 80% of our students will state that at least one individual (staff or faculty) knows them well, supports them, and believes in them.
- 72% of our students will remain at USM between each school year.
- 10% of our alumni will give to USM annually.
- The USM Foundation will raise $50 million in scholarships, infrastructure,and investments for our students.
- USM headcount enrollment will reach 10,000.
- USM will be designated as a 'Great Colleges to Work For®'.
- 80% will recommend USM to others.
- USM will establish a sustainable financial model by attaining industry standards attributable to a financially healthy institution.

CMPSC GUIDING PRINCIPLES

- **Student Experience**—the process, plan and implementation focuses upon improving the student's academic, co-curricular and living experience on each of the campuses.
- **Inclusiveness**—the process, plan and implementation support the ability of any member of the community to feel safe participating and being included as a valuable member of the USM community.
- **Net Zero Building Policy**—the plan prioritizes the capital renewal of existing facilities that are capable of, with investment, meeting the academic mission over building new facilities.
- **Public Safety**—the plan and subsequent implementation seeks to provide the safest campus environment possible through physical, programmatic and operational improvements.
- **Mobility**—the plan supports robust pedestrian, bicycle, shuttle bus, ride share and metro regional public transit systems that look beyond private vehicular parking to meet the transportation needs of the campus community.
- **Sustainability**—the plan supports all existing sustainability policies of the University.
- **Neighbors**—the plan seeks to establish campuses and campus communities that are positive members of the neighborhoods, mitigating negative impact and providing a beautiful and inviting campus landscape for all neighborhood members to enjoy.
- **Aesthetics**—the visual quality of the campus facilities is important to creating an environment that meets the mission and goals of the University.


HALL

The Portland Plan

> "To build a sustainable, iconic academic campus in the heart of Portland enhancing the commuter experience while creating a welcoming residential community."

The Portland Plan envisions a transformational future for the campus. This vision is supported by the long-term framework of physical attributes and is assembled to create a dynamic and flexible campus.

The circulation "frame" around the campus consists of US 295, Forest Avenue, Falmouth and Deering Street. Gateways into the campus are Forest/US295 and Falmouth and Deering Ave. The framework illustrates the simplicity of two greens lined by campus buildings and connected by campus circulation. The beauty of this framework is its ability to provide a flexible and bold future.

To accomplish the vision and create transformational moves that improve experiences for both commuter students and the new residential population, the plan carefully sites the development program and other campus improvements. The placement of facilities creates a new campus heart and identifies iconic sites for new large projects and additional growth within the current campus land holdings. A new campus quadrangle is created by combining several near-term projects including a new Career and Student Success Center, residence halls and significant landscape improvement.

Beyond the new campus heart, the Portland Plan identifies prominent iconic sites for a Center for the Arts and a new Professional Graduate Center. The first iconic site is located between the Wishcamper Center and the interstate, and the second is located by what is currently the Brighton Avenue extension. The key difference between the two is that the site behind Wishcamper has more regional visibility and is adjacent to the existing parking deck, while the Brighton Avenue Extension site has prominent neighborhood visibility and is on the campus pedestrian spine; however, either site can be a home for transformative programs beyond the two that have been identified in the planning process.

The largest land area for future development becomes available once the Professional Graduate Center is built and the current law school is demolished. The law school site with the existing surface parking lot could also be thought of as an iconic site, although it is at the campus/neighborhood edge and across Deering Avenue. Other future development sites include a site in front of the parking deck, between the Science Building and the Sullivan Complex and a small site west of Masterson Hall.



400,000 GSF | *Site available for academic, housing, parking or athletic growth beyond current program*

The Gorham Plan

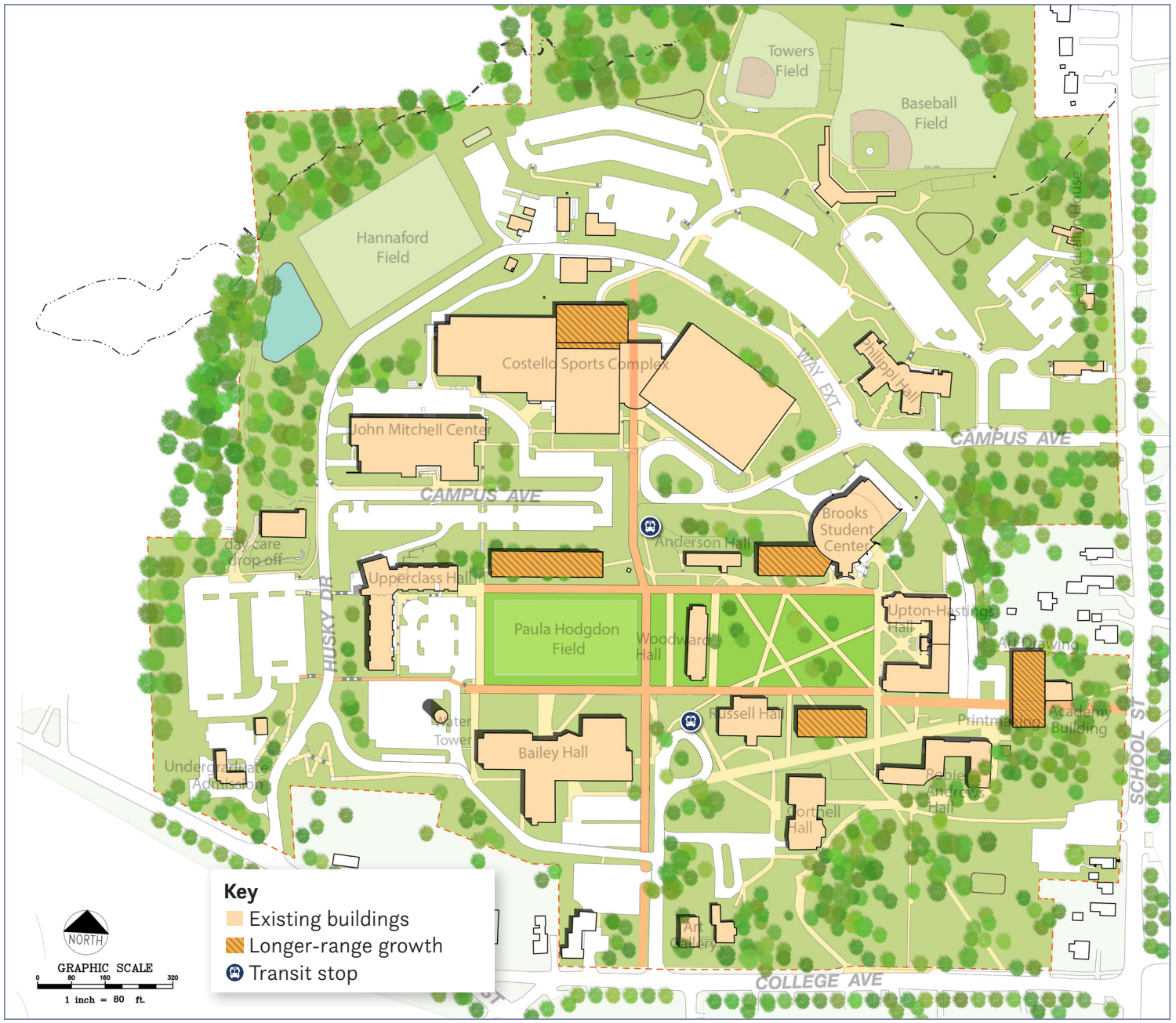
> "To sustainably strengthen an iconic campus focused upon the academic experience with an emphasis on campus life."



The Gorham Plan is built upon reestablishing a campus heart and providing a clear and safe pedestrian circulation system. The campus will be supported by efficient vehicular circulation that does not dominate the campus landscape. Providing a flexible and bold framework for future development, the plan illustrates the simplicity of reestablishing the campus green and connecting it to the larger campus and the Town of Gorham.

To fulfill the vision and create transformational moves that improve the student experience, the Gorham Plan recommends renewal of the campus heart and identifies sites for additional housing and academic sites to be built as they are needed.

A place for the Gorham campus community to come together, the renewed campus quad would be located at the top and center of the campus. To begin re-establishing the campus heart, a surface parking lot behind Russell Theater would be removed, and University Drive would be redesigned to be more pedestrian friendly. Complementing these landscape improvements would be capital renewal projects including the Campus Center and historic core structures such as Russell Hall, Robie-Andrews Hall, and Corthell Hall.


Towers Field
Baseball Field
Hannaford Field
Costello Sports Complex
John Mitchell Center
CAMPUS AVE
WAY EXT
Philippi Hall
Woodruff House
CAMPUS AVE
day care drop-off
Upperclass Hall
HUSKY DR
Anderson Hall
Brooks Student Center
Paula Hodgdon Field
Woodward Hall
Upton-Hastings Hall
Art Drawing
Academy Building
SCHOOL ST
Water Tower
Russell Hall
Printmaking
Bailey Hall
Undergraduate Admission
Bobier Andrews Hall
Gorrell Hall
Art Gallery
COLLEGE AVE
Key
Existing buildings
Longer-range growth
Transit stop
NORTH
GRAPHIC SCALE
0 80 160 320
1 inch = 80 ft.

Lewiston-Auburn

In order to ensure alignment between academic offerings and a master plan, it was decided early in the process to postpone a master plan for the Lewiston-Auburn campus until a review of current and future academic programming for the campus was completed.

INTRODUCTION

USM Overview

The University of Southern Maine (USM) serves approximately 8,000 students at its campuses in Gorham, Portland and Lewiston-Auburn. The University of Maine School of Law, located on the USM Portland Campus, is also a part of the USM community.

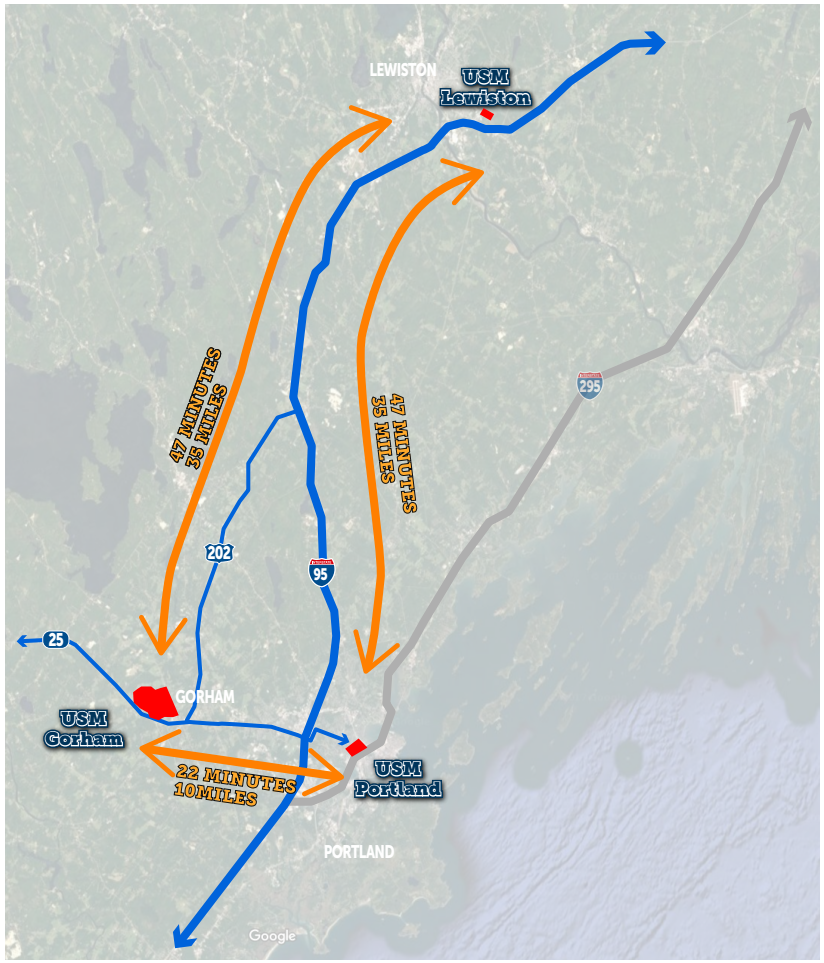
Over 87% of USM students are from Maine. Out-of-state students come principally from neighboring New England states.

The three campuses possess extremely different physical facilities:

- The Portland Campus, where most USM students attend their classes, is approximately 34 acres with 1,246,558 GSF of facilities.
- The historic Gorham campus sits on 96 acres, accommodating 1,168,000 GSF of buildings. The Gorham Campus Historic District includes 12 of the university's 125 acres and seven buildings added to the National Register of Historic Places in 1978.
- The Lewiston-Auburn campus sits on 10 acres and hosts 140,000 GSF in one building.

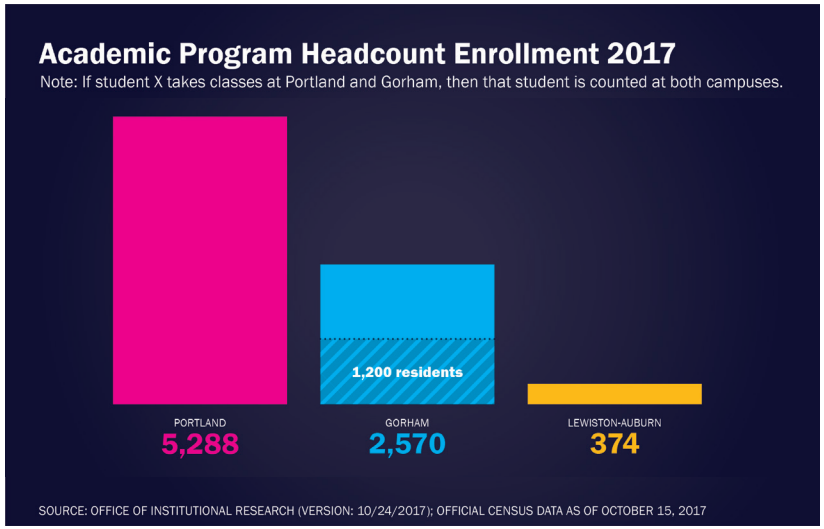
There is significant capacity at each campus for further development outside of what could be considered long-term strategic land acquisitions at each campus.

The University of Southern Maine, like its other University of Maine System counterparts, contends with the constant challenge of limited resources to address capital renewal and reinvestment. The lack of available funding has contributed to a growing backlog of deferred maintenance to campus buildings and grounds. Sightlines, a facilities management firm, estimates that USM campuses require $270 million to address maintenance and renewal.

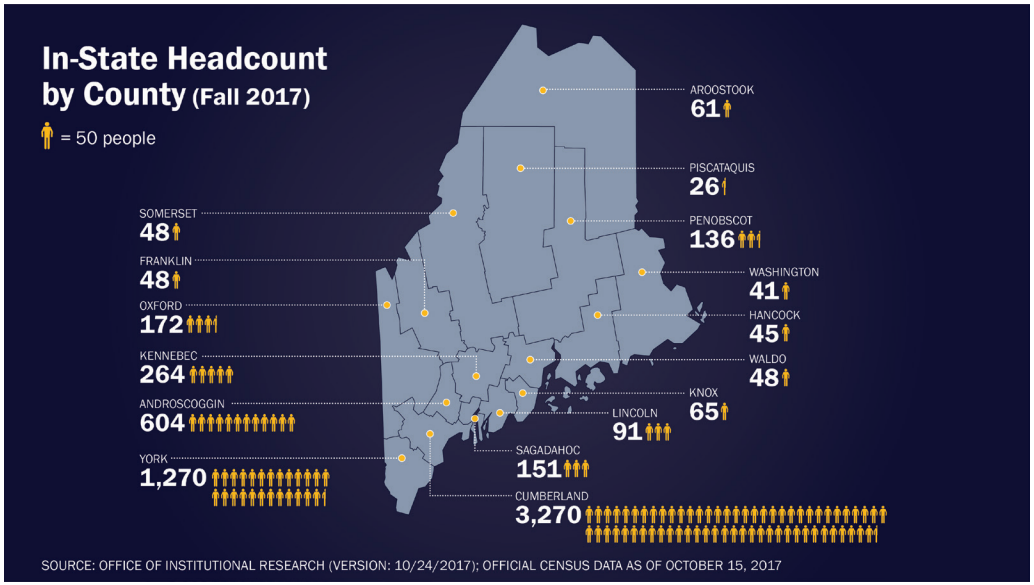


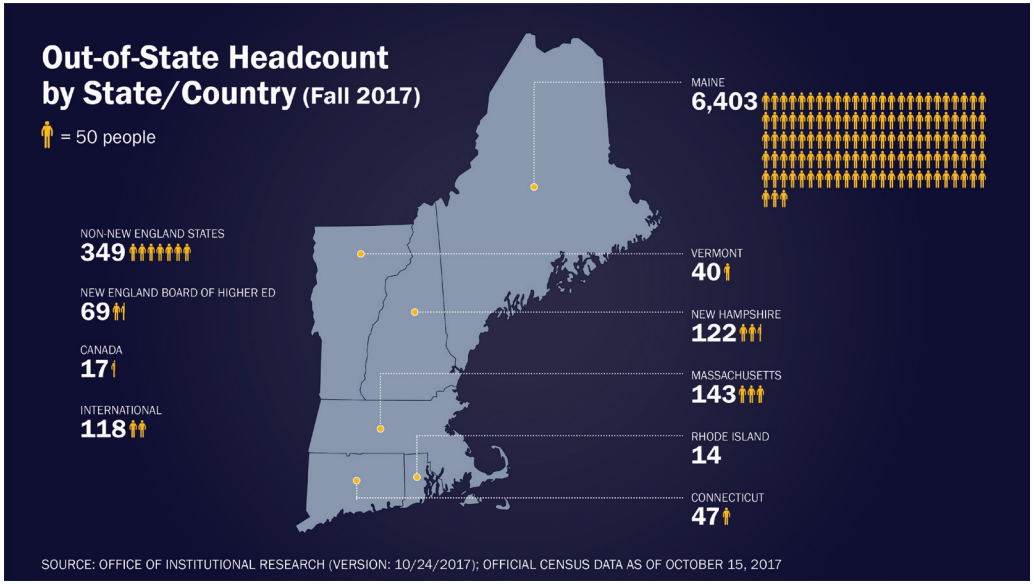
CAMPUS FACTS

USM CAMPUS	GROSS LAND AREA (AC)	BUILDING FLOOR AREA (SF)	FAR	PARKING SPACES
Portland	34	1,246,558	1.19	1,720
Gorham	96	1,168,000	0.28	1,600
Lewiston-Auburn	10	140,000	0.31	380



Note: The numbers are approximate.





Purpose

This Facilities Master Plan (The Plan) is a University-wide evaluation of the University of Southern Maine at Portland, Gorham and Lewiston-Auburn that combines detailed assessment, campus space needs assessments, and campus planning recommendations to address current, short-term and long-range needs. The Plan will be used to as an important policy document for state capital funding and the University's development efforts.

USM President's Goals

- USM will be known for academic excellence with real-world experiences as a core part of its academic program.
- 80% of our students will state that at least one individual (staff or faculty) knows them well, supports them, and believes in them.
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- 10% of our alumni will give to USM annually.
- The USM Foundation will raise $50 million in scholarships, infrastructure,and investments for our students.



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- USM will be designated as a 'Great Colleges to Work For®'.
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- USM will establish a sustainable financial model by attaining industry standards attributable to a financially healthy institution.

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- **Aesthetics**—the visual quality of the campus facilities is important to creating an environment that meets the mission and goals of the University.

University Wide Sustainability

The facilities master plan envisions sustainability as a critical element underlying all new construction and considerations for renovations and renewal of existing buildings. As such, the Master Plan Steering Committee endorses the Campus Sustainability Strategic Plan, published in October of 2017.

- New buildings will support our Second Nature President's Carbon Commitment to be carbon neutral by 2040, following Portland's District 2030 benchmarks.
- We strive to achieve a 70% reduction in energy usage for each new building compared to the national average
- We strive to achieve a 50% reduction in water usage for each new building compared to the district average
- We strive for LEED silver certification or above
- We strive to incorporate innovative and sustainable local materials whenever possible, including elements like Cross Laminated Timber (CLT)
- We strive for a 35% reduction in heat and electricity emissions for existing buildings
- Transportation Demand Management (TDM) will be a subsequent study to help achieve the commitment of a 20% greenhouse gas reduction

Process

The Plan for USM is the result of an inclusive, comprehensive, and strategic process involving a broad community constituency including students, staff, administration faculty, alumni community leaders and representatives for the Towns of Portland and Gorham. Guided by the planning team of Harriman, Goody Clancy and Rickes Associates, the Campus Master Plan Steering Committee (CMPSC) provided important guidance, questions and feedback throughout the process. In addition to monthly steering committee meetings, members met with faculty, staff and students, as well as with neighborhood residents at meetings and open forums. There were thirteen steering committee meetings, 3 stakeholders meetings and 4 public forums over the past ten months. The final master plan derived from this process of community input, planning analyses and aspirational visioning.

The master planning process consisted of three phases: Analysis and Investigation, Concept Plan and Facilities Master Plan.

ANALYSIS AND INVESTIGATION

The existing Mission and a variety of institutional planning materials were reviewed for the planning team to gain an understanding of the needs, goals and institutional priorities at each of the USM campuses.

The planning team and CMPSC subsequently spent time on each campus to understand the current state of the campuses and their various features. Attention was paid to use patterns, building and site conditions, visual character, zoning and historic areas, and pedestrian and vehicular circulation. The planners analyzed the impact of regulatory requirements on the campus by reviewing state and local ordinance.

The team compiled capital improvement recommendations to inform planning decisions and short-term maintenance needs. The information was compiled and is incorporated into this report.

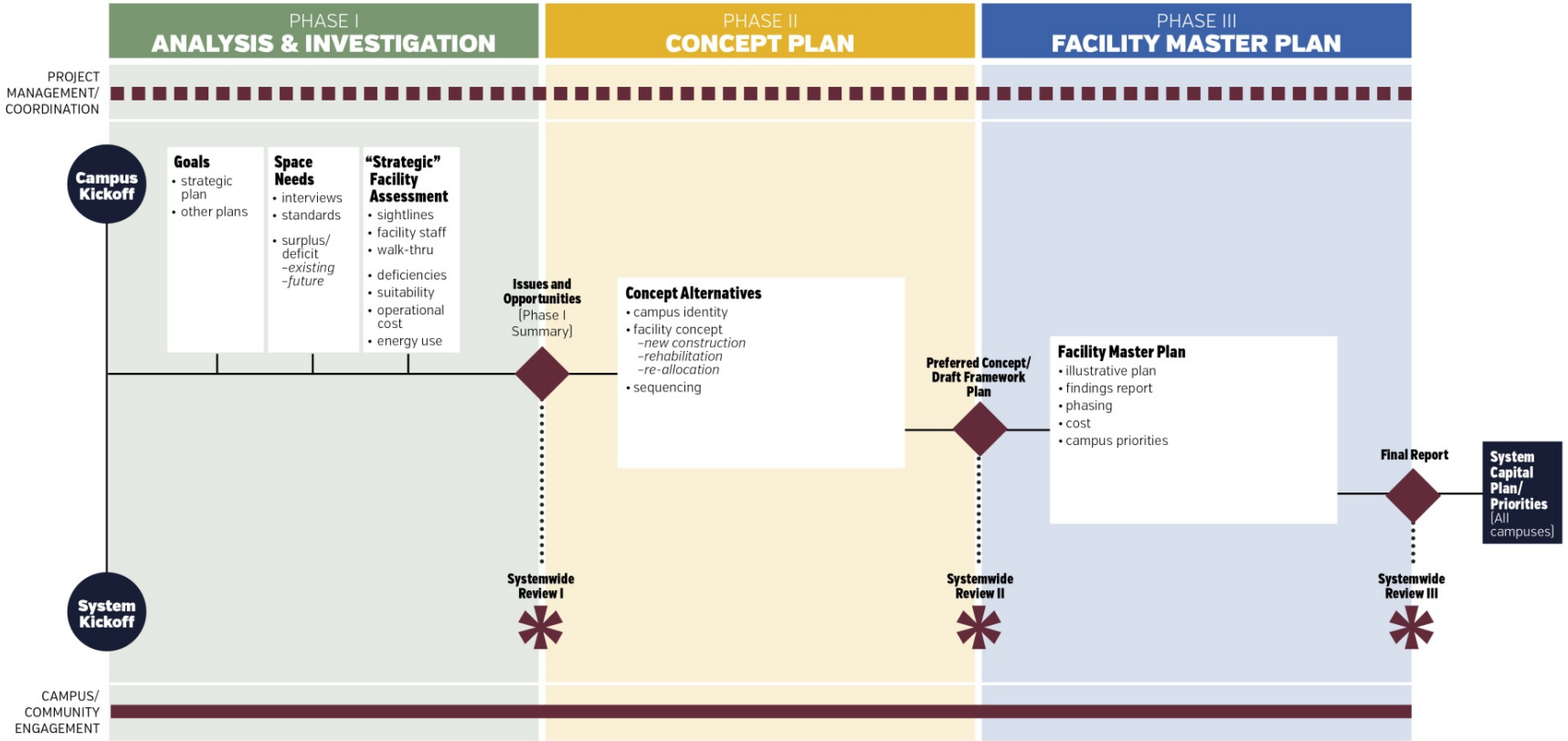
During this phase the team also met with academic and program leaders at each campus to ascertain current and future program needs and collected registration, class scheduling and personnel data to prepare the space utilization and needs analysis. The conclusions of this Space Needs Analysis for each campus are presented in an appendix at the end of this report.

CONCEPT PLAN

Using information gained during the Analysis and Investigation Phase, the Steering Committee with its consultants explored and developed conceptual options for the Portland and Gorham campuses. During this phase, options for the Lewiston-Auburn campus were postponed until a review of current and future academic programming for the campus is completed.

FACILITIES MASTER PLAN

Once the preferred concepts for the Portland and Gorham campuses were determined, the team developed and refined the campus plans in greater detail. The draft plan was shared with community members, USM employees and other interested parties through a series of 4 open forums. Capital renewal and new building projects were incorporated into the final master plan, with both short-term and long-term direction for capital investment and campus development. These initiatives, some of which were identified by previous studies, are integrated with current project priorities.



Planning Phasing Categories

To meet immediate facility needs and allow for aspirational visioning, three categories were created to organize the Master Plan Program Elements.

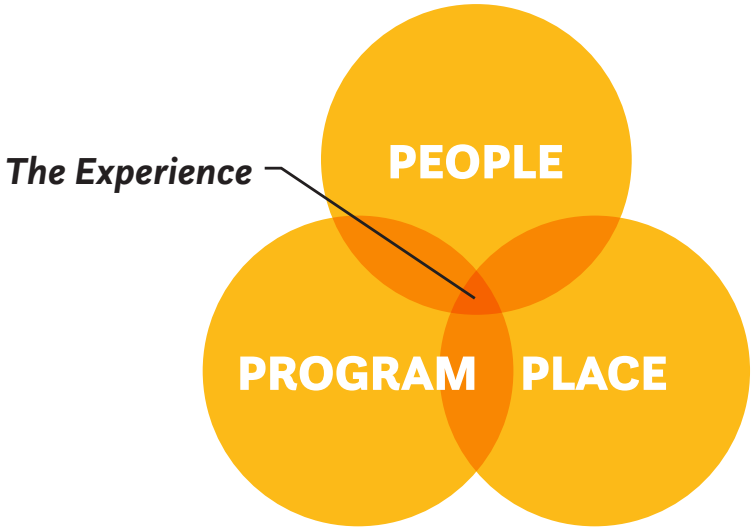
- The first category includes immediate facilities and space need deficiencies. Elements or items in category 1, immediate must-haves, are generally considered to be 'broken" and require immediate repair.
- The second category includes, short-term needs targeted within a 3- to 5-year window. The most transformational elements are designed to occur within the category 2 timeframe.
- The third category includes long-range needs based on the future growth in a 5- to 20-year timeframe. Items in category 3 are designed as placeholders to accommodate significant enrollment and or changes in academic needs.

1. **Immediate must-haves**
   - > Facilities issues
   - > Program exigencies
2. **Short-term—3-5 years**
   - > Facilities
   - > Program
   - > Campus
3. **Long-range— 5-20 years**
   - > Framework for aspirational planning
   - > Based on future growth



"Today's decisions create the long-range vision"

Scope of Master Plan



A successful Facilities Master Plan must integrate:

> **People**—students, faculty, staff and neighbors

> **Program**—teaching, research, campus life and outreach

> **Place**—buildings and infrastructure

The Campus Master Plan Steering Committee (CMPSC)

CO-CHAIRS

Jeannine Uzzi, Provost

Cyrus Hagge, USM Foundation

COMMITTEE MEMBERS

Cathy Clements, Classified Staff Senate Representative and Administrative Support Supervisor,Office of Admissions

David Cole, Gorham Community Representative and Former Gorham Town Manager

Ashley Collins, Professional Staff Senate Representative and Director of Prior Learning Assessment

Dean Joyce Gibson, LAC Campus Representative

Nancy Griffin, VP Enrollment Management and Student Affairs

Trevor Hustus, Chair of the Student Senate and UM System Trustee

Alan Kaschub, Director of School of Music

Professor Jerry LaSala, Department of Physics and Director of Southworth Planetarium

Joe Menard, Executive Chair of the Commuter Student Association

Buster Neel, Interim Chief Business Officer

Ed Suslovic, Portland Community Representative and Portland Metro Board Member, Former City Councilor and Legislator

Aaron Witham, Assistant Director for Sustainable Programs

Averi Varney, Student Government Senator

EX OFFICIO MEMBERS

Joan Cohen, USM President's Liaison

Jessica Picard, Assistant Director Finance & Administration for Facilities, Logistics for Committee

John Souther, Executive Director of Facilities Management

Bob Stein, Executive Director of Public Affairs

Consultant Team

Harriman is an integrated architecture, engineering and planning firm with offices in Maine, New Hampshire and Massachusetts. We collaborate with Colleges and Universities on a variety of infrastructure and building projects. Harriman has partnered with the University of Maine System on several projects including this USM Facilities Master Plan.

Goody Clancy is a Boston-based planning, architecture, and historic preservation firm. that creates achievable visions at all scales—from entire campuses to the smallest detail of a building. In 2017 they were participating in 76 projects on 32 college campuses in 16 states.

Rickes Associates has worked with over 200 institutions on nearly 400 projects, in 25 states and internationally. Its client base is comprised of public and private higher education institutions in all sectors, including research universities, liberal arts colleges, community colleges, faith-based institutions, HBCU's, women's colleges, and system offices.


THE
PORTLAND
PLAN
Brighton Ave
Deering Ave
Chamberlain Ave
Washburn Ave
Exeter St
Granite St
25
302

Introduction

The USM Portland campus has the largest enrollment of the three campuses with a fall 2017 headcount of 5,277. All are commuter students.

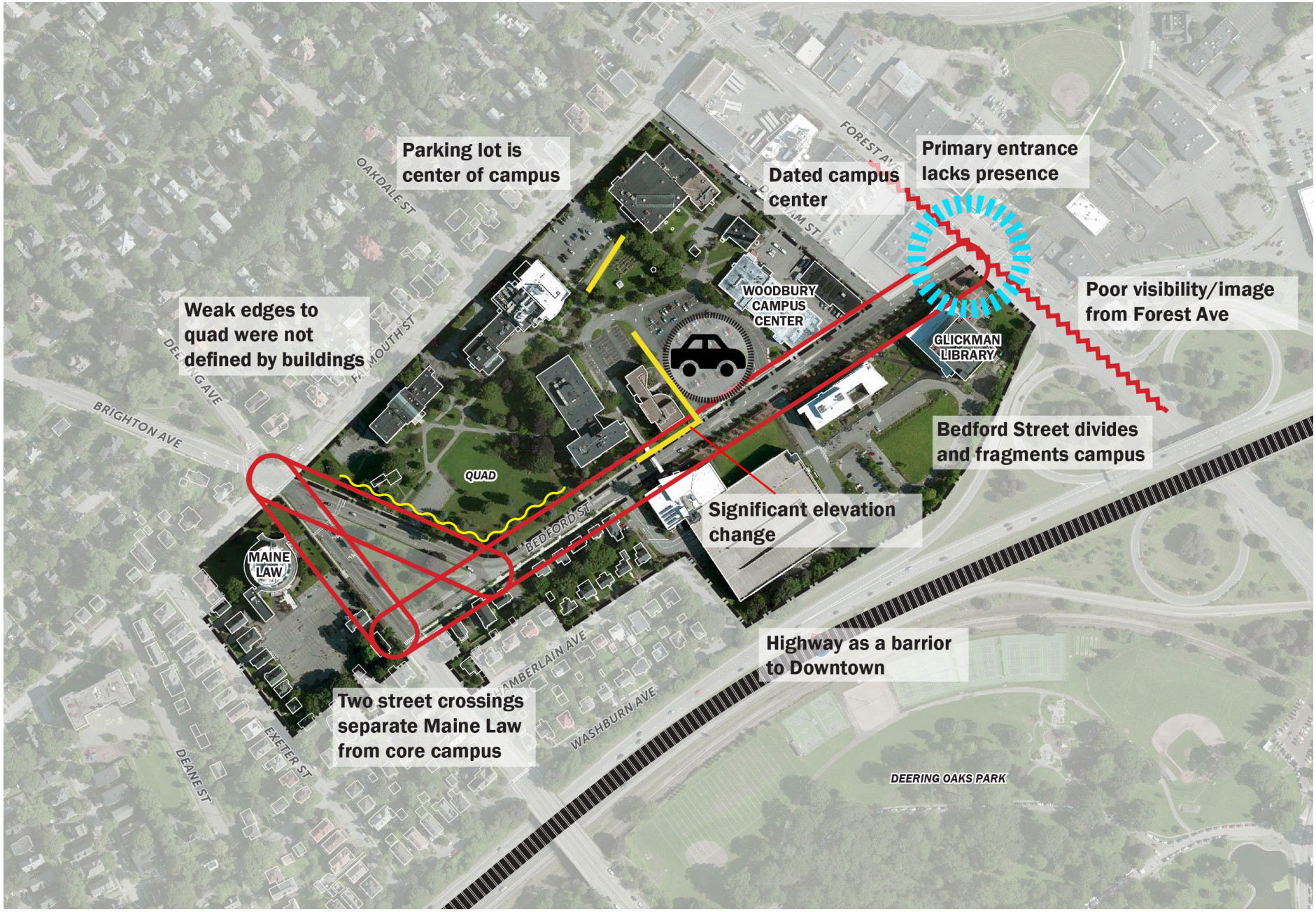
The Portland campus encompasses approximately 30 acres, with 27 buildings comprising 820,829 assignable square feet (ASF). The ASF, excluding the parking garage and unclassified space, is 425,729 ASF. This reflects the core campus space including classroom, laboratory, office, library, special and general use, health care, and central facilities.

Located less than one mile from the heart of downtown Portland, the Portland campus provides excellent access to social, cultural and internship opportunities. Linked to the Gorham campus ten miles to the west and the city center via frequent bus service, the Portland campus also has convenient access and visibility from Interstate-295, with Forest Avenue serving as the primary arrival point. A second important arrival point onto the campus is at the intersection of Deering, Brighton and Falmouth Streets, soon to be transformed into a roundabout. Bedford Street bisects the campus providing access to most of the parking supply for the campus.

The campus is in a completely developed urban neighborhood. The adjacent land consists of Interstate Highway 295 on the east, commercial uses on the north and residential uses on the west and south. The largest adjacent land use is the Oakhurst Dairy distribution center between the campus and Forest Ave. The adjacent residential areas provide housing for some of USM's students but are generally a set of very solid and cohesive neighborhoods.

The campus open space character is inconsistent in quality and design. The best open space on campus is currently defined by the Brighton Avenue Extension on the south, Bedford Street on the east, Luther Bonney on the north and Payson Smith Hall on the west. It is enhanced by several large deciduous trees dabbled through the space. Most of the other campus open spaces are interstitial spaces between buildings. The space with the most potential for campus transformation is the parking lot between Woodbury Campus Center and Masterton Hall.

The existing campus with a clear perimeter circulation, well-located gateways, and the arrangement of existing buildings all presents great opportunities for a strong campus framework capable of supporting considerable future growth.


Parking lot is center of campus
Dated campus center
Primary entrance lacks presence
Poor visibility/image from Forest Ave
Weak edges to quad were not defined by buildings
Bedford Street divides and fragments campus
Significant elevation change
Highway as a barrior to Downtown
Two street crossings separate Maine Law from core campus
WOODBURY CAMPUS CENTER
GLICKMAN LIBRARY
QUAD
MAINE LAW
OAKDALE ST
FALMOUTH ST
BRIGHTON AVE
BEDFORD ST
CHAMBERLAIN AVE
WASHBURN AVE
EXETER ST
DEANE ST
DEERING OAKS PARK

The Portland Plan

The following sections describe the facilities master plan for the Portland campus. Recommendations were the result of the analytical work and the planning process conducted by the CMPSC and its consultants with feedback and input provided internal and external stakeholders.

VISION

The vision for the Portland campus is grounded in today while being aspirational toward the future.

> "To build a sustainable, iconic academic campus in the heart of Portland enhancing the commuter experience while creating a welcoming residential community."

SUSTAINABILITY

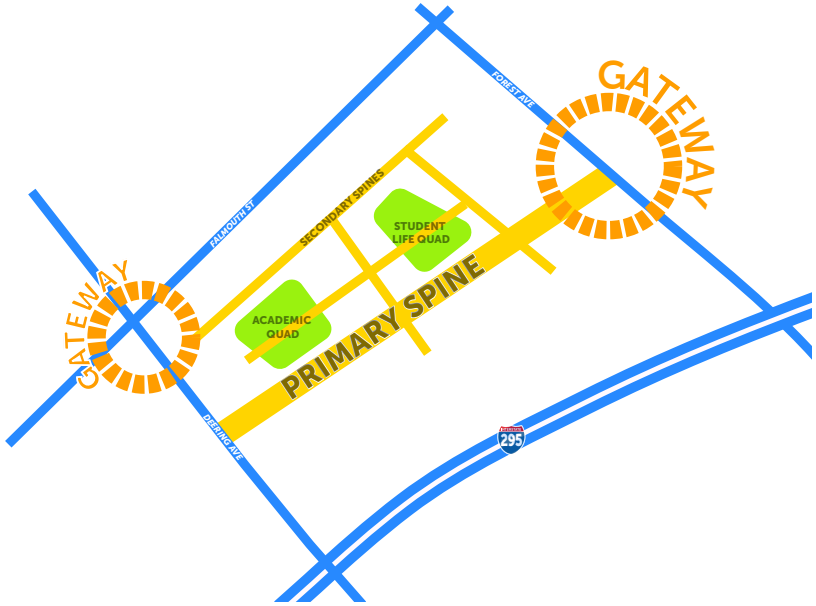
USM, as a 2007 signatory of the President's Carbon Commitment (formerly the American College and University Presidents' Climate Commitment), is working toward the goal of climate neutrality by 2040. The commitment requires the University to adopt several actions to reduce emissions of the six greenhouse gases addressed under the Kyoto Protocol, the most significant of which is carbon dioxide (CO_2). The Carbon Commitment also requires the University to develop a Climate Action Plan, establishing target dates for achieving climate neutrality; identify interim milestones; provide strategies for engaging the campus body in relevant research; and set out actions to make climate change and sustainability part of the curriculum. In October of 2017 USM's Climate Action Plan became part of the broader Campus Sustainability Strategic Plan structured on three content areas:

- **Energy** (energy reduction projects, minimum new construction benchmarks, increased sustainable transportation infrastructure and options)
- **Material Resources** (waste reduction and avoidance, recycling, and re-use efforts
- **Education and Outreach** (professional development for students, hands-on experiences improving campus, and increase eco-literacy)

To support the existing President's Carbon Commitment and to demonstrate sustainability leadership in the local community, the Master Plan Steering Committee recommends that the University sign the Portland 2030 District Commitment, whose benchmarking goals for new and existing buildings have been adopted in this Master Plan.

MASTER PLAN FRAMEWORK

The long-term framework describes the important physical attributes of the campus and how they are assembled to create a resilient and legible campus. The circulation "frame" around the campus consists of US 295, Forest Avenue, Falmouth Street and Deering. Gateways into the district remain unchanged. The framework illustrates the simplicity of two campus greens connected by campus circulation providing a flexible and bold framework for future development.



DEVELOPMENT PROGRAM

The Portland development program continues and expedites USM's capital renewal program and begins to build facilities that allow the campus to meet its vision. The program has been categorized into time periods in which the program requirements need to be developed.

Immediate (Now)

- **Continuing Capital Renewal**—This will be a continuation of the program the University has been managing over the past several years in which buildings and spaces in critical deferred maintenance are addressed. Payson Smith Hall, Luther Bonney Hall and the Science Building are all top candidates for investment as funding becomes available. The renovation of these buildings presents the opportunity through redesign of space to explore meeting some of the office and specialized classroom needs identified in the space needs analysis.

Short-Term (3-5 years)

- **Career and Student Success Center**—This building will replace the dining and cocurricular activity space currently in the Woodbury Campus Center. In addition, the vision for this building is to provide a common place for programs and functions which support both the academic success and long-term professional success of the USM student The building is anticipated to be approximately 40,000 GSF.
- **Student Housing**—The introduction of residence halls on the Portland campus is expected to be delivered in two phases: the first phase 400 beds and the second phase consisting of an additional 200 beds. It is anticipated that this will be built to accommodate upper class undergraduate students and graduate students.

PROGRAM ELEMENTS

Immediate

- Continuing Capital Renewal

Short-Term

- Career and Student Success Center
- Student Housing
- "Quad"
- Graduate Center for Professional Studies
- Center for the Arts
- Transportation

Long-Range

- Housing
- Academic

ILLUSTRATIVE IMAGES OF COMPARABLE PROGRAM ELEMENTS



Career and Student Success Center



Graduate Center



Interior of Student Housing



Quadrangle



Performance Space

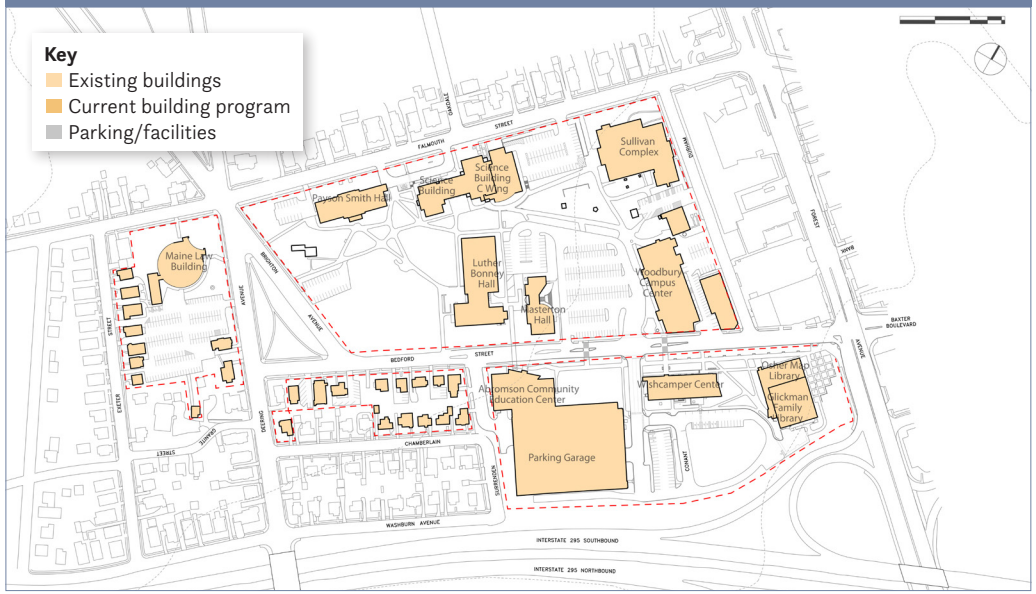
- **"Quad"**—A key component of the transformation of the Portland Campus is a second campus open space, located adjacent to the residence halls and the Career and Student Success Center.
- **Graduate Center for Professional Studies**— A new Graduate Center is anticipated to accommodate and integrate three primary programs: the University of Maine School of Law, a University of Maine MBA Program and possibly the Muskie School of Public Service. It is anticipated that the new facility will be in the range of approximately 160,000 gross square feet with a footprint of approximately 38,000-45,000 gross square feet.
- **Center for the Arts**—Serving both the needs of USM students and the community, this new facility will be a premier arts venue in Portland. It would include a 1,000-seat theatrical performance hall, 600-seat music theater, black box theater, and fine arts gallery space.

  USM has identified the need for a purpose-built performing arts building for decades. Currently, Theatre and Music perform on campus in small halls in retrofitted historical buildings with seating for no more than 182 audience members. Large ensembles and choral groups use off campus venues such as Gorham High School, Merrill Auditorium or churches in Portland for their concerts. USM also lacks a hall with an orchestra pit and lacks a theatre that has access to industry-standard technology. Creating a Center for the Arts in Portland will create the first ever purpose-built facility for the arts at USM. This will raise the profile of the arts at USM while providing a medium-sized performance center that is also needed by the greater Portland community. This Center for the Arts will not only showcase the work of USM's students, but will create a space for artistic collaboration in Portland.
- **Transportation**—The building plans for the Portland campus will affect parking, displacing current parking spaces, while creating new demands. The master plan accommodates 1,000 spaces, 600 displaced and 400 net new. It is anticipated that Metro passes for all students and employees will also help to address parking issues. To minimize the investment in parking supply, the system should be studied at each phase of the project, with a goal to encourage public, non auto centric transportation.

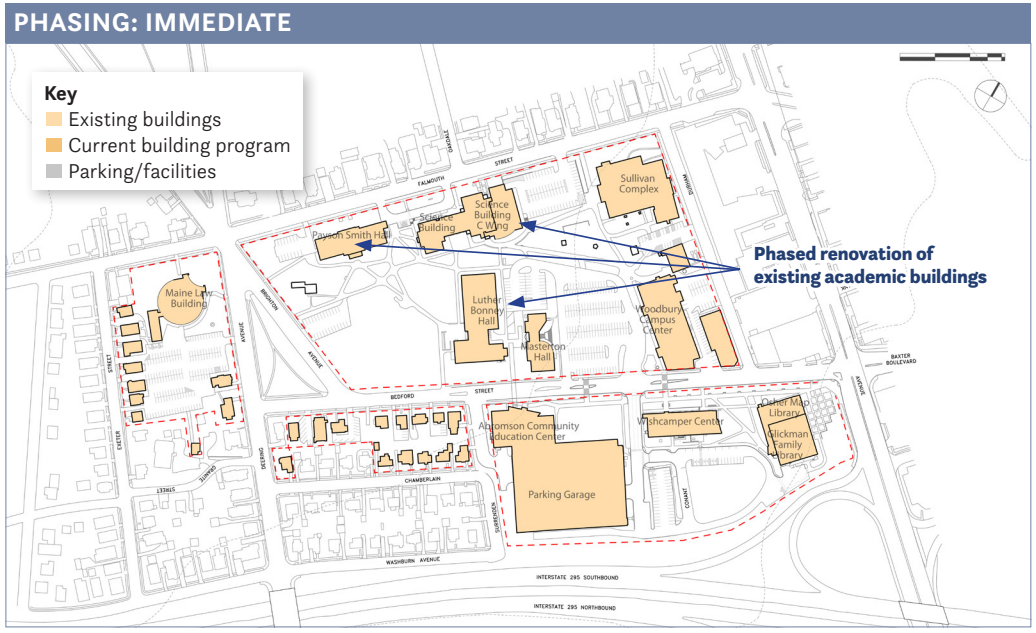
Long-Range

The plan looks to accommodate additional development that can become sites for a variety of uses, including housing, academics, and improvements to fitness and wellness by redeveloping Sullivan.

PHASING: THE CAMPUS TODAY



PHASING: IMMEDIATE



MASTER PLAN RECOMMENDATIONS

To accomplish the vision and transform the Portland campus, the master plan creates a new campus quad and identifies sites for the new large projects. The new campus quad will serve as the new campus heart, surrounded by a new residence hall and Career and Student Success Center.

Components of the plan:

- Building the new campus heart will need to be executed in phases. The first phase is to construct the Career and Student Success Center (CSSC). After looking at several alternative locations for the Center there was only one location that would be immediately available and centrally located on the campus. The selected location for the CSSC is in between the existing surface parking lot and the parking lot between the Sullivan Complex and Wing C of the Science building. Building on this site will help frame and create the new central quad; it will be visible from Bedford Street and can be connected to the Sullivan Complex.

  The second phase is to demolish the Woodbury Campus Center and make the site available for student housing. The plan recommends a 4-story building to accommodate 300 beds. The type and mix of units will be constructed to serve upper class undergraduates and graduate students. To capitalize on its location adjacent to the new quadrangle, the ground floor will be used to accommodate programs open to the whole campus community. In doing so, it will help activate and engage the new campus quad.

  The last step in completing the new campus heart is to construct the new quadrangle. This will require the relocation of the surface parking lot. The quad is seen as a place designed to accommodate a variety of programs, from special events like graduation to a place to congregate, relax or study between classes.

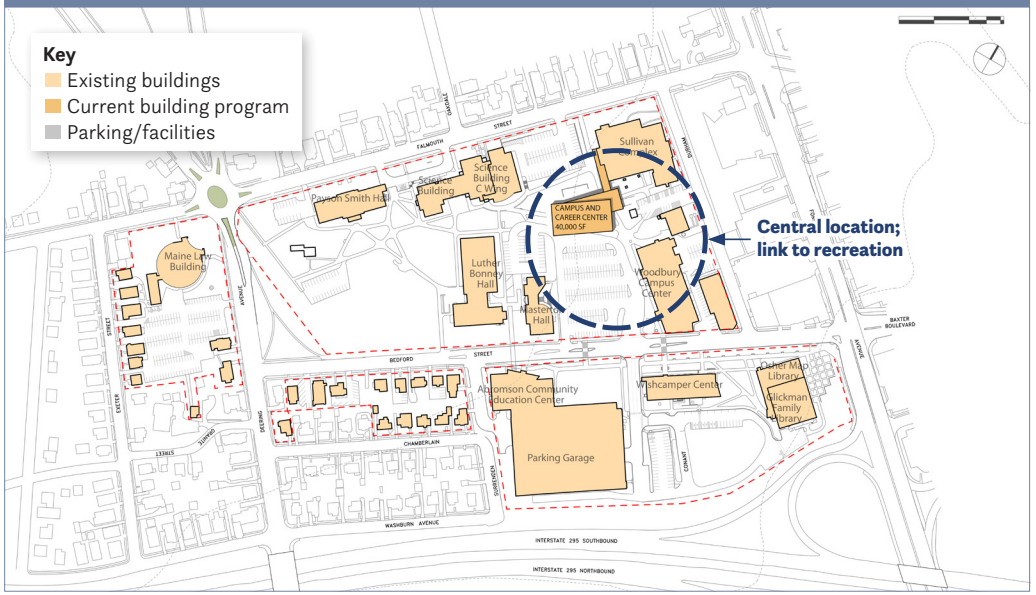
- The Center for the Arts will offer theater and fine arts gallery space, serving USM's Arts, Music and Theater programs, as well as community needs. After careful consideration of different

sites, the parking lot behind Wishcamper was selected as the best location for the Center.

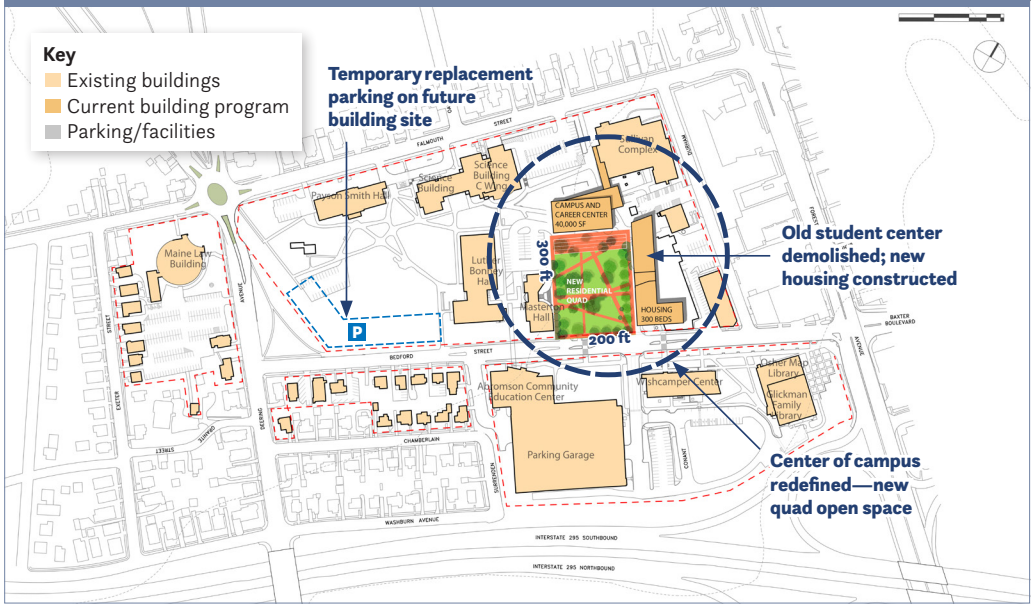
Key attributes of this site include highway visibility, adjacent parking and a campus edge location. The visibility from 295 of a stunningly designed building would provide USM an opportunity to enhance its image in the City and region and support its world-class music program. Given that the peak use of the Center will be primarily during off peak class times, the adjacent parking garage would provide a convenient location for patrons to park and attend events.

- The Graduate Center for Professional Studies will provide a single integrated space for the Law School, a new MBA program offered by the University of Maine, and USM's Muskie School of Public Service. Key attributes of a site for this building are visibility, immediate availability and ability to accommodate the estimated 160,000 GSF building. The preferred site for the Graduate Center is at the current Brighton Avenue Extension, which will be closed and given to USM once the City of Portland completes its roundabout project at the intersection of Brighton, Deering and Falmouth streets. This site's prominent location will help to further define the existing campus open space.
- After the development of the Graduate Center, the Law building can be demolished. The removal of the Law Building will open this site in the near term for additional surface parking and, in the long term, provide a site for future underdetermined campus uses.
- Additional sites were identified during the process that are not immediately needed for campus development. The sites are illustrated on figure x. Some of the sites are immediately available and could be used to accommodate student housing. The other sites will require some enabling projects to make them available for development. In total the plan identifies an additional 400,000 GSF of development potential above what is in the near-term program.
- Continued capital renewal of existing buildings will be addressed throughout all phases of the plan. During the replacement of aging

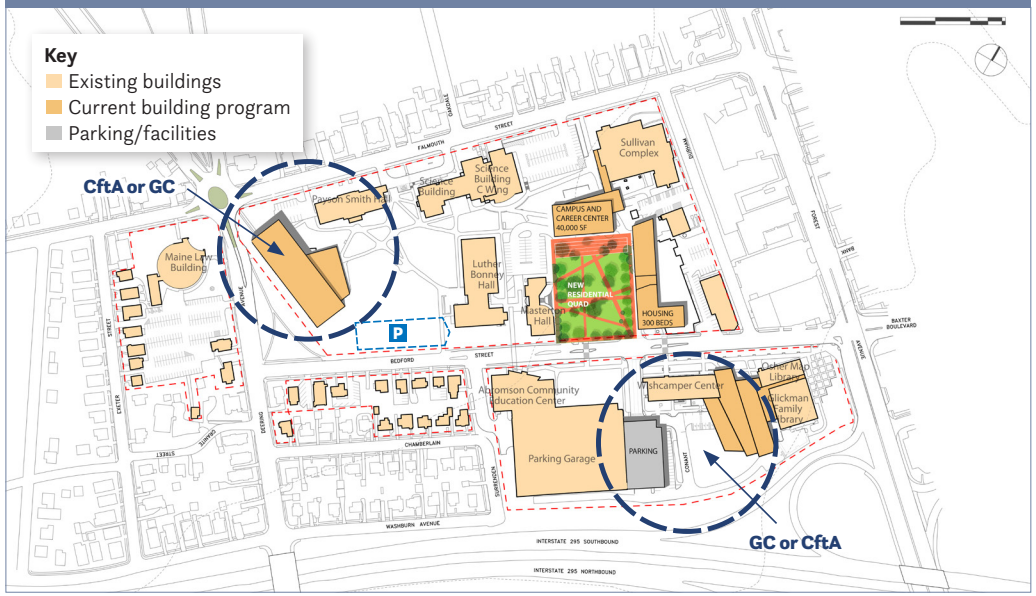
PHASING: SHORT-TERM—CAMPUS AND CAREER CENTER



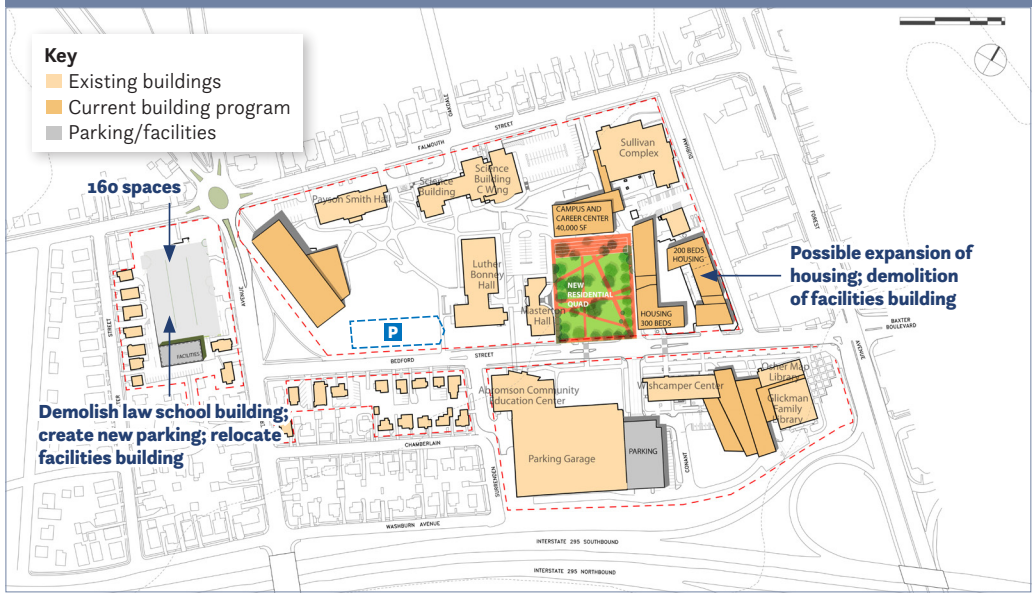
PHASING: SHORT-TERM—RESIDENTIAL AND QUAD



PHASING: SHORT-TERM—GRADUATE CENTER AND CENTER FOR THE ARTS



PHASING: PARKING AND ADDITIONAL HOUSING



infrastructure, these efforts should seek to efficiently add space to the campus. This can be accomplished by careful repurposing and reconfiguring spaces during the design and planning of the capital renewal projects. The existing capital renewal program will determine the priority of the buildings and spaces renovated throughout all phases of the plan.

The master plan recommendations do not violate any current restrictions in the City of Portland's overlay zone; however, they are seen as the basis to continue discussion with the City of Portland to update and create an institutional overlay district.

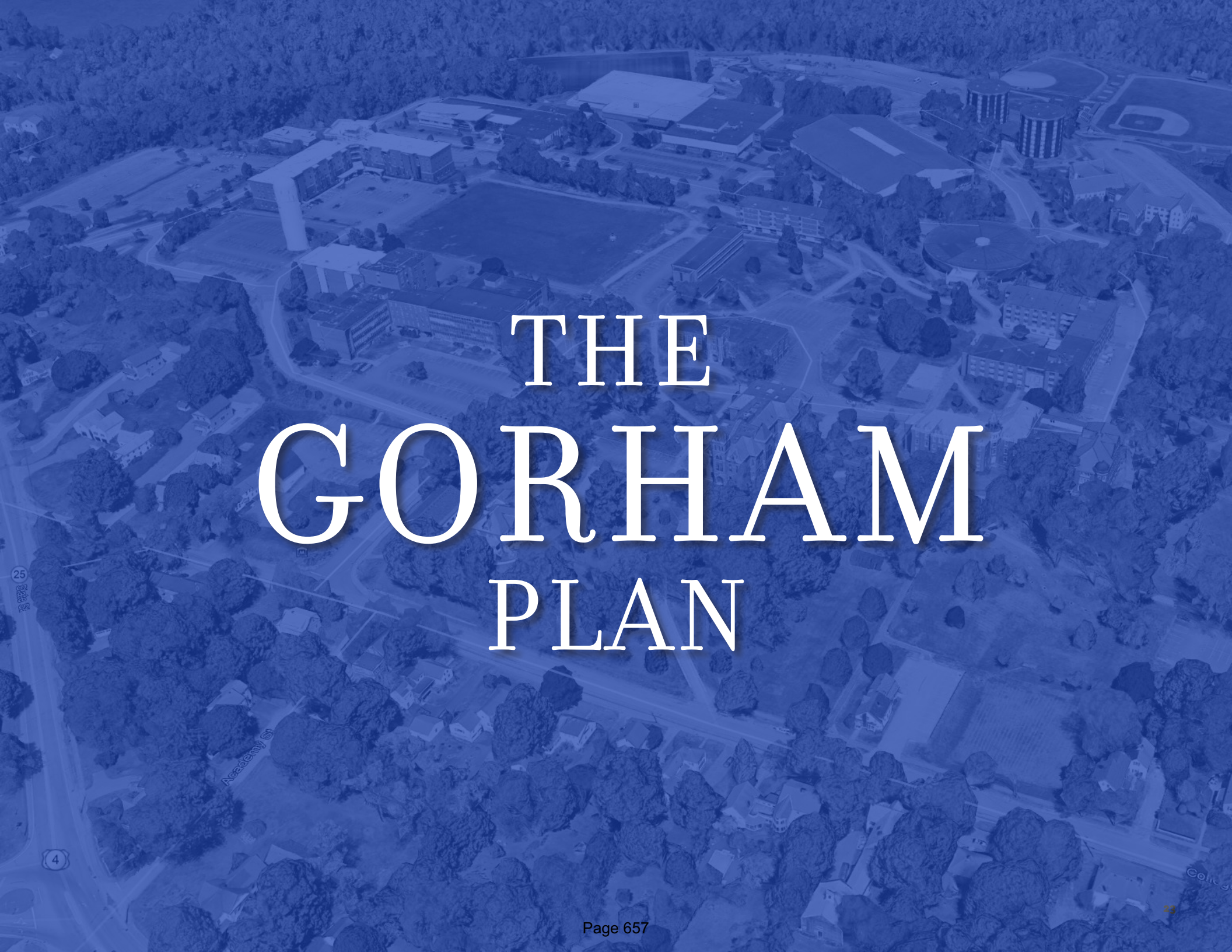
PHASING: SHORT-TERM—COMPLETION OF CORE ELEMENTS



PHASING: LONGER-RANGE—10 YEARS+



400,000 GSF | *Site available for academic, housing, parking or athletic growth beyond current program*



THE GORHAM PLAN

Introduction

The USM Gorham campus has the second largest enrollment of the three campuses with a fall 2017 headcount of 2,570. It is currently the only campus with residence halls, serving approximately 1,200 students.

Encompassing approximately 96 acres at the west edge of the Town of Gorham, the Gorham campus provides the quintessential New England college experience. It is linked to the Portland campus and the City of Portland via frequent bus service and has convenient access from the regional roadway network. State Street is the primary campus gateway, with a second arrival point off School Street. Neither of the locations provides a consistent and positive first image of the campus.

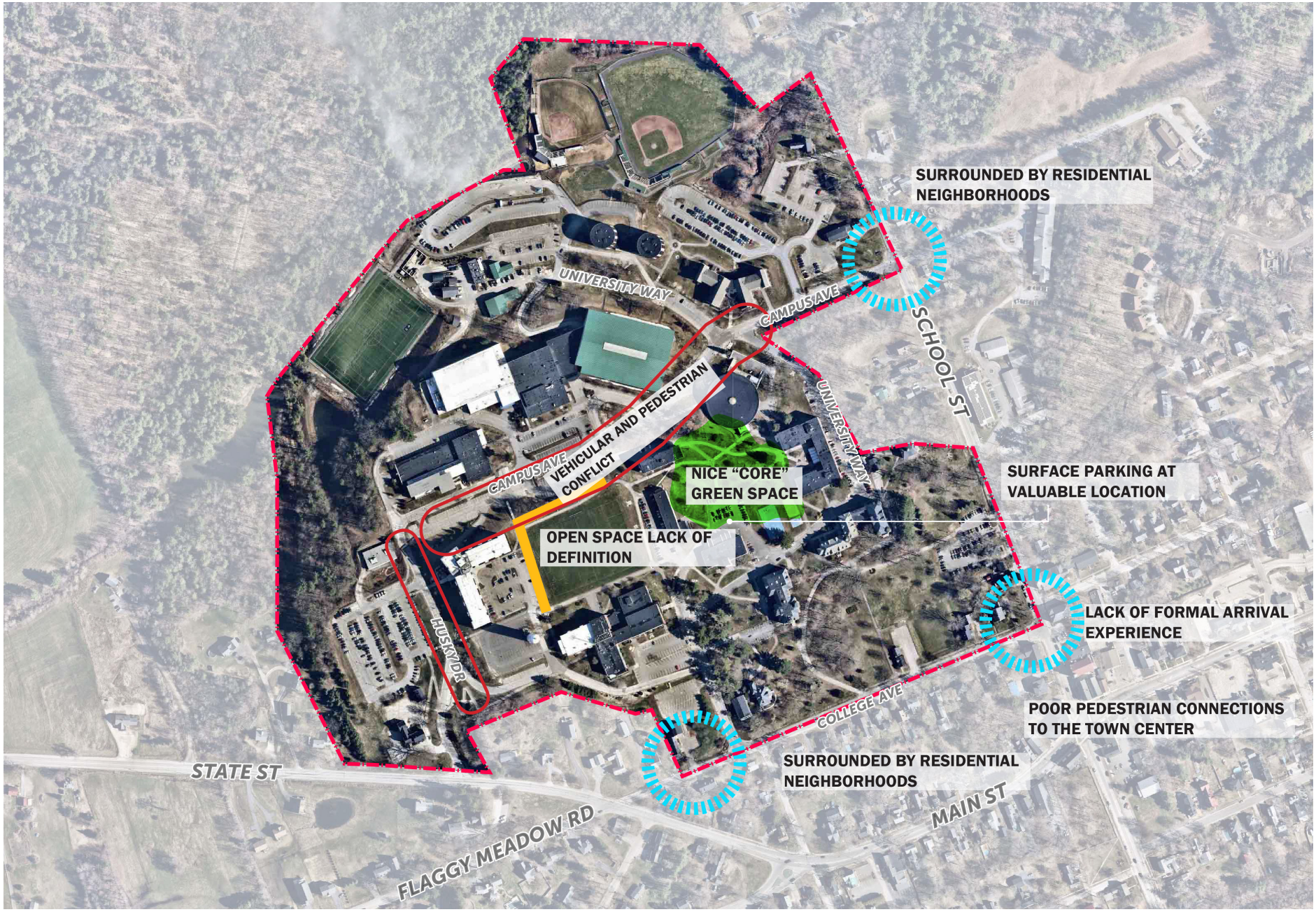


There are 36 buildings comprising 641,997 assignable square feet (ASF). The ASF, excluding residential and unclassified space, is 442,905 ASF. This reflects the core campus space including classroom, laboratory, office, library, special and general use, health care, and central facilities. Dickie-Woods was excluded from this study as it is slated for demolition.

At the top of a ridge, the topography makes it difficult to get views into the campus from the Town of Gorham. It also makes direct pedestrian connection to the town center difficult. The adjacent land uses are predominately single-family residential homes and retail uses along Main and School Street. The western edge of the campus is defined by Tannery Brook.

The campus open space character is inconsistent in quality and design, with the campus pedestrian experience dominated by roadways built to serve numerous parking lots.

There is great potential for the Gorham campus by renewing the campus historic campus landscape. With historic Victorian educational architecture, NCAA athletic venues, and residential halls all located on a wooded hilltop, there are great opportunities to develop a strong campus framework that can have a considerable impact upon student life and success.


SURROUNDED BY RESIDENTIAL NEIGHBORHOODS
UNIVERSITY WAY
CAMPUS AVE
SCHOOL ST
VEHICULAR AND PEDESTRIAN CONFLICT
CAMPUS AVE
UNIVERSITY WAY
NICE "CORE" GREEN SPACE
SURFACE PARKING AT VALUABLE LOCATION
OPEN SPACE LACK OF DEFINITION
HUSKY DR
LACK OF FORMAL ARRIVAL EXPERIENCE
COLLEGE AVE
POOR PEDESTRIAN CONNECTIONS TO THE TOWN CENTER
STATE ST
SURROUNDED BY RESIDENTIAL NEIGHBORHOODS
MAIN ST
FLAGGY MEADOW RD

The Gorham Plan

The following sections describe the master plan recommendations for the Gorham campus.

VISION

The vision for the Gorham campus is grounded in today while being aspirational toward the future.

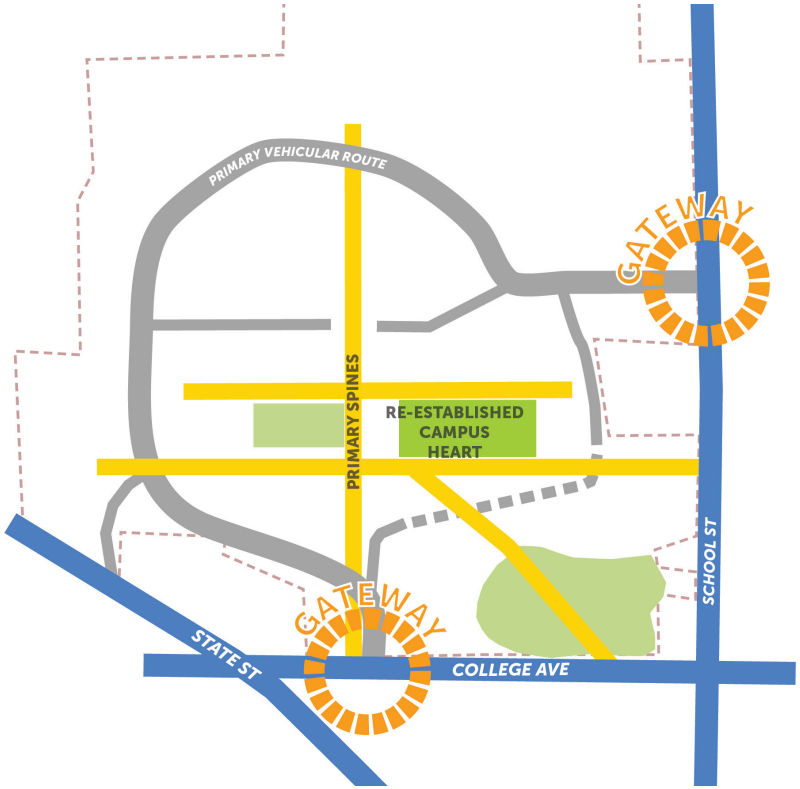
> "To sustainably strengthen an iconic campus focused upon the academic experience with an emphasis on campus life."

SUSTAINABILITY

USM's carbon neutrality goal for Second Nature's Presidents' Carbon Commitment also applies to the Gorham campus. The Campus Sustainability Strategic Plan aims for a 35% reduction in heat and electricity related emissions in existing buildings by the year 2025, as an interim target toward total neutrality by 2040. In order to achieve 35% reductions, significant investment in deferred maintenance is necessary to increase the energy efficiency of older buildings. Such an investment is also necessary to increase the comfort and quality of the spaces students use for learning, studying, eating, and sleeping. True sustainability addresses social, economic, and environmental dimensions of a University, and investing in deferred maintenance is a critical component of all three. To accomplish this, the Committee recommends allocating capital funds toward the Gorham campus' building stock, and additionally using an Energy Savings Performance Contract (ESPC) through an Energy Services Company (ESCO) to leverage private investment. In addition to building energy use, we also strive to increase access to sustainable transportation, reduce material resource waste, and increase hands-on student projects to benefit the Gorham campus.

MASTER PLAN FRAMEWORK

The Gorham campus plan is built upon reestablishing a campus heart, providing a clear pedestrian circulation framework supported by vehicular circulation that does not dominate the campus landscape. The plan, which reestablishes the campus green and connects it to the larger campus and the Town of Gorham, also provides a flexible and bold framework for future development.



DEVELOPMENT PROGRAM

The Gorham development program continues and expands USM's capital renewal program with a focus on the campus life facilities. The program has been categorized into time periods in which the program requirements need to be developed.

Immediate (Now)

- **Continuing Capital Renewal**—This will be a continuation of the program the University has been managing over the past several years in which buildings and spaces in critical deferred maintenance are addressed.

Short-Term (3-5 years)

- **Student Quad Renewal Phase One**—This project relocates the surface parking lot behind Russell Hall and closes University way to emergency and service vehicles only. As part of this project, Dickie-Wood will be demolished, and a surface parking lot will be built on the site. This additional parking will accommodate the parking removed as part of the Student Quad Renewal project.
- **Brooks Student Center**—A critical component of the success of the Gorham Campus will be the renovation of the Student Center.
- **Welcome Center**—The reuse of an appropriately sized and located space as a welcome center is a Gorham Plan recommendation.
- **New/Renewed Student Housing**—There is significant need for much of the housing supply to be renovated or replaced. The occupancy of Spring of 2018 was over capacity. Renovation of housing will require "swing beds" though new development in Portland may be able to accommodate that need.

Long-Range

The plan looks to accommodate additional development in the future that can become sites for a variety of uses, including housing, academic, athletics and fitness.

PROGRAM ELEMENTS

Immediate

- Continuing Capital Renewal

Short-Term

- Student Quad Renewal Phase One
- Brooks Student Center
- Welcome Center
- New/Renewed Student Housing

Long-Range

- Housing
- Academic
- Athletic/Fitness

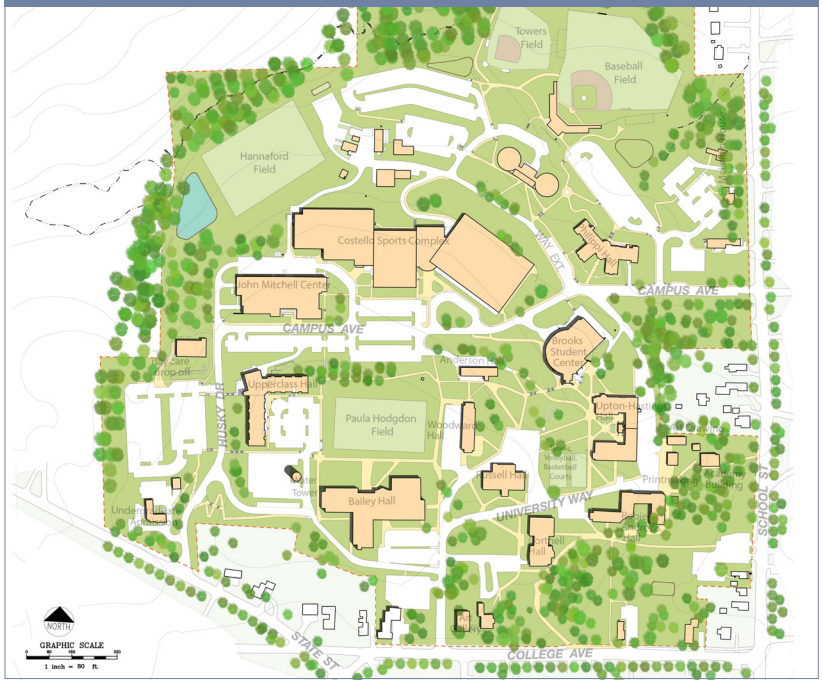
MASTER PLAN RECOMMENDATIONS

To accomplish the vision and create transformational moves that improve the student experience, the master plan recommends renewal of the Gorham campus heart and identifies sites for additional housing and academic sites as they are needed.

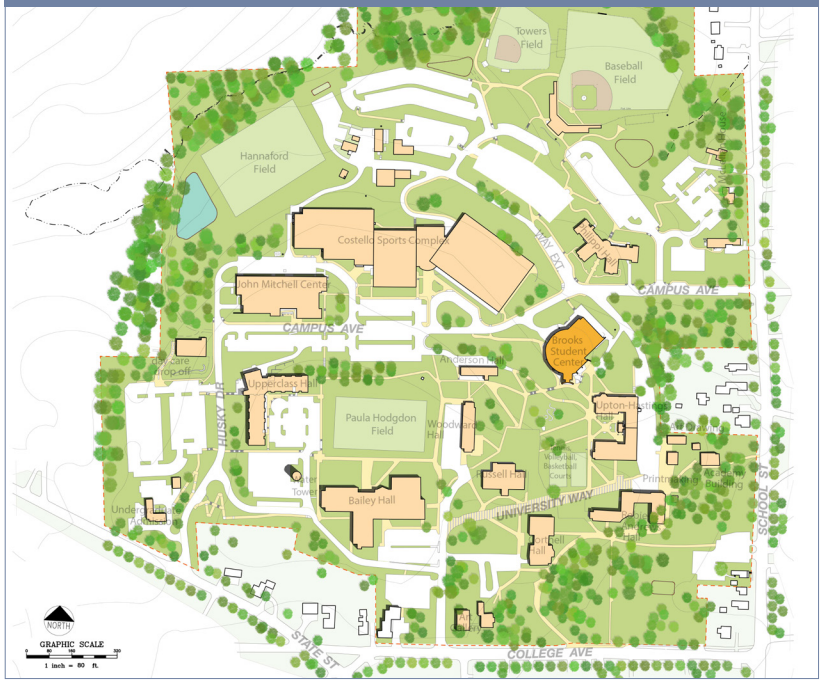
The immediate phase of redevelopment would be to re-establish the campus heart by removing the surface parking behind the Russell Theater and redesigning University Drive to be more pedestrian friendly. In doing so, it will also be less of a barrier between the historic buildings on the crown of the hill. The corridor will continue to accommodate emergency and service vehicles.

The next phase of development at the Gorham Campus is to focus upon the capital renewal of the historic core structures. Russell Hall, Robie-Andrews Hall, and Corthell Hall are all top candidates for investment as funding becomes available. The renovation program started in Bailey Hall should be continued. The renovation of these buildings presents the opportunity through redesign of space to meet some of the office and specialized classroom needs identified in the space needs analysis.

EXISTING CONDITIONS

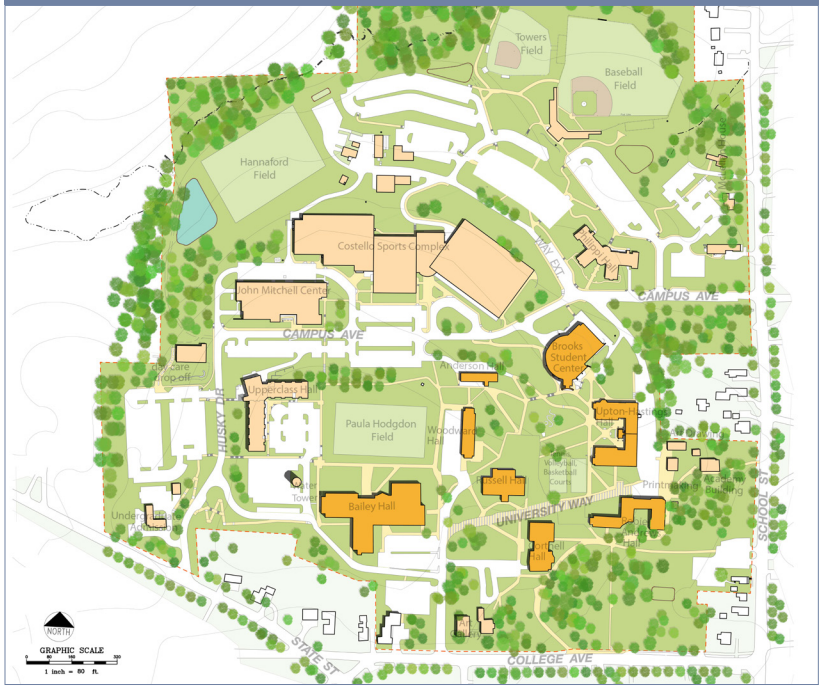


PHASING IMMEDIATE: REESTABLISH A CAMPUS HEART

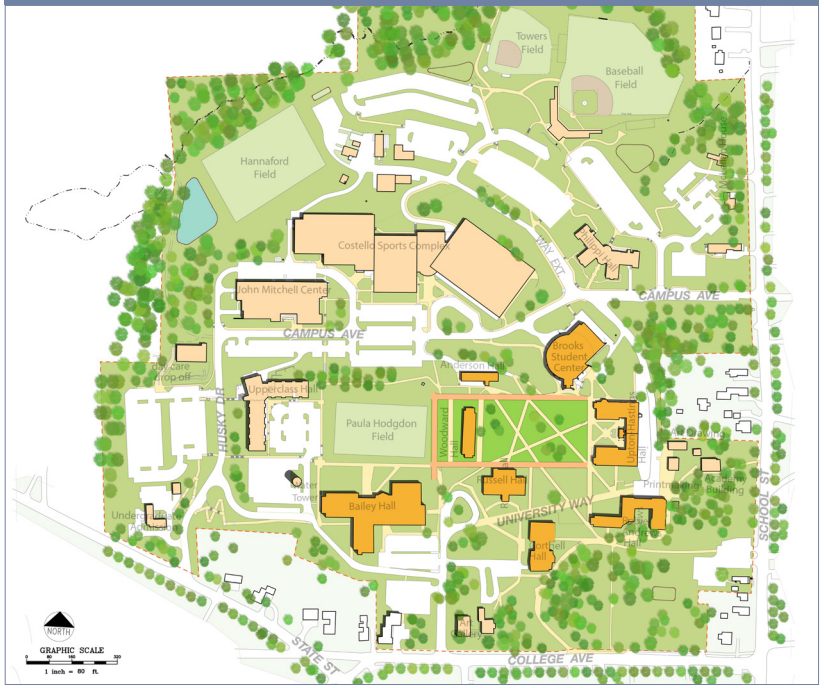



Brooks Student Center
Woodward Hall
Upton-Hastings Hall
Russell Hall
University Way
University Way
Robie-Andrews Hall

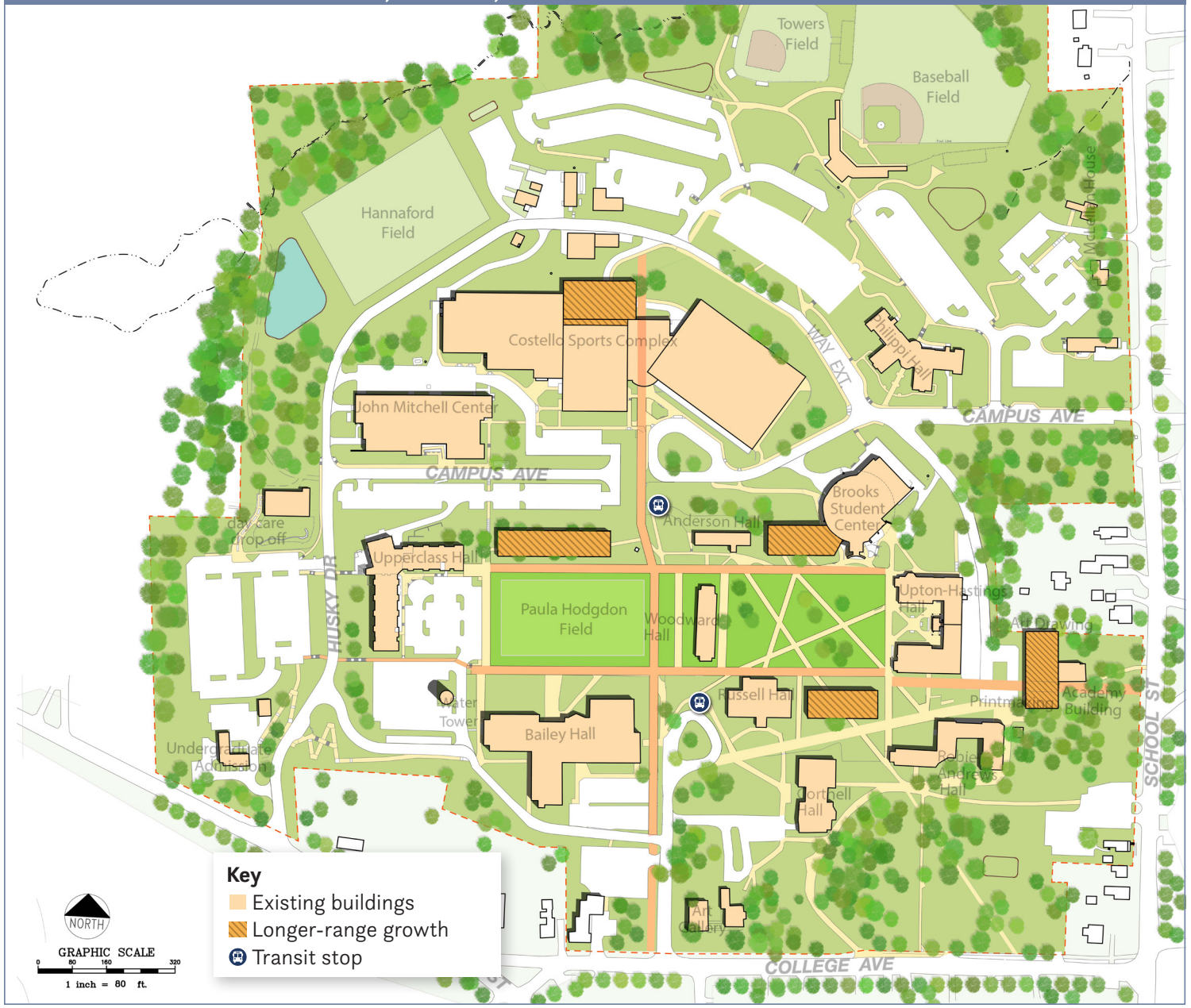
PHASING: IMMEDIATE—ONGOING CAPITAL RENEWAL

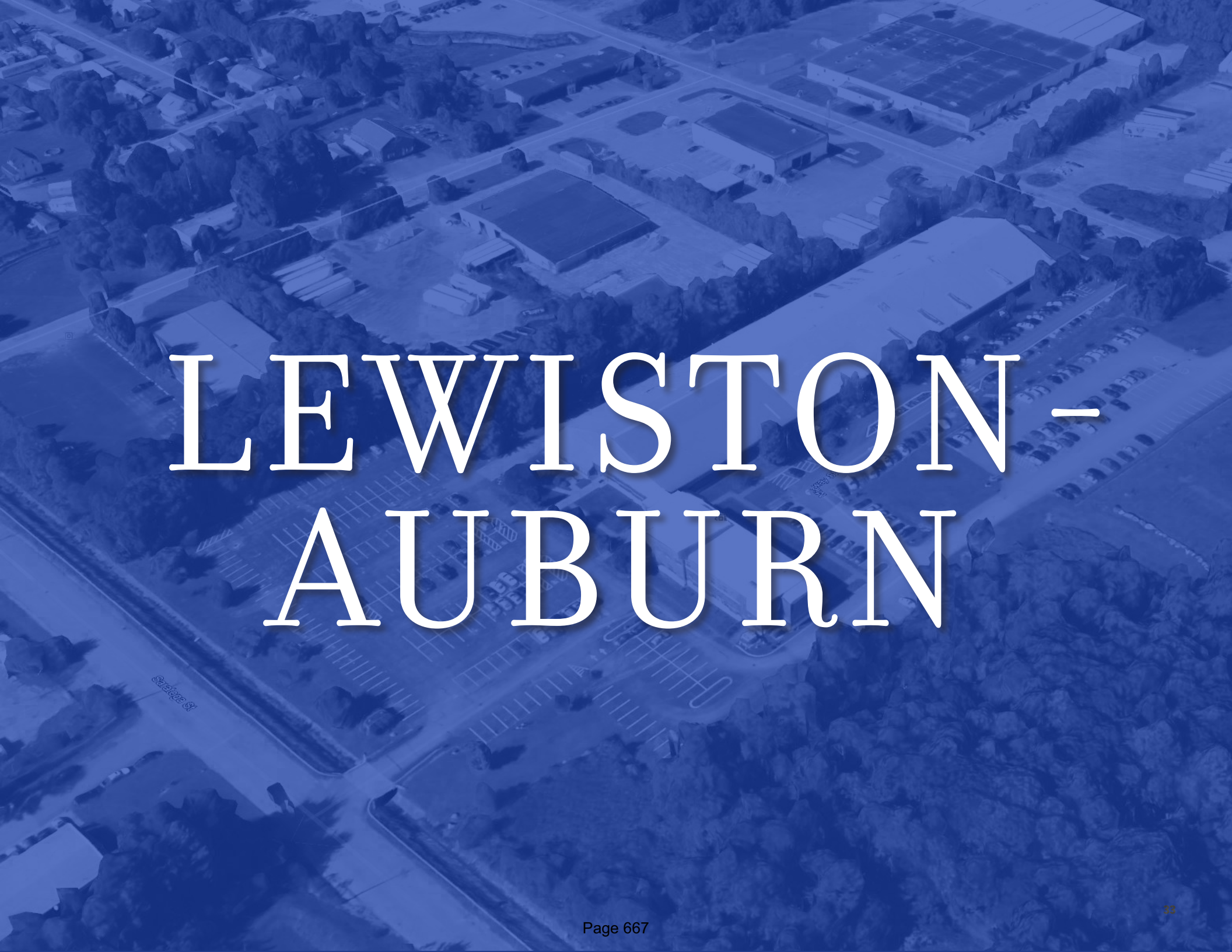


PHASING: SHORT-TERM—CAPITAL RENEWAL CAMPUS LANDSCAPE



PHASING: LONG-RANGE—ACADEMIC, HOUSING, AND ATHLETICS





LEWISTON-AUBURN

Introduction

The Lewiston-Auburn campus has the smallest enrollment of the three campuses with a fall 2017 headcount of 374. The campus encompasses approximately 20 acres and is located at the west edge of the Town of Lewiston. The location and character of the campus is completely determined by its location and development in an industrial park just off the Interstate

There is one campus building comprising 63,531 assignable square feet (ASF). The ASF, excluding unclassified space, is 62,908 ASF. This reflects the core campus space including classroom, laboratory, office, library, special and general use, health care, and central facilities.

Early in the process it was determined the University needed to complete an academic plan for the campus prior to engaging in the facilities master plan process.

APPENDIX

Portland Space Needs Analysis

The space needs analysis for the Portland campus was grounded in institutional strategic drivers of enrollment and personnel, supported by the space inventory, driven by nationally recognized space planning guidelines, and tempered by the specific needs of the University.

PLANNING METHODOLOGY

The outcome of the study is an order-of-magnitude space program organized according to the coding structure of the Facilities Inventory Classification Manual (FICM). A more detailed space needs analysis of instructional space was conducted by the consultant team to inform a finer-grained set of recommendations and is included at the end of this report. Space needs were quantified for Current Calculated, Current Adjusted, and one scenario, Projected Adjusted, using the FTE from the five-year high enrollment. The Current Adjusted, as well as the Projected Adjusted, includes adjustments to the mathematically calculated need. These adjustments are informed by trends in higher education and the interview findings, as well as the culture of the campus, which may not be accounted for in the calculations alone.

INTERVIEWS

From October 18, 2017, through October 30, 2017, the consultant team conducted interviews on the Portland, Gorham and Lewiston-Auburn campuses with senior administrators, faculty members, departmental and unit directors and managers, and administrative and academic staff members. These interviews provided the qualitative data related to the use of and demand for space on the campus; insights into programmatic and spatial relationships between departments; and ideas regarding what facility improvements were needed to meet current and future program and operational requirements.

Overall, the space deficits identified by the interviewees were supported by the quantitative analysis in terms of specialized instructional space, student life/services/club space, meeting and conference space, and athletics space needs, both now and in the future.

The thematic summary of findings is provided at the end of this report.

PORTLAND RECOMMENDATIONS

The space deficit for the campus, identified by FICM, totals 17,800 ASF for Current Adjusted and 61,600 ASF for Projected Adjusted. This finding is based on the proposed enrollment of 3,504.2 FTE, as well as maintaining the currently compressed scheduling window of 29 hours per week. To meet some calculated deficits an optional non-capital suggestion would be to expand the scheduling window from the compressed 29 hours a week, to a more normative 34 hour per week. This would eliminate the need for nine (9) classrooms and approximately 5,000 ASF. These could potentially be repurposed to meet deficits in other space types, such as student study areas. The expanded window would also allow for an opportunity to try new pedagogies and selectively renovate/repurpose low-use rooms.

If the desire is to maintain a compressed scheduling window, an area for more detailed review is the potential availability of the 22,000 ASF of unclassified space, particularly the almost 5,400 of vacant space in the Science B-Wing Basement. While, by the numbers, the ASF could meet select space needs, the existing areas were former animal facilities and may not be able to be re-purposed for teaching laboratory space. As the University continues to implement its Master Plan, care must be taken to critically examine available space and better define, repurpose and refurbish it for more collaborative and efficient use.

The following summarizes the space needs by category and identifies areas that may require specific additional review as the Plan is implemented.

Instructional (100)

At the time of this analysis, there were 44 spaces and 36,294 ASF identified as general-purpose classrooms available for scheduling. There are an additional 23 rooms and 17,833 ASF of classroom space that was dedicated to specific programs. The analysis was conducted on the 44 general-purpose classrooms and 36,294 ASF.

The figure on the following page presents the existing distribution and calculated need for classrooms at both the existing scheduling protocol of 29 hours, as well as applying the 34-hour daytime scheduling window for comparison. For both analyses, the need was calculated based on guidelines of 67 percent average weekly daytime hour utilization and average seat occupancy.

The table aligns the existing distribution of rooms by capacity (seat count) to the need. Using the existing stock of rooms, seat counts, and ASF, a theoretical exercise of "right-sizing" was conducted, which is mathematically calculating the appropriate capacity of the existing rooms.

While right-sizing does not change the total number of classrooms available, it can often bring the distribution of classroom capacities into better alignment with course section sizes. Portland is relatively below target for ASF/seat and so the re-alignment of rooms by capacity could provide some major changes, including providing more 21- to 30-seat classrooms for the campus. By adjusting the current room capacities, the existing rooms can be maintained and meet the necessary space requirement for current enrollment and course offerings. Under the majority of the window calculated and projected scenarios, the needs can be met strategically within the existing footprint of space.

Space Type	Current ASF	Current Adjusted 2,995.8 FTE	Surplus or (Deficit) to Current ASF	Projected Adjusted 3,504.2 FTE	Surplus or (Deficit) to Current ASF
100: Classroom	55,076	55,076	0	55,076	0
210/215: Class Laboratory	28,341	37,493	(9,152)	38,741	(10,400)
220/225: Open Laboratory	15,785	15,785	0	15,785	0
250/255: Research Laboratory	16,140	19,700	(3,560)	19,700	(3,560)
300: Office	144,419	144,419	0	144,419	0
400: Study/Library	66,417	70,984	(4,567)	73,618	(7,201)
500: Special Use, General	2,786	2,786	0	2,786	0
500: Athletics	26,671	26,671	0	26,671	0
600: General Use	42,101	42,101	0	82,101	(40,000)
700: Support*	27,476	27,476	0	27,476	0
800: Health Care	517	1,000	(483)	1,000	(483)
Total	**425,729**	**443,491**	**(17,762)**	**487,373**	**(61,644)**
Other Space (000's)	22,163	22,163	0	22,163	0

** Excludes 372,937 ASF of vehicle parking*

CLASSROOM NEED

CATEGORY	EXIST.	29-HOUR CALC. NEED	29-HOUR PROJ. CALC	34-HOUR CALC. NEED	34-HOUR PROJ. CALC	OPTIMIZE EXISTING SPACE RT.-SIZE EXIST.	OPTIMIZE EXISTING SPACE ADJ.
1 to 20	7	12	11	10	10	6	7
21 to 30	2	8	9	7	8	8	8
31 to 40	8	10	9	8	8	16	18
41 to 50	14	5	6	4	5	8	4
51 to 60	7	2	3	2	2	2	2
61 to 70	2	1	2	2	2	0	1
71 to 80	0	0	0	0	0	0	0
81 to 90	0	0	1	0	1	0	0
91 to 100	1	2	1	1	0	1	1
101+	3	1	2	1	1	3	3
Total	**44**	**41**	**44**	**35**	**37**	**44**	**44**
ASF	36,294	36,190	41,630	31,180	37,080	36,294	36,294
Seats	2,246	1,645	1,910	1,415	1,665	1,872	1,980

Specialized/Research (200/250)

Specialized Instructional

There are 24 spaces and 23,098 ASF assigned to instructional lab space, such as Biology, Art, Nursing, Linguistics, etc. Space needs for specialized instructional space are based on the number of hours by the discipline of the courses, as many courses/programs cannot share space. Where opportunities to continue shared use of the spaces between similar courses were possible, these were maintained. Using the rubrics of 80 percent occupancy, 50 percent utilization, and discipline-specific ASF per station, it is recommended that, beyond maintaining its current complement of SI spaces, Portland add five (5) additional labs, including one (1) Art–Drawing (1,440 ASF), one (1) Art–Studio (1,440 ASF), one (1) Biology–Anatomy and Physiology (1,440 ASF), one (1) Chemistry–General (1,440 ASF), and one (1) Nursing –Fundamentals Lab (1,280 ASF). The 29-hour and 34-hour windows show similar incremental need with the difference that the 34-hour window would eliminate the short-term need for an additional Art–Drawing lab, and the projected need for an additional multipurpose computer lab.

Research

There is a continued desire for this type of student/faculty engagement space on campuses throughout academia. Currently, Portland has 16,140 ASF of faculty research space. The calculated need for Portland is for 19,700 ASF that is then held for the Adjusted need to provide room for future expansion.

INCREMENTAL SI NEEDS

Discipline	29-Hour + Rooms	29-Hour + ASF	34-Hour + Rooms	34-Hour + ASF
INCREMENTAL CURRENT SI NEED (2,995.8 FTE)				
Art–Drawing	1	1,440	0	0
Art–Studio	1	1,440	1	1,440
Biology–Anatomy and Physiology	1	1,440	1	1,440
Chemistry–General	1	1,440	1	1,440
Nursing–Fundamentals	1	1,280	1	1,280
Total	**5**	**7,040**	**4**	**5,600**
INCREMENTAL PROJECTED SI NEED (3,504.2 FTE)				
Art–Drawing			1	1,440
Computer Lab–Multipurpose	1	960	0	0
Total	**1**	**960**	**1**	**1,440**
Grand Total–Current & Projected	**6**	**8,000**	**5**	**7,040**

Qualitative issues need to be identified and addressed.

Office (300)

Portland has 679.5 FTE (723 headcounts) faculty/staff on campus, housed within 144,419 ASF of office and associated support space. Office space ranges from a 30 ASF Political Science office in Payson Smith to a 3,669 ASF office in the Science building used by the Maine Cyber Security Cluster, with an overall average of 143 ASF across faculty, staff, and administrative spaces. The application of appropriate planning multipliers and assumptions that the spaces are properly outfitted and usable, result in the need for 133,000 ASF.

Those spaces that are less than 90 ASF should be reviewed for appropriateness in terms of assignment and use. As the campus moves forward with the master plan, putting office guidelines into effect should be considered to begin standardizing the size of offices across the campus.

Library/Study (400)

The library and study space category encompass almost 66,500 ASF and has an overall space needs deficit of about 4,500 ASF in the study category.

Library space has become the learning commons at many institutions and incorporates coffee bars, some social areas, group study rooms, etc. Portland has undergone numerous renovations that have produced some exemplary learning commons styled facilities.

Special Use (500)

The Special Use FICM space category consists of various space clusters including athletics, field buildings, and greenhouses, among others. These spaces are calculated based on the specialized need for the associated space types.

More often than not, the primary driver for campuses in this category is Athletics/Recreation space, which is the case for Portland. Athletics/Recreation encompasses 26,600 ASF located in Sullivan Gym. The base calculated ASF for athletics at a four-year institution is 50,000 ASF. Portland and Gorham share athletics resources, and as such the existing ASF between the two campuses meets the needs of the University. The challenge for Portland is Sullivan Gym, the main athletics building, no longer physically supports campus needs. The layout is not conducive to functions housed in the building, and there are concerns that space is subpar for the potential addition of residential life.

Two other space types in this category are Media Production and Greenhouses. The campus has a radio station located in Bedford 92, and some additional media support space located within Glickman Library, while the calculated need is for 5,000 ASF, the current 2,342 ASF appears to meet campus needs. The campus also has a greenhouse located in the top floor of Science A-Wing (444 ASF), while the calculated need exceeds the existing, the current space is underutilized.

General Use (600)

The General Use FICM space category consists of various clusters including assembly, exhibition, food service, and meeting rooms (student-centered services). Some of the highlights of this area:

- **Assembly:** Hannaford Hall, part of the Abromson building, is assigned to this category. 40,000 ASF has been incorporated into the Projected Adjusted for the Fine Arts Center that will serve both the Gorham and Portland communities
- **Dining:** Currently, the main dining service is located within the Woodbury Campus Center. Today's students are looking for more inviting and varied dining experiences, featuring specialty food stations, high top tables, booths, comfortable seating, and connectivity—spaces and furnishings that promote easy interaction. Although the overall ASF for dining has been maintained, location, function, and aesthetics may need to be refreshed.
- **Recreation:** This space type is often found in student centers and consists of game rooms, TV lounges, general fitness rooms, etc.

Sullivan Gym, quantitatively, meets the needs of the campus as a whole.

- **Meeting Rooms:** This type of space is generally available to internal and external groups such as study groups, board meetings, community groups, etc. There are multiple spaces and flexible rooms located throughout the campus that meet the calculated need. The challenge for these spaces is the lack of storage areas for tables, chairs, food, etc.

Central Facilities (700)

Central Facilities (27,476 ASF) support overall campus operations and include mail, receiving, general storage, and shop space, among others. The current ASF meets the overall needs of the campus. It should be noted that the unassigned space on campus is, in part, serving an additional role as storage, which will need to be addressed when the spaces are recaptured.

Health Services (800)

Health Services is currently located in Payson Smith, with an upcoming planned move to Sullivan Gym. 1,000 ASF has been held as a placeholder for the planned relocation ASF.

Residential (900)

There are currently no residential facilities on the Portland campus. Further discussion and planning are needed before calculating the impact of the housing on the overall campus space needs. The addition of housing will also impact a number of other space types on campus, including health services, as indicated above, as well as food service, student activities, and the staff and resources to support these functions.

SUMMARY

With competing needs for scarce funds, it is critical for the university to identify and implement a few key renovation and expansion projects for near-term consideration. These projects, however, should be planned and designed with a campus-wide and long-term perspective

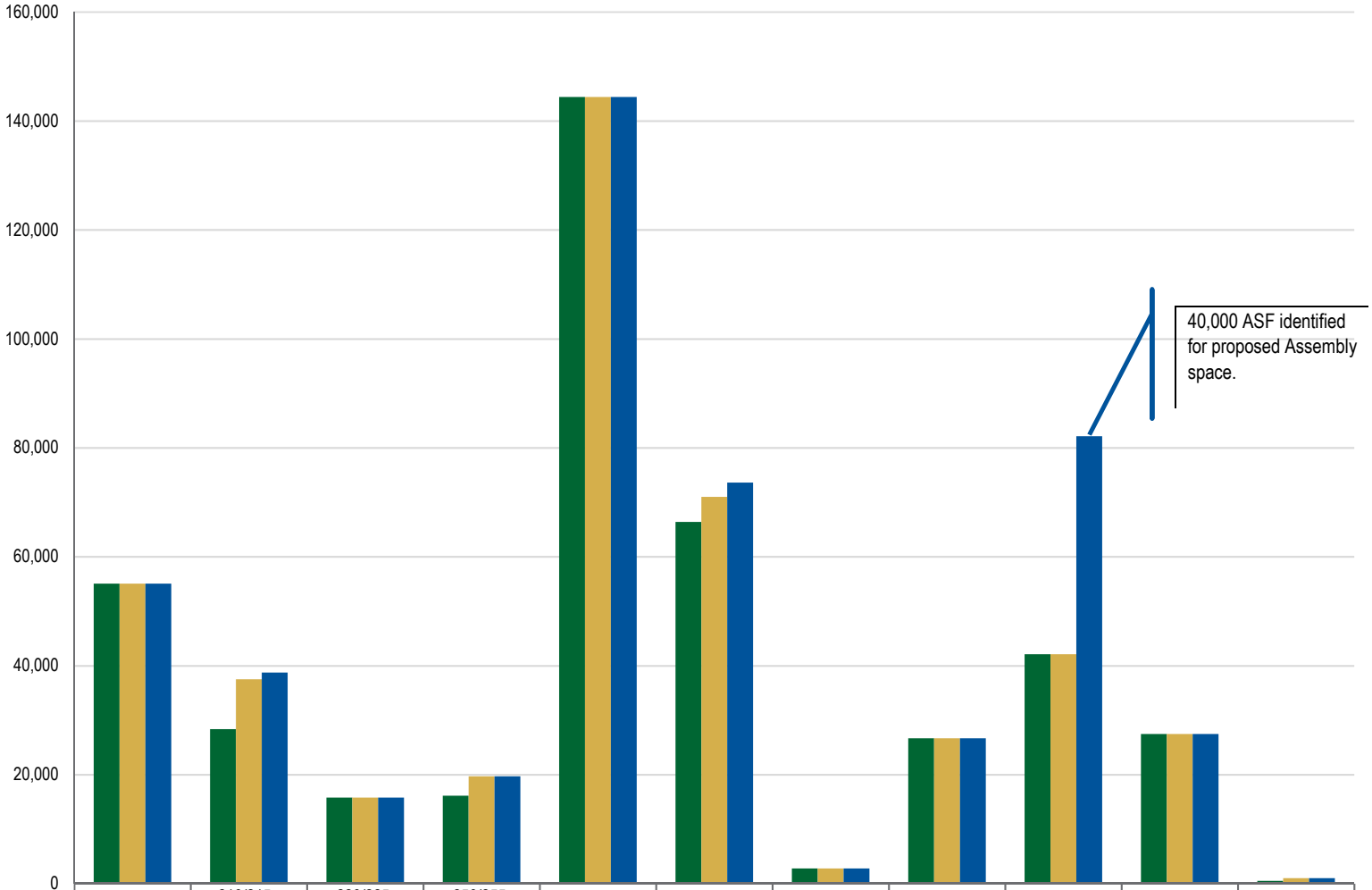
A select group of projects have been identified for capital renewal to set the course. The capital renewal list should includes:

- **Science:** There is currently 5,400 ASF of unassigned space and 2,000 ASF that is unfinished. The unassigned space consists primarily of vacant animal facilities and former space for the sunset Applied Medical Science program. This space will be recapturable to meet the teaching lab needs for the campus.
- **23 Brighton Ave:** This space can be repurposed to support a Welcome Center, swing space, or some other function not yet identified.

Regardless of renovation or new construction, continued thoughtful and purposeful planning is required to make the highest and best use of current facilities. New or renovated spaces should incorporate, where possible, the flexibility needed to accommodate the changes that will inevitably come in the future.

The following graphs summarize space needs by FICM category for Current, Calculated, Current Adjusted, and Projected Adjusted Need, as well as the categories with specific deficits.

SUMMARY OF SPACE NEEDS AND DEFICITS BY CATEGORY



	100: Classroom	210/215: Class Laboratory	220/225: Open Laboratory	250/255: Research Laboratory	300: Office	400: Study / Library	500: Special Use	520/525: Athletics	600: General Use	700: Support	800: Health Care
Current ASF	55,076	28,341	15,785	16,140	144,419	66,417	2,786	26,671	42,101	27,476	517
Current Adjusted	55,076	37,493	15,785	19,700	144,419	70,984	2,786	26,671	42,101	27,476	1,000
Proj. Adjusted 3,504.2 FTE	55,076	38,741	15,785	19,700	144,419	73,618	2,786	26,671	82,101	27,476	1,000

Portland Facilities and Resources

The Portland campus is comprised of 12 principal structures sited on 34 acres. A number of small former residential structures known as the "white houses" have been acquired on the perimeter of the campus. The average age of the primary building stock is 41 years old, half of which are over 50. Building systems have an expected usable life of 20–40 years, beyond which they become inefficient, obsolete or risk failure.

The Portland Plan promotes an overall facility strategy that prioritizes infill and redevelopment in support of a compact and pedestrian-oriented campus. Capital investment should leverage the limited available dollars to address critical building systems and improve the health, safety, function and appearance of existing structures. The Portland Plan suggests priority buildings for investment and identifies buildings that may be better suited to demolition and replacement based on several criteria: do they enhance the character of the campus, are they historically significant, do they require disproportionate investment in deferred maintenance costs, and do they represent the highest, best use of land resources? The following facilities are identified for possible demolition and replacement to make better use of campus land and infrastructure:

- **Woodbury Campus Center** (28,256 SF)
- **Law School Building** (92,824 SF)
- **25 Bedford Street** (9,744 SF)

Facilities Condition

A visual assessment of building facility conditions was conducted as part of the master plan. Buildings and their systems were evaluated on a scale of 0–5. Thirty different building systems were evaluated in eight major categories included the building exterior, interior construction, life safety systems, electrical, lighting, mechanical systems, plumbing, and visible structure.

A resulting building facility condition ranking is based on an average of the individual building system assessments. Buildings are grouped into the following condition categories:

Poor	Fair	Average	Good
0–1.99	2.0–2.99	3.0–3.99	4.0–5.0

This analysis reveals that the majority of the USM facilities are in the average to poor condition. Over half the buildings surveyed (8 out of 15) were in fair or poor condition. Four were in average condition and three were in good condition.

The master plan identifies the following facilities for reinvestment:

- **Luther Bonney Hall** (28,256 SF)
- **Science Buildings A and B**
- **Payson Smith** (52,606 SF)
- **Sullivan Gymnasium** (61,726 SF)

CAMPUS INFRASTRUCTURE

Storm Water

The Portland campus is permitted through the Maine Department of Environmental Protection Agency through the Site Location of Development Act as well as regulated by the Environmental Protection Agency (EPA) under the Phase II Storm Water Rules for a MS4 community. These storm water regulations became effective for the USM campus over the last two decades. As such, any new construction or redevelopment on the campus since the mid-1990's has been designed with formal storm drain collection and storm water quantity and quality control measures, which is recommended for inclusion with all future projects on the campus. All existing sewer systems within the campus appear to have adequate capacity for the extent of development (i.e. percent of impervious area) within each of the existing tributary drainage areas as well as adequate capacity for any potential expansion and development of additional buildings.


Sullivan
2.34
21 Durham
2.81
Central Heating
4.26
25 Bedford
3.30
Science C
3.24
Woodbury
2.27
Science B
2.53
Osher Addition
3.95
Science A
2.16
Luther Bonney
2.44
Glickman Library
2.76
Payson Smith
2.44
Masterton
3.06
Wishcamper
4.00
Abromson
3.63
Law Building
2.23

Domestic Water

The water mains in the streets surrounding the campus are utilized for domestic water, sprinkler systems and fire hydrants. The highest projected continuous draw on the water system at any one time is when it has to meet the design demand for a sprinkler system operation. The water system is capable of the proposed future expansion. Recorded flow hydrant tests indicate over 1,200 gallons per minute flow available with a 40-psi drop from static pressure.

Central Heat Plant

The existing boiler plant consists of two 500 HP boilers and one 150 HP boiler. All boilers are fired on natural gas as the primary fuel source with #2 heating oil as the backup fuel source. The current steam load for the Portland Campus is estimated at 15,100 pounds/hour of steam and can be met by operating one 500 HP boiler. The projected future load for the Portland Campus is estimated at 21,900 pounds/hour of steam which would allow for a net increase of 235,000 square feet of campus growth. This projected future load can be met by operating one 500 HP boiler along with the 150 HP boiler. The configuration of the plant allows for one 500 HP boiler as a backup while still meeting the projected future load.

Primary Power

The campus primary underground electrical distribution system consists of two separate and independent modified radial loop feed systems physically separated by Bedford Street. It is recommended that the northern and southern loops be interconnected to provide redundancy, increase the loop capacity and improve reliability. Based on historical demand growth, the northern radial-loop feed distribution system would have sufficient capacity for future growth. There is minimal space for potential building growth on the southern side of Bedford Street.

Campus Data

The existing fiber plant consists primarily of multi-mode fiber optic cabling between facilities. The Payson Smith Building acts as the central distribution point for the fiber. Most of the campus backbone cabling is installed in conduits with some direct burial cables in the Bedford Avenue and Chamberlain Avenue area. Most of the conduits are 4", equipped with innerduct, with varying space available for future expansion.

SUSTAINABILITY

USM, as a 2007 signatory of the Presidents' Climate Leadership Commitment (formerly the American College and University Presidents' Climate Commitment), is working toward the goal of climate neutrality and resiliency. The commitment requires the University to adopt several actions to reduce emissions of the six greenhouse gases addressed under the Kyoto Protocol, the most significant of which is carbon dioxide (CO_2). The ACUPCC also requires the University to develop a Climate Action Plan, establishing target dates for achieving climate neutrality; identify interim milestones; provide strategies for fulfilling the educational and research including descriptions of current education and research activities related to climate change and sustainability; and set out actions to make climate change and sustainability part of the curriculum. In April of 2017 the Climate Action Plan became part of a broader sustainability plan structured on three content areas:

- **Energy** (energy reduction projects, minimum new construction benchmarks, establish emissions goals)
- **Material Resources** (waste reduction and avoidance, recycling and re-use efforts)
- **Education and Outreach** (marketing, outreach, curriculum, educational and training forums)

Gorham Space Use Analysis

GORHAM RECOMMENDATIONS

The space deficit for the campus, identified by FICM, totals 6,000 ASF for Current Adjusted and 9,000 ASF for Projected Adjusted. This finding is based on the proposed enrollment of 1,502.8 FTE, as well as maintaining the currently compressed scheduling window of 23 hours per week. To meet the calculated deficit is an optional non-capital suggestion to expand the scheduling window from the compressed 23 hours a week, well below the level of a 4-year liberal arts institution, to a more normative 34 hour per week. This would eliminate the need entirely for additional teaching labs and would bring the campus back to alignment with similar institutions related to scheduling windows.

If the desire is to maintain a compressed scheduling window, an area for more detailed review is the potential availability of the 18,000 ASF of unclassified space, particularly the almost 6,000 of vacant space in 62 and 128 School Street. While, by the numbers, the ASF could meet the space needs, the existing areas were designed for office space, and may not be able to be re-purposed for teaching laboratory space.

The following summarizes the space needs by category and identifies areas that may require specific additional review.

Instructional (100)

At the time of this analysis, there were 18 spaces and 17,140 ASF identified as general-purpose classrooms available for scheduling. There are an additional 19 rooms and 15,720 ASF of classroom

Space Type	Current ASF	Current Adjusted 1,250.8 FTE	Surplus or (Deficit) to Current ASF	Projected Adjusted 1,502.8 FTE	Surplus or (Deficit) to Current ASF
100: Classroom	36,464	36,464	0	36,464	0
210/215: Class Laboratory	38,995	45,027	0 to (6,032)	48,147	0 to (9,152)
220/225: Open Laboratory	26,350	26,350	0	26,350	0
250/255: Research Laboratory	11,632	11,632	0	11,632	0
300: Office	77,804	77,804	0	77,804	0
400: Study/Library	22,345	22,345	0	22,345	0
500: Special Use, General	161	161	0	161	0
500: Athletics	123,201	123,201	0	123,201	0
600: General Use	72,270	72,270	0	72,270	0
700: Support	32,562	32,562	0	32,562	0
800: Health Care	1,121	1,121	0	1,121	0
Subtotal	**442,905**	**448,937**	**0 to (6,032)**	**452,057**	**0 to (9,152)**
900: Residential	180,921	180,921	0	180,921	0
Total 100 to 900	**623,826**	**629,858**		**632,978**	
Other Space (000's)	18,171	18,171	0	18,171	18,171

CLASSROOM NEED

CATEGORY	EXIST.	29-HOUR CALC. NEED	29-HOUR PROJ. CALC	34-HOUR CALC. NEED	34-HOUR PROJ. CALC	OPTIMIZE EXISTING SPACE RT.-SIZE EXIST.	OPTIMIZE EXISTING SPACE ADJ.
1 to 20	1	3	4	2	2	0	1
21 to 30	1	6	5	4	3	3	6
31 to 40	5	5	5	3	4	7	5
41 to 50	7	1	1	0	1	7	4
51 to 60	3	1	1	1	0	0	1
61 to 70	0	0	1	0	1	0	0
101+	1	1	1	1	1	1	1
Total	**18**	**17**	**18**	**11**	**12**	**18**	**18**
ASF	17,140	15,070	16,220	10,210	11,520	17,140	17,140
Seats	918	675	735	465	535	850	832

INCREMENTAL SI NEEDS

DISCIPLINE	29-HOUR + ROOMS	29-HOUR + ASF	34-HOUR + ROOMS	34-HOUR + ASF
INCREMENTAL CURRENT SI NEED (1,250.8 FTE)				
Computer Lab–Digital Arts	1	800	0	0
Computer Lab–Engineering	1	960	0	0
Music–Performance	1	1,440	0	0
Sports Medicine	1	1,440	0	0
Total	**4**	**4,650**	**0**	**0**
INCREMENTAL PROJECTED SI NEED (1,502.8 FTE)				
Art–Photography	1	960	0	0
Art–Sculpture	1	960	0	0
Art–Studio	1	960	0	0
Total	**3**	**2,880**	**0**	**0**
Grand Total–Current & Projected	**7**	**7,520**	**0**	**0**

Qualitative issues need to be identified and addressed.

space that was dedicated to specific programs. The analysis was conducted on the 18 general-purpose classrooms and 17,140 ASF. The figure below presents the existing distribution and calculated need for classrooms at both the existing scheduling protocol of 23 hours, as well as applying the 34-hour daytime scheduling window for comparison. For both analyses, the need was calculated based on guidelines of 67 percent average weekly daytime hour utilization and average seat occupancy.

The table aligns the existing distribution of rooms by capacity (seat count) to the need. Using the existing stock of rooms, seat counts, and ASF, a theoretical exercise of "right-sizing" was conducted, which is mathematically calculating the appropriate capacity of the existing rooms. While right-sizing does not change the total number of classrooms available, it can often bring the distribution of classroom capacities into better alignment with course section sizes. Gorham is relatively below target for ASF/seat and so the re-alignment of rooms by capacity could provide some major changes, including providing more 21- to 30-seat classrooms for the campus. By modifying the current room capacities, the existing rooms can be maintained and meet the necessary space requirement for current enrollment and course offerings.

Specialized/Research (200/250)

Specialized Instructional

There are 26 spaces and 32,733 ASF assigned to instructional lab space, such as Music, Theatre, Engineering, Sports Medicine, Art, etc. Space needs for specialized instructional space are based on the number of hours by the discipline of the courses as many courses/programs cannot share space. Where opportunities to continue shared use of the spaces between similar courses were possible, these were maintained. Using the rubrics of 80 percent occupancy, 50 percent utilization, and discipline-specific ASF per station there is a calculated need for up to four (4) additional labs, including one (1) Computer Lab–Digital Arts (800 ASF), one (1) Computer Lab–Engineering (960 ASF), one (1) Music–Performance, and one (1) Sports Medicine (1,440 ASF).

Utilizing the full 34-hour official scheduling window would eliminate any quantitative need for additional teaching labs both currently and in the future based on enrollment goals.

Research

There is a continued desire for this type of student/faculty engagement space on campuses throughout academia. Currently, USM-G has 11,632 ASF of faculty research space. The current ASF meets the needs of the campus as a whole and has been held for the Adjusted need, although, per the interviews, individual rooms should be renovated.

Office (300)

Gorham has 305 FTE (320 headcounts) faculty/staff on campus, housed within 77,804 ASF of office and associated support space. Office space ranges from two 43 ASF offices, one in Corthell Hall, and one in Anderson Hall, to a 1,616 ASF History office in Bailey Hall, with an overall average of 166 ASF across faculty, staff, and administrative spaces. The application of appropriate planning multipliers and assumptions that the spaces are properly outfitted and usable result in no need for additional space.

Those spaces that are less than 90 ASF should be reviewed for appropriateness in terms of assignment and use. As the campus moves forward with the master plan, putting office guidelines into effect should be considered to begin standardizing the size of offices across the campus. It is acknowledged, however, that the Gorham campus is comprised of historical buildings that significantly impact eh ability to apply these metrics.

Library/Study (400)

The library and study space category encompass almost 22,400 ASF and meets the needs of the campus, overall.

Library space has become the learning commons at many institutions and incorporates coffee bars, some social areas, group study rooms, etc. Gorham is undergoing numerous updates to provide a more learning commons centric library space.

Special Use (500)

The Special Use FICM space category consists of various space clusters including athletics, field buildings, greenhouses, among others. These spaces are calculated based on the specialized need for the associated space types. More often than not, the primary driver for campuses in this category is Athletics/Recreation space, which is the case for Gorham, but not in a quantitative manner. Athletics encompasses 123,201 ASF disaggregated between the Field House (62,467 ASF), Warren Hill Gymnasium (27,916 ASF), Ice Arena (25,955 ASF), and the Baseball Stadium (6,863 ASF). The base calculated ASF for athletics at a four-year institution is 50,000 ASF. The challenge for Gorham is that the athletics department feels that it is outgrowing its current space, and there were multiple suggestions to expand their offerings, particularly to add a swimming pool to the campus.

Another space type in this category is the greenhouse. Currently, the campus has a small greenhouse located in Bailey Hall (161 ASF). While the calculated need equates to more than the existing ASF, Gorham has recently renovated the existing area, and have no programmatic plans that would call for additional ASF.

General Use (600)

The General Use FICM space category consists of various clusters including assembly, exhibition, food service, and meeting rooms (student-centered services). Some of the highlights of this area: Assembly: Russell Auditorium is the main space assigned to this category. The ASF is appropriate for a campus of this size and will support a minimal uptick in enrollment.

- **Dining:** Currently, the main dining service is located in the Brooks Student Center. Today's students are looking for more inviting and varied dining experiences, featuring specialty food stations, high top tables, booths, comfortable seating, and connectivity—spaces

and furnishings that promote easy interaction. Although the overall ASF for dining has been maintained, location, function, and aesthetics may need to be refreshed.

- **Recreation:** This space type is often found in student centers and consists of game rooms, TV lounges, general fitness rooms, etc. This type of space, with the exception of the fitness aspect, is generally missing on campus; however, it is presumed that the athletics facilities (collectively referred to as the Costello Sports Complex) fulfill a majority of the student needs.
- **Meeting Rooms:** This type of space is generally available to internal and external groups such as study groups, board meetings, community groups, etc. There are multiple spaces and flexible rooms located throughout the campus that exceed the calculated need. The challenge for these spaces is the overall quality, lack of storage areas for tables, chairs, etc.

Central Facilities (700)

Central Facilities (32,562 ASF) support overall campus operations and include mail, receiving, general storage, and shop space, among others. The current ASF meets the overall needs of the campus. It should be noted that the unassigned space on campus is, in part, serving an additional role as storage, which will need to be addressed when the spaces are recaptured.

Health Services (800)

Health Services is currently located in Upton-Hastings Hall. Space has been held constant as it meets the needs of the campus, and there are nearby medical services.

Residential (900)

Gorham has eight residential buildings on campus: Anderson Hall, Philippi Hall, President's House, Robie-Andrews Hall, Upperclass Hall, Upton-Hastings Hall, and Woodward Hall. The on-campus residences are in need of upgrading. The campus has also planned the demolition of Dickie-Woods Hall for this year, and it is currently experiencing a shortage in available dormitory space.

SUMMARY

With competing needs for scarce funds, the Gorham Plan identifies a few key renovation projects for near-term consideration. These projects, however, should be planned and designed with a campus-wide and long-term perspective. The capital renewal project list should includes:

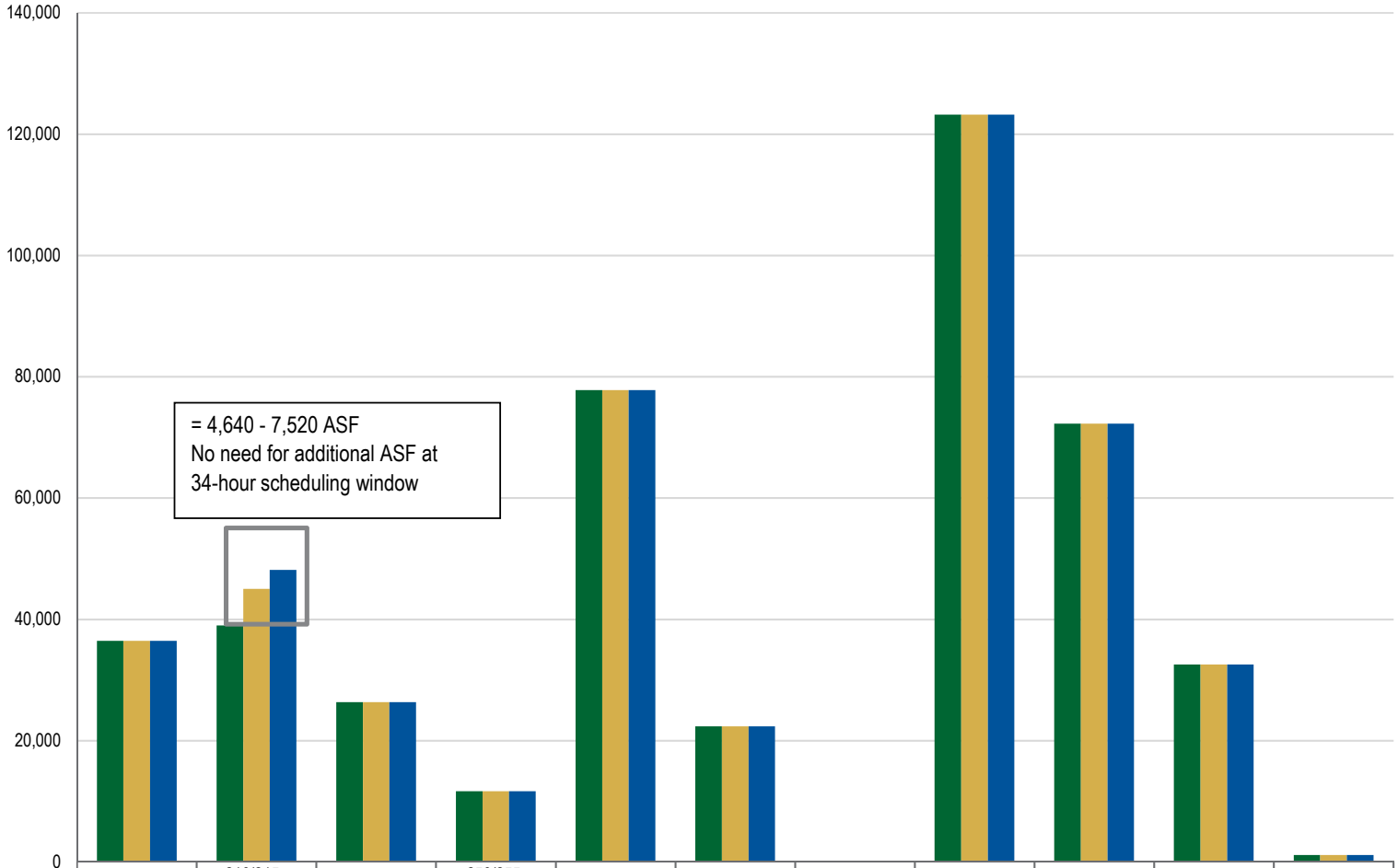
- **Art Facilities (Academy Building, Art Drawing Classroom, Art Gallery, Print Making Studio, Robie-Andrews Hall, and Welding Shop)**: Art is currently dispersed amongst six (6) buildings on the Gorham campus. Consideration was given to the future of the program to facilitate a collocation of the Art department. The department currently occupies 13,200 ASF in Robie-Andrews Hall that was described as "retrofit" and in poor quality for its current use.
- **School Street Houses:** Most of these houses are planned for demolition helping to balance the no new square feet policy.

The recommendations are based on the current culture and environment of the campus during The Gorham Plan process.

Regardless of renovation or new construction, in light of the budgeting climate today and for the foreseeable future, thoughtful and purposeful planning should continue to make the highest and best use of current facilities before advocating for new facilities and to serve the System's construction and sustainability policies. New or renovated spaces should incorporate, where possible, the flexibility needed to accommodate the changes that will inevitably come in the future.

The following graphs summarize space needs by FICM category for Current, Calculated, Current Adjusted, and Projected Adjusted Need, as well as the categories with specific deficits.

SUMMARY OF SPACE NEEDS AND DEFICITS BY CATEGORY



	100: Classroom	210/215: Class Laboratory	220/225: Open Laboratory	250/255: Research Laboratory	300: Office	400: Study / Library	500: Special Use	520/525: Athletics	600: General Use	700: Support	800: Health Care
Current ASF	36,464	38,995	26,350	11,632	77,804	22,345	161	123,201	72,270	32,562	1,121
Current Adjusted	36,464	45,027	26,350	11,632	77,804	22,345	161	123,201	72,270	32,562	1,121
Proj. Adjusted 1,502.8 FTE	36,464	48,147	26,350	11,632	77,804	22,345	161	123,201	72,270	32,562	1,121

Gorham Facilities and Resources

The Gorham campus is in 26 principal structures sited on 96 acres. A number of small former residential structures have been acquired on the perimeter of the campus along College and School Streets. The average age of the primary building stock is 71 years old, sixteen of which are over 50. Building systems have an expected usable life of 20-40 years, beyond which they become inefficient, obsolete or risk failure.

Many of the oldest buildings on the Gorham campus are contributing structures to the Gorham Campus Historic District listed on the National Register of Historic Places in 1978. These date back to the original Academy building constructed in 1806 while Maine was still a part of the Commonwealth of Massachusetts. Considerable diligence should be given when considering maintenance and renovations to ensure compliance with Department of Interior's guidelines for historic structures. The following buildings are part of this district:

- Academy Building (1807)
- Art Gallery (1821)
- Corthell Hall (1878)
- Robie Hall (1898)
- President's Residence (1906)
- Andrews Hall (1916)
- Russell Hall (1931)

The Gorham Plan suggests priority buildings for investment and identifies buildings that may be better suited to demolition, disposition, or replacement based on several criteria: do they enhance the character of the campus, are they historically significant, do they require disproportionate investment in deferred maintenance costs, and do they represent the highest, best use of land resources?

Residential properties acquired on the perimeter of the University provide land for future growth. These buildings front onto and contribute to residential neighborhoods. The following facilities are identified for possible demolition and replacement over the long-term to make better use of campus land and infrastructure:

- Dickey Wood (81,439 SF)
- Printmaking (1,555 SF)
- Drawing Studio (3,696 SF)
- 51 College Street (10,204 SF)
- 62 School Street (3,336 SF)
- 128 School Street (9,005 SF)
- 7 College Street (7,063 SF)
- 134 School Street (4,144 SF)
- 19 College Street (4,109 SF)

Facilities Condition

A visual assessment of building facility conditions was conducted as part of the master plan. Buildings and their systems were evaluated on a scale of 0–55. Thirty different building systems were evaluated in eight major categories included the building exterior, interior construction, life safety systems, electrical, lighting, mechanical systems, plumbing, and visible structure.

A resulting building facility condition ranking is based on an average of the individual building system assessments. Buildings are grouped into the following condition categories:

Poor	Fair	Average	Good
0–1.99	2.0–2.99	3.0–3.99	4.0–5.0

This analysis reveals that the majority of the USM facilities on the Gorham campus are in the average to poor condition. Two-thirds of

the buildings surveyed (21 out of 29) were in fair or poor condition. The remainder were in average to good condition.
The master plan identifies the following facilities for reinvestment in order to address the most acute needs on the Gorham campus.

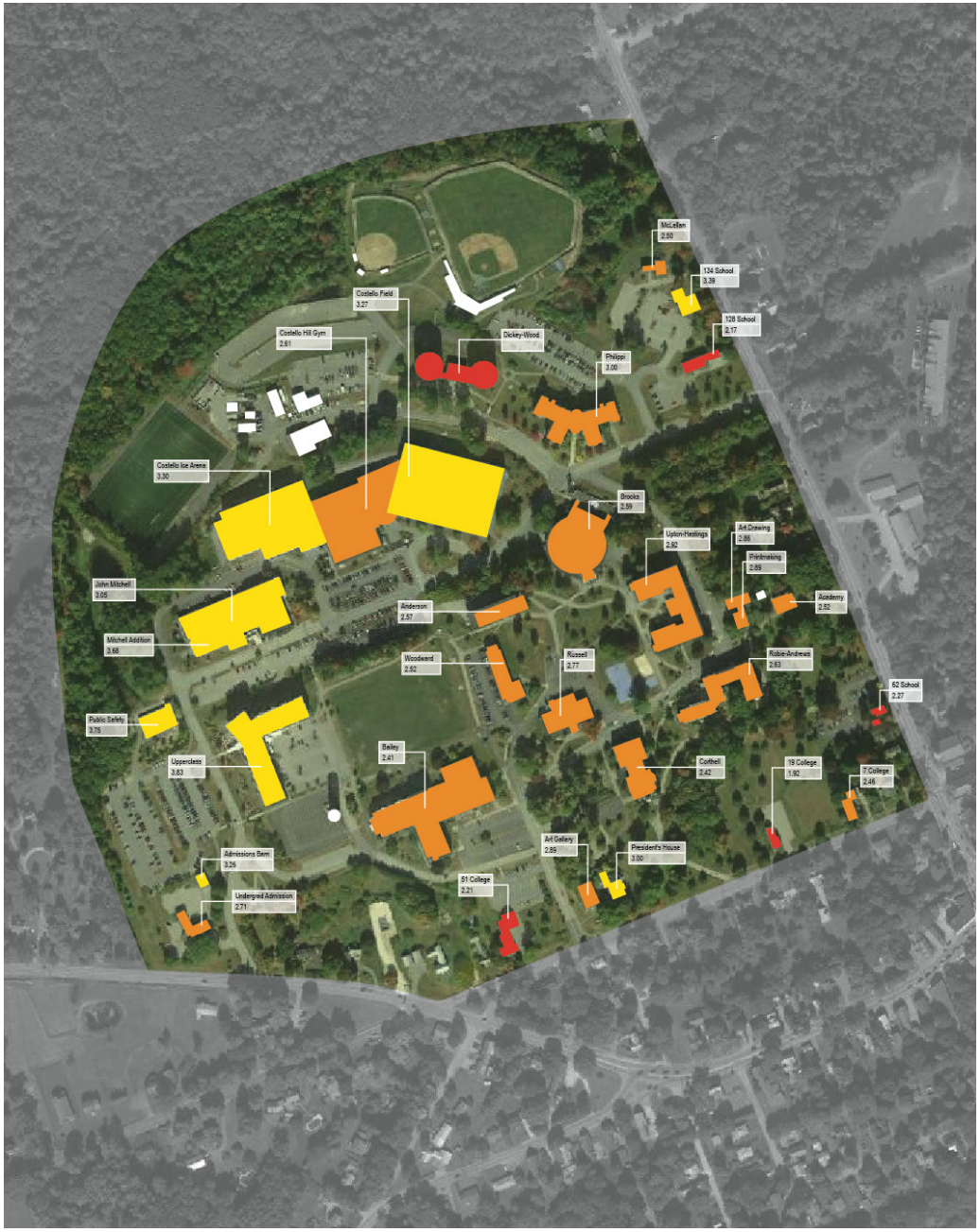
- Bailey Hall (144,374 SF)
- Woodward Hall (20,781 SF)
- Anderson Hall (29,293 SF)
- Brooks Student Center (45,700 SF)
- Corthell Hall (47,971 SF)
- Academy Building (7,126 SF)
- Robie-Andrews (76,859 SF)
- Russell Hall (29,467 SF)
- Upton-Hastings (102,656 SF)

CAMPUS INFRASTRUCTURE

Storm Water

The Gorham Campus is permitted through the Maine Department of Environmental Protection Agency through the Site Location of Development Act as well as regulated by the Environmental Protection Agency (EPA) under the Phase II Storm Water Rules as an institutional user with storm water discharges to a Municipal Separate Storm Sewer System (MS4). Any new construction or redevelopment on the campus since the mid 1990s has been designed with formal storm drain collection and storm water quantity and quality control measures.

Storm water runoff from the entire campus is tributary to a perennial stream known as Tannery Brook, which flows in an easterly direction away from the campus with eventual discharge into the Presumpscot River and Casco Bay. The Gorham campus contains approximately 105 acres of land, which is divided between two major drainage



watersheds. Approximately 82% (86 acres) of the campus is located within the northerly watershed that drains directly to Tannery Brook, which flows along the northeasterly boundary of the campus. The remaining 18% (19 acres) of the campus is located within the southeasterly watershed that discharges to the Town of Gorham municipal storm drain system within College Avenue and School Street.

The overall storm drain system contains approximately 18,200 linear feet of storm drain pipe, approximately 2,700 linear feet of open drainage swales, approximately 180 manhole or catch basin structures, 2 storm water quality dynamic separator units, 3 storm water quality wet ponds, 1 storm water quality bioretention basin, and 1 dry storm water detention basin. Any new or redevelopment that occurs within the older portion of the campus and particularly the southeasterly watershed area will likely require replacement and/or significant upgrade to the system in order to provide suitable storm drain connections as well as provide necessary water quality treatment required to meet the state and federal regulations. Any new or redevelopment that occurs within the newer portions of the campus can likely be supported with minimal upgrade or extension of the storm drain system. Incremental expansion of the existing water quality treatment systems and/or installation of new water quality treatment measures will need to be evaluated on a project-by-project basis.

Sanitary Sewer

The overall sewer system contains approximately 9,350 linear feet of gravity sewer pipe and approximately 49 sewer manhole structures. Sanitary sewer system materials throughout the campus range with the age of the installation. The older portion of the sanitary sewer (predating 1970) consists of brick or barrel block manhole structures with vitrified clay (VC) or asbestos cement (AC) pipe. The overall condition of these pipes is unknown and televised inspection of these lines should be performed to document the condition of these lines and identify any areas in need of repair. The newer portion of the sanitary sewer system (post 1970) consists of precast concrete manhole structures with polyvinyl chloride (PVC) pipe. The overall condition of these pipes is unknown; however, it is generally anticipated that the sanitary sewer system in the newer portions of the campus are in good condition. All existing sanitary sewer mains have adequate capacity to serve the campus and should have adequate capacity for any potential expansion and development of additional buildings.

Domestic Water

The campus water system is shared between domestic water, sprinkler systems and fire hydrants. Over 500,000 gallons of water is stored in the water storage tank on campus. The highest projected continuous draw on the campus water system at any one time is when it has to meet the design demand for a single sprinkler system operation. When the sprinkler system in a building is activated, the highest demand on campus is up to 450 gallons per minute with a fire hydrant allowance of 250 gallons per minute for a total of 700 gallons per minute.

The estimated maximum flow through the domestic water system in any single building may be up to 100 gallons per minute. In most buildings the maximum flow is estimated at 20 gallons per minute or less. The estimated flow of domestic water during a peak time of the day with all campus buildings combined could be up to 600 gallons per minute.

The water distribution system is adequately sized to handle the load of the domestic and sprinkler demands of the campus. 10” and 8” mains loop around the campus to provide good volume and pressure to the buildings. The only large building requiring pressure boosting is the Upperclass Residence Hall because of its building height and proximity on campus. The president’s house also has a small domestic water boosting system located in Corthell Hall, but it is not used due to the installation of a hydropneumatic tank in the president’s house.

The water system is capable of substantial expansion. Recorded hydrant flow tests indicate approximately 1,300 gallons per minute flow capacity with a 20 psi drop from static pressure. Because only one building is considered to flow during a fire event, adding buildings to the system does not increase the fire demand. The domestic water system could accept a 200% increase in domestic water demand and still be sufficient.

Central Heat Plant

The boiler plant consists of boilers #1 and #2—600 boiler horsepower (bhp) each—and #3 which is 200 bhp. The current boiler plant capacity could be retained to provide full redundancy for potential growth on campus pending the continued practice of shedding the domestic loads in an emergency failure mode.

Primary Power

The Campus primary underground electrical distribution system is a modified radial loop feed served from one riser pole by CMP Co. at 12,470 volts with a single primary billing meter. This master plan recommends adding a second Primary Service from CMP along State Street (Rt.25) or College Ave to provide redundancy, increase the loop capacity and improve reliability. The 12.47 kV equipment on campus ranges in age from five to more than 50 years old. Similarly, its condition can be described as excellent to fair. Reliable, expected life of medium voltage equipment and cable is 30 to 40 years. The biggest concern is the six transformer vaults on campus that have exposed live terminations in confined spaces. These cannot be maintained while energized. Also of concern are reports that the expulsion fuses in the Brooks Student Center vault serving Philippi Hall have blown on more than one occasion.

Based on historical demand growth, the campus loop feed distribution system would have sufficient capacity to increase for the foreseeable future.

Campus Data

The campus fiber backbone was installed over multiple phases beginning in the early 1990s and consists of a number of technologies including 50-micron multimode fiber, 62.5-micron multi-mode fiber, and single mode fiber optic cable. 62.5-micron multi-mode fiber optic cable is currently the primary means of inter-building campus connectivity. Corthell Hall acts as the primary distribution point. Most of the campus backbone cabling is installed in conduits. There is little room in the individual facilities with regard to dedicated space for technology closets, IDFs or MDFs. Some of the horizontal cabling is Category 3. The general recommendation is to eventually upgrade the fiber backbone to 50-micron and the horizontal cabling to Category 6 compliance.

Lewiston-Auburn Space Needs Analysis

LEWISTON-AUBURN RECOMMENDATIONS

There is currently no space deficit for the campus. If Lewiston-Auburn reaches the 347.8 FTE achieved in Fall 2013, then there would be a potential need for an additional 7,000 ASF in Class Laboratory space. This finding is based on the proposed enrollment of 347.8 FTE, as well as maintaining the currently compressed scheduling window of 25 hours per week. To meet the calculated deficit is an optional non-capital suggestion to expand the scheduling window from the compressed 25 hours a week to a more normative 34 hour per week. This would eliminate the need entirely for additional teaching labs and would bring the campus back to alignment with similar institutions related to scheduling windows.

If the desire is to maintain a compressed scheduling window, an area for more detailed review is the potential availability of 3,000 ASF of surplus office space. While, by the numbers, the ASF could meet the space needs, the existing areas may not be able to be re-purposed for teaching laboratory space. Before building another space, care must be taken to critically examine available space and better define, repurpose, and refurbish it for more collaborative and efficient use.

The following summarizes the space needs by category and identifies areas that may require specific additional review.

Instructional (100)

At the time of this analysis, there were nine (9) spaces and 6,987 ASF identified as general-purpose classrooms available for scheduling. One classroom was unscheduled in Fall 2017 (Lewiston-Auburn College 110–627 ASF) and has been excluded pending space type confirmation. There are an additional four rooms and 2,222 ASF

Space Type	Current ASF	Current Adjusted 244.6 FTE	Surplus or (Deficit) to Current ASF	Projected Adjusted 347.8 FTE	Surplus or (Deficit) to Current ASF
100: Classroom	9,209	9,209	0	9,209	0
210/215: Class Laboratory	8,900	8,900	0	15,764	0 to (6,864)
220/225: Open Laboratory	1,943	1,943	0	1,943	0
250/255: Research Laboratory	2,480	2,480	0	2,480	0
300: Office	12,517	9,271	3,246	9,271	3,246
400: Study/Library	7,233	7,233	0	7,233	0
500: Special Use, General	3,529	3,529	0	3,529	0
500: Athletics	0	0	0	0	0
600: General Use	10,862	10,862	0	10,862	0
700: Support	6,235	6,235	0	6,235	0
800: Health Care	0	0	0	0	0
Total	**62,908**	**59,662**	**3,246**	**66,526**	**0 to (6,864)**
Other Space (000's)	623	623	623	623	623

of classroom space that was dedicated to specific programs. The analysis was conducted on the eight (8) general-purpose classrooms and 6,360 ASF.

The figure on the following page presents the existing distribution and calculated need for classrooms at both the existing scheduling protocol of 25 hours, as well as applying the 34-hour daytime scheduling window for comparison. For both analyses, the need was calculated based on guidelines of 67 percent average weekly daytime hour utilization, and average seat occupancy.

The table aligns the existing distribution of rooms by capacity (seat count) to the need. Using the existing stock of rooms, seat counts, and ASF, a theoretical exercise of "right-sizing" was conducted, which is mathematically calculating the appropriate capacity of the existing rooms. While right-sizing does not change the total number of classrooms available, it can often bring the distribution of classroom capacities into better alignment with course section sizes.

Lewiston-Auburn is relatively on target for ASF/seat and so the re-alignment of rooms by capacity did not provide any major changes. As such, the existing rooms can be maintained and meet the necessary space requirement for current enrollment and course offerings. While there is a calculated need for a larger space, the largest enrollments are 40 to 42 students for three Occupational Therapy courses. Courses such as these could be taught in the large meeting room, Lewiston-Auburn College 285, vs. building a new space, unless there is a future goal to increase the enrollment in course sections and/or provide more cohort meeting spaces.

CLASSROOM NEED

CATEGORY	EXIST.	29-HOUR		34-HOUR		OPTIMIZE EXISTING SPACE	
		CALC. NEED	PROJ. CALC	CALC. NEED	PROJ. CALC	RT.-SIZE EXIST.	ADJ.
1 to 20	2	2	3	2	3	0	2
21 to 30	4	2	1	1	0	1	4
31 to 40	2	0	1	0	1	6	2
41 to 50	0	0	0	0	0	0	0
51 to 60	0	1	1	1	1	1	0
Total	**8**	**5**	**6**	**4**	**5**	**8**	**8**
ASF	6,360	3,820	4,450	3,070	3,700	6,360	6,360
Seats	219	140	190	130	160	293	219

Specialized/Research (200/250)

Specialized Instructional

There are seven (7) spaces and 7,715 ASF assigned to instructional lab space, such as Biology, Nursing, Occupational Therapy, etc. Space needs for specialized instructional space are based on the number of hours by the discipline of the courses as many courses/programs cannot share space. Where opportunities to continue shared use of the spaces between similar courses were possible, these were maintained. Using the rubrics of 80 percent occupancy, 50 percent utilization, and discipline-specific ASF per station, it is recommended that Lewiston-Auburn maintain its current complement of SI spaces. Specialized instructional space needs are presented in the table on the following page.

At the projected FTE, and compressed window, there would be a need for two additional Biology–Anatomy and Physiology Labs (2,880 ASF), and an additional Occupational Therapy Lab (2,400 ASF).

At the 34-hour window, there would be no need for additional teaching labs.

SPECIALIZED INSTRUCTIONAL SPACE NEED

DISCIPLINE	ADJUSTED				2017 EXISTING				INCREMENTAL			2017 EXISTING + INCREMENTAL			NOTES
	ROOMS	STATIONS PER SPACE	ASF PER STATION	TOTAL ASF	ROOMS	TOTALS STATIONS	ASF	ASF PER STATION	ROOMS	TOTAL STATIONS	ASF	ROOMS	TOTAL STATIONS	ASF	
Biology–Anatomy and Physiology	2	48	60	2,880	1	38	1,534	40.4	0	0	0	1	38	1,534	Maintain existing
Biology–General	1	24	60	1,440	1	25	983	39.3	0	0	0	1	25	983	Maintain existing
Chemistry–General	0	0	0	0	1	26	986	37.9	0	0	0	1	26	986	Unscheduled Fall 2017; Maintain existing for discussion
Nursing	2	16	80	2,560	2	42	1,394	33.2	0	0	0	2	42	1,394	Maintain existing
Occupational Therapy	2	40	60	4,800	2	64	2,818	44.0	0	0	0	2	64	2,818	Maintain existing
Grand Total	**7**	**128**		**11,680**	**7**	**195**	**7,715**	**39.6**	**0**	**0**	**0**	**7**	**195**	**7,715**	

Qualitative issues need to be identified and addressed.

Research

There is a continued desire for this type of student/faculty engagement space on campuses throughout academia. Currently, Lewiston-Auburn has 2,480 ASF of faculty research lab space, shared amongst Natural Sciences faculty. The current ASF meets the needs of the campus as a whole and has been held for the Adjusted need.

Office (300)

Lewiston-Auburn has 48 FTE (49 headcounts) faculty/staff on campus, housed within 12,517 ASF of office and associated support space. Office space ranges from 68 ASF in Lewiston-Auburn College 121A to 809 ASF in Lewiston-Auburn College 119 (both assigned to the Provost), with an overall average of 146 ASF across faculty, staff, and administrative spaces. The application of appropriate planning multipliers and assumptions that the spaces are properly outfitted and usable, result in the need for 9,271 ASF, which is about 3,000 ASF less than the current existing.

Those spaces that are less than 90 ASF should be reviewed for appropriateness in terms of assignment and use. As the campus moves forward with the master plan, putting office guidelines into effect should be considered to begin standardizing the size of offices across the campus. It is acknowledged however that there are some "oversized" spaces that may limit the ability to apply these metrics.

Library/Study (400)

The library and study space category encompasses almost 7,250 ASF and meets the needs of the campus, overall.

Library space has become the learning commons at many institutions and incorporates coffee bars, some social areas, group study rooms, etc. It is understood that many renovations are

underway to incorporate more tutoring space into the Lewiston-Auburn College library.

Special Use (500)

Lewiston-Auburn recently added a 3,203 ASF clinic space for the Masters of Occupational Therapy program. In addition, the campus has a small greenhouse located in LAC 209D (326 ASF). The existing spaces appear to meet campus needs and have been held as Adjusted.

General Use (600)

The General Use FICM space category consists of various clusters including assembly, exhibition, food service, and meeting rooms (student-centered services). Some of the highlights of this area: Assembly: Lewiston-Auburn College 170 is assigned to this category. The ASF is appropriate for a campus of this size and will support a minimal uptick in enrollment.

- **Dining:** Currently, the main dining service is the Lewiston-Auburn College Café located adjacent to the Library. Today's students are looking for more inviting and varied dining experiences, featuring specialty food stations, high top tables, booths, comfortable seating, and connectivity—spaces and furnishings that promote easy interaction. Although the overall ASF for dining has been maintained, location, function, and aesthetics may need to be refreshed.
- **Recreation:** This space type is often found in student centers and consists of game rooms, TV lounges, general fitness rooms, etc. Lewiston-Auburn has recently added a 778 ASF fitness center that meets this need.
- **Meeting Rooms:** This type of space is generally available to internal and external groups such as study groups, board meetings, community groups, etc. There are multiple spaces on campus that meet the calculated need. The challenge for these spaces is the lack of storage areas for food service, tables, chairs, etc.

Central Facilities (700)

Central Facilities (6,235 ASF) support overall campus operations and include mail, receiving, general storage, and shop space, among others. The current ASF, while below the calculated need, meets the requirements for the campus.

Health Services (800)

There are currently no health services facilities on campus and no plans for adding space in the foreseeable future.

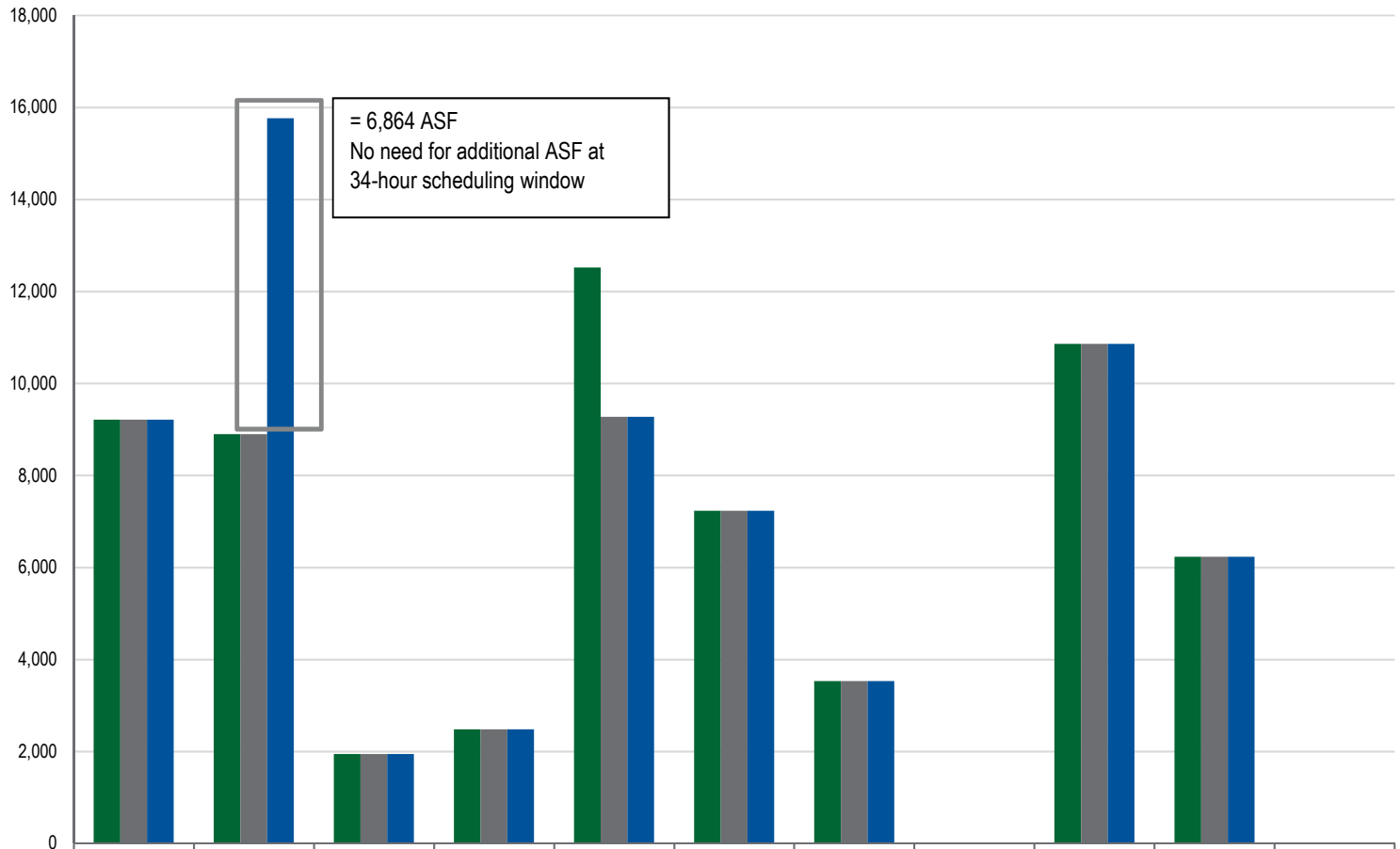
Residential (900)

There are currently no plans for residential facilities in Lewiston-Auburn.

Summary Need

The following graphs summarize space needs by FICM category for Current Adjusted and Projected Adjusted Need.

SUMMARY OF SPACE NEEDS AND DEFICITS BY CATEGORY



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Current ASF	9,209	8,900	1,943	2,480	12,517	7,233	3,529	0	10,862	6,235	0
Current Adjusted	9,209	8,900	1,943	2,480	9,271	7,233	3,529	0	10,862	6,235	0
Proj. Adjusted 347.8 FTE	9,209	15,764	1,943	2,480	9,271	7,233	3,529	0	10,862	6,235	0

UNIVERSITY OF SOUTHERN MAINE

Student Housing Advisory Services

BRIEFING DOCUMENT // AUGUST 2019



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PREFACE

In January 2019, the University of Maine System ("UMS") engaged Brailsford & Dunlavey, Inc. ("B&D") to provide development advisory services related to new student housing at the University of Southern Maine ("USM", the "University"). As part of this initiative, B&D assessed current and future student housing needs at USM and quantified demand for a new student housing project on USM's Portland Campus. In addition, B&D advised USM on a range of possible implementation strategies to enhance its student housing inventory in accordance with the University's Facilities Master Plan.

The following document summarizes the key market findings and strategic considerations that resulted from the assessment. The findings contained herein represent the professional opinions of B&D's personnel based on the assumptions and conditions detailed in this assessment.

The methodologies employed as a part of this assessment included the following:

- A ***Strategic Asset Value ("SAV") work session*** was conducted with University leadership to identify and prioritize the strategic objectives that the Student Housing Project must address in order to advance the University's broader mission and vision. The SAV served to guide all subsequent research and the results from this advanced planning effort.

- An ***off-campus housing market analysis*** was performed to better understand cost, amenities, competition, and other key metrics of the off-campus housing market proximate to USM's Portland campus. Understanding the dynamic rental market in the Portland area determined how the University must proceed to differentiate its housing from the private sector to better meet the needs of its upper-division (third- and fourth-year) undergraduate, graduate, and law students.

- An ***Internet-based survey*** was administered to USM's entire student population to assess their current housing patterns and future demand preferences. In total, 895 students, or 11% of the population, responded to the survey, which provided statistically reliable data with a 95% confidence interval and a 3.3% margin of error. B&D sorted survey responses by various demographic characteristics, including classification, primary campus, etc. to better understand the unique aspects of USM's Portland campus housing demand at a sub-demographic level. Insights generated by the student survey allowed the Project Team to identify a primary target market for the initiative as well as characterize the programmatic nature of the resulting demand projections.

- A ***student housing demand assessment*** was performed using B&D's proprietary demand-based programming ("DBP") methodology, which determined demand utilizing statistically significant survey responses and enrollment assumptions provided by the University. Demand figures for housing on USM's Portland campus were projected based on the target market's preferences for various unit types, bedroom occupancy arrangements, and room rates, which were all tested as a part of the survey. The room rates associated with the unit types tested in the survey were generated using market-based rent assumptions that would result in the delivery of a financially self-sufficient project.

- ***A project-specific programming effort and financial analysis*** were performed to identify the optimal project concept to advance the University's strategic objectives within the existing market context. The resulting project concept established a road map for how the University could most effectively address the housing needs of its students in a manner that responded to the target market's demonstrated rental rate sensitivity. This synthesis of strategic objectives, market

opportunities, and contextual realities also served as a way to communicate the University's expectations to potential third-party development partners in the form of required project outcomes.

B&D would like to thank the following administrators at UMS and USM for their leadership and support throughout the project process *(sorted alphabetically)*:

- Glenn Cummings, President
- Tracy Elliott, Director of Finance and Controller
- Rudy Gabrielson, Chief Procurement Officer
- Nancy Griffin, VP Enrollment Management and Student Affairs
- Christina Lowery, Director of Housing and Residential Life
- Carolyn McDonough, Director of Capital Planning and Project Management
- Alexander Porteous, CFO
- David Roussel, Interim VP of Student Affairs
- John Souther, Executive Director of Facilities Management
- Justin Swift, Senior Finance Business Partner
- Adam Thibodeau, Assistant Director of Capital Planning and Project Management
- Aaron Witham, Assistant Director for Sustainable Programs

The B&D team responsible for developing this assessment comprised the following individuals:

- Brad Noyes, Executive Vice President
- Alan Resnick, Vice President
- Meg Green, Associate
- Javaneh Jabbari, Senior Analyst

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PROJECT INTRODUCTION

USM is one of the seven public universities which comprise the University of Maine System. USM has three campuses, located in Gorham, Portland and Lewiston-Auburn. The University enrolled 8,140 students across all three campuses in the fall of 2018 and anticipates future enrollment growth to reach 10,000 in the near future. While USM experienced an overall decline in enrollment over the last decade, enrollment has recently rebounded, increasing from 7,739 in fall 2015 to 8,140 by fall 2018.

USM's Portland campus is located in the heart of Portland, Maine, the state's largest city and economic and cultural center. Most USM students (64%) take the majority of their academic classes at the Portland campus. The Portland campus does not currently offer any student housing. USM envisions expanding its on-campus housing portfolio on this campus to support students' academic and career aspirations as well as ensure a robust student life experience. Located 11 miles away from the Portland campus, USM's Gorham campus is the only residential campus at the University. In fall 2018, the Gorham campus' housing inventory comprised 1,180 beds, available to all degree-seeking USM students. The housing portfolio is occupied beyond its design capacity, with fall 2018 occupancy at 112% of current capacity.

USM completed a Facilities Master Plan in January 2019. The Master Plan's vision for the Portland campus is "to build sustainable, iconic academic campus in the heart of Portland, enhancing the commuter experience while creating a welcoming residential community". Therefore, USM has been strategically focusing on providing student housing on its Portland campus for upper-division (third- and fourth-year) undergraduate, graduate, and law students.

KEY FINDINGS

B&D developed the following key findings, synthesized from the results of the aforementioned analyses, to characterize the market opportunity that exists for student housing to advance USM's identified strategic objectives for its Portland campus.

- Portland is a desirable place for students to live, but competitive market conditions have created a barrier to entry for many students. The private housing market is very tight and rental rates are above what students can afford to pay. In B&D's student survey, 71% of USM students who live off campus indicted finding and securing housing accommodations to be at least somewhat difficult.

- B&D's survey indicated that 64% of USM students considered affordability to be the primary factor in their current housing decision. As housing prices tend to be less expensive outside of downtown Portland, many students are widely dispersed throughout the city as well as outside of it. According to the student survey, 63% of USM students who live off campus live outside of Portland and have an average one-way commute to campus of 28 minutes.

- B&D surveyed 7,083 rental housing units in the Portland market, the majority of which were not student-focused units. The reported average rent per unit was $1,296 per month, without utilities, whereas 70% of USM students who live off campus indicated paying less than $700 per month for their housing accommodations, excluding utilities. As 58% of these students don't share a bedroom with another person, this further indicates students rely on the market outside the Portland area to find affordable living accommodations that offer the privacy they desire.

- Proximity to campus was also identified as a critical housing preference for upper-division, graduate, and law students. Forty-six percent (46%) of these students selected proximity to campus and on-campus resources as the second greatest factor which contributed to their decision where to live during the 2018-19 academic year. As these students are more likely to have the majority of classes on the Portland campus, this suggests a strong likelihood that students will prioritize any potential new on-campus housing offered on the Portland campus.

- B&D's survey of USM students tested a variety of unit types at varying rental rates. The survey specifically tested unit types at the rental rates that are comparable to the housing market in the city of Portland. B&D's proprietary demand-based programming model focused on the demand from upper-division, graduate and law students most likely to choose on-campus housing. B&D identified approximately 674 beds of demand for housing at the Portland campus for the current academic year (2018-19).

- Based on the demand analysis, B&D found that USM students seek the most affordable housing options while maintaining their privacy. This was demonstrated through students' unit-type preferences, in which they prioritized private (single bedroom) options with the least cost. Thirty-five percent (35%) of the demand for on-campus housing on the Portland campus was for the single bedroom with en-suite bathroom unit (the cheapest available option), and 40% of the demand was for a single bedroom in a two- or four-bedroom apartment.

- It is clear that USM students desire to maintain their privacy while maximizing affordability. Therefore, minimizing the size of residential units and out-of-unit programming space is paramount to ensuring affordability. As a result, residential support spaces must be limited, and alternative methods of fostering a vibrant, community-oriented atmosphere should be explored.

KEY FINDINGS

INTRODUCTION

Established in 1970, USM comprises three campus locations in central and southern Maine, a region that is viewed nationally as among the most livable and desirable in the country. The three campuses, located in Portland, Gorham, and Lewiston-Auburn, have substantially different physical features and dynamics, and each offers a variety of educational, cultural, and recreational opportunities for USM students.



Figure 1 - USM Campus Locations, Captured from the USM Facilities Master Plan.

USM's Portland campus is located at the heart of city of Portland, nationally known for its arts and culture, outdoor recreation, and dynamic food scene. Portland is the largest city in Maine and the economic center of the state. Approximately 64% of USM students take the majority of their courses at the Portland campus. The Portland campus offers a variety of programs to its students including business, law, nursing, biology, history, psychology, sociology, economics, political sciences, etc.

Located eleven (11) miles away from the city of Portland, the Gorham campus is located in a small town with a suburban setting. The Gorham campus is USM's only residential campus and the center of undergraduate life at USM. The primary academic areas residing in Gorham are industrial technologies, engineering, art, music, theater, counseling and education, anthropology, geography, environmental sciences, and geosciences.

The Lewiston-Auburn College (LAC) is located in Maine's second largest city which is known for its diversity, low cost of living, and substantial access to medical care. The LAC offers a small college atmosphere and provides programs that are responsive to workplace demand in the state of Maine, such as arts and humanities, leadership and organizational studies, natural and applied sciences, social and behavioral sciences, and occupational therapy.

EXISTING CONDITIONS

In fall 2018, USM enrolled 8,140 students, including 6,390 (79%) undergraduate students, 1,497 (18%) graduate students and 253 (3%) law students. Since fall 2016, the annual enrollment trend has improved,

and USM's enrollment has grown approximately 2% annually. According to the USM Facilities Master Plan, the University's goal is to increase headcount enrollment to 10,000 students in the short term. To achieve these goals, USM is pursuing the following strategies:

- Providing a variety of financial-aid packages including merit scholarships, loans, and stipends for graduate student to attract more students
- Enrolling students with high academic achievements and increasing Presidential Scholars to admit students who are more adequate for higher education
- Staying focused on keeping tuition affordable for all students, specifically students form New Hampshire and Massachusetts with the NEBHE out of state tuition program
- Increasing out-of-state and international student population
- Adding additional academic programs on the Portland campus

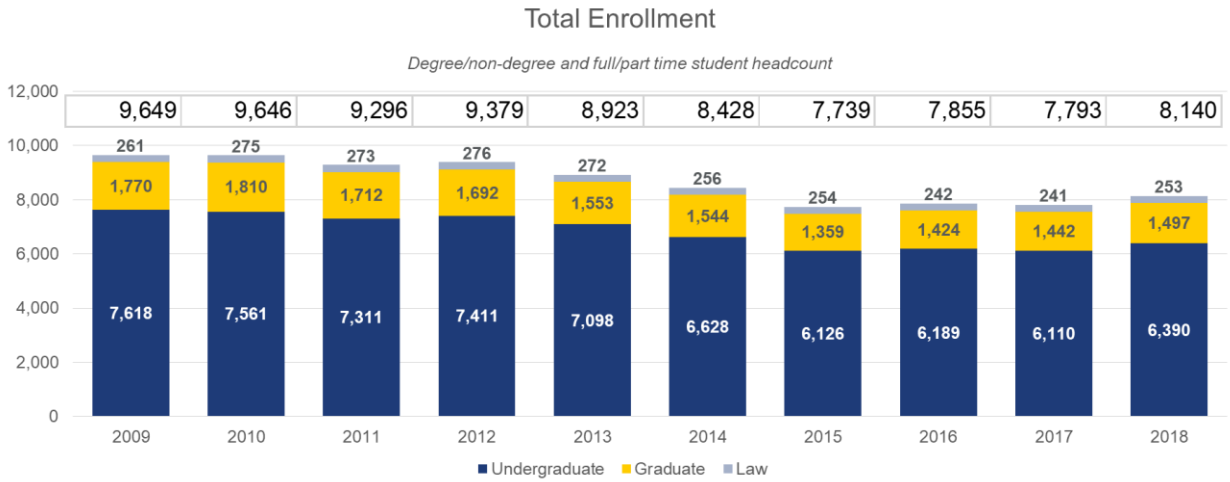


Figure 2 - USM Historical Enrollment, Fall 2009 to Fall 2018.

Since fall 2009, the percentage of out-of-state students has grown an average of 1% each year. USM has been committed to continue to grow this population of students through various initiatives including adding on-campus housing on the Portland campus.

USM currently offers student housing only on its Gorham campus. USM's 10 residence halls at Gorham primarily accommodate undergraduate students, though apartment beds in the Upperclass Hall also accommodate graduate and professional students. In fall 2018, 21% of USM's undergraduate students resided in residence halls on the Gorham campus. Almost all graduate and law students are accommodated in the off-campus market, with many living in the Portland area. In fall 2018, less than 1% of graduate students lived on the Gorham campus. The design capacity of the Gorham campus housing portfolio is 1,180 beds as of fall 2018. The housing portfolio is occupied beyond design capacity, with fall 2018 occupancy at 112% of capacity.

Residence Halls	Room Type	Room Occupancy	Specialty	Capacity	Year Built
Anderson Hall	Traditional	Double	First year	100	1963
Philippi Hall	Traditional, 3-/4-person suites	Single, double	Upperclass	200	2001
Robie Andrews Hall	Traditional	Single, double	Upperclass	200	1916; reno 1977
Upton Hastings Hall	Traditional	Double	First year	300	1960
Woodward Hall	Traditional	Double	First year	80	1955
Upperclass Hall	4-person suite, 4-person apt	Single (apt), double (suite)	Upperclass and graduate	300	2007
TOTAL RESIDENCE HALL CAPACITY				**1,180**	

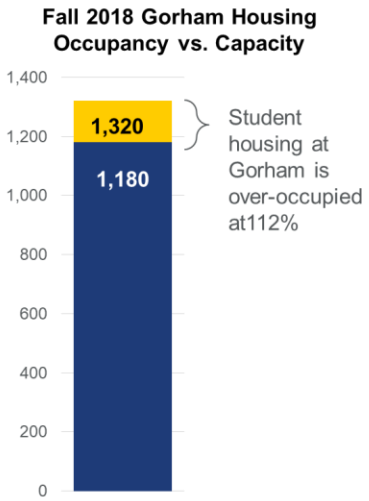


Figure 3 - USM Housing Inventory by Room Type and Occupancy.

USM's on-campus housing rental rate structure offers a variety of rates and options for students. Rental rates differ based on unit type and occupancy. In fall 2018, rental rates ranged from $555 per month ($2,500 per semester) for a double-occupancy traditional unit to $777 per month ($3,500 per semester) for a single-occupancy apartment in the newest housing available on campus. All students who are not living in apartments in Upperclass Hall, are required to have a meal plan. The least expensive meal plan, which provides 10 meals per week and $300 meal plan dollars per semester, cost approximately $2,300 per semester in fall 2018.

Despite aging conditions and maintenance issues facing several Gorham residence halls, students indicated relatively strong levels of satisfaction for the facilities, with apartment-style units driving the highest levels of satisfaction. USM students highly value the on-campus residential experience. According to student survey responses, 84% of USM undergraduate students and 80% of USM Graduate and Law students believe that on-campus housing is important in building a sense of community and culture on USM's campuses. This is further demonstrated by the housing inventory being over-subscribed at Gorham Campus.

STRATEGIC PRIORITIES & REQUIRED OUTCOMES

Providing student housing at USM's Portland campus is a mission-driven initiative to develop a robust collegiate environment within the larger Portland community. According to the Facilities Master Plan, USM's vision for the Portland campus is *"To build a sustainable, iconic academic campus in the heart of Portland, enhancing the commuter experience while creating a welcoming residential community".*

USM believes that this vision is critical to both supporting its students as well as the development of expanded professional relationships with the Portland community. The strategic drivers that support this vision were identified through a Strategic Asset Value ("SAV") work session with key University stakeholders representing a diverse range of campus functions and interests. The session developed a series of values that the on campus housing initiative must achieve.

Specifically, student housing at USM's Portland campus must:

- Provide a safe, high quality, and affordable student life environment that supports the well-being of USM's diverse student community;
- Create residences for upper-division (third- and fourth-year) undergraduate, graduate, and law students that is highly proximate to Portland campus academic resources and support;
- Construct housing that maintains affordability while assuring USM's continued financial sustainability;
- Design an iconic community that serves as a campus gateway, welcoming off-campus visitors while maintaining safety and security on the USM Portland campus;
- Create a development that not only elevates the presence of USM in the surrounding Portland community but also serves as a catalyst for community development and collaboration/connection between USM and Portland;
- Create a vibrant, connected student center environment that serves on- and off-campus student populations while maximizing efficiency through shared facilities infrastructure with student housing; and
- Demonstrate fiscal and environmental responsibility by striving towards sustainability goals outlined in USM's Facilities Master Plan.

In summary, the goal is creation of an affordable residential experience that meets these criteria will attract students to a dedicated gathering place that is proximate to on-campus activities and resources. Housing upper-division, graduate and law students closer to campus and to each other will create a dynamic, interdisciplinary residential atmosphere that will serve to comprehensively enhance collaboration, academic achievement, and the overall student experience at USM.

OFF-CAMPUS HOUSING MARKET CONTEXT

USM does not currently offer housing to its students on the Portland campus. Therefore, students who take the majority of their courses on the Portland campus either live on the Gorham campus or satisfy their housing needs by living off campus in Portland and its surrounding areas. Affordability is the top priority for USM students and the primary driver of their housing decisions. An analysis of survey responses found that 64% of USM students considered rental rate affordability to be the primary factor behind their current housing decision. Proximity to campus was also identified by students as a critical housing preference. Forty-six percent (46%) of USM students selected proximity to campus and on-campus resources as the second greatest factor which contributed to their decision of where to live during the 2018-19 academic year.

The Portland housing market is extremely dynamic and rapidly expanding. As an example, rental rates have become more expensive than what USM students feel they can afford. High rental rates have pushed students outside of downtown Portland to more affordable neighborhoods outside of the city. According to the student survey, 63% of USM students who live off campus live outside the Portland area and commute approximately 28 minutes to campus one way.

Based on the results of the survey, B&D analyzed USM students within three unique sub-demographic groups. The first group comprises on-campus students, who prioritize proximity to campus, student life and campus resources. Their strong desire to live near campus resources results in their decision to live on campus at Gorham campus. The second group consists of students who live off campus and in the Portland area. These students prioritize affordability as well as proximity to campus resources in deciding where to live off campus. Eighty-four percent (84%) of this sub-group take the majority of their courses on the

Portland campus. As a result, they seek housing options close to the Portland campus and in the Portland area. The third group are those students living outside the Portland area, who prioritize combined privacy and affordability. Proximity to campus is not their top priority in deciding where to live off campus. These students seem to care slightly more about unit-type configuration and they therefore seek accommodations outside of the Portland area to find their preferred unit types at a lower rental rate.

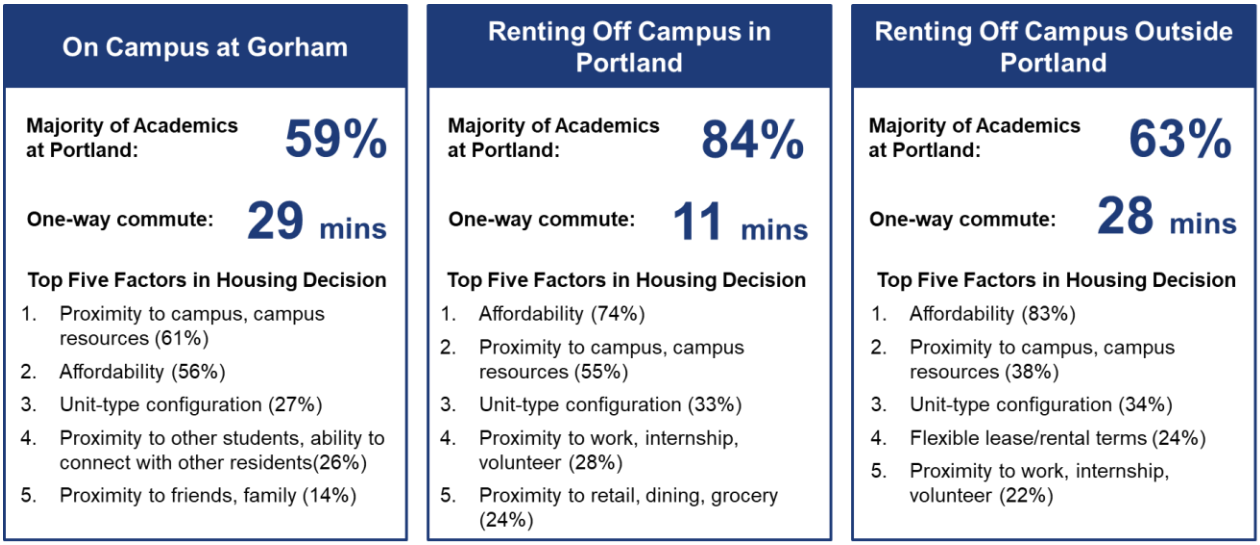


Figure 4 - USM Sub-Demographic Groups and Their Top Five Housing Decision Factors.

B&D conducted an analysis of the Portland multifamily rental market to quantitatively evaluate the options available to USM students. B&D surveyed 7,083 units in the Portland area. All data and rental rates are based on information provided by CoStar Group, Inc. and were evaluated using February 2019 data. In February 2019, the vacancy rate in Portland was 1.6% and had been decreasing consistently for the previous three months. There were zero properties under construction in the areas surveyed. There were two properties proposed (though not approved by the time of this analysis) to be built in the Downtown area, however, none of those units will be student focused.

B&D further identified Portland neighborhoods where students reported living based on the student survey. Approximately 40% of students who live in Portland reported living in neighborhoods located north of the 295 highway. An additional 4% of students were spread out between the East End, West End, Downtown, and Parkside neighborhoods. The other 12% lived among other Portland neighborhoods.

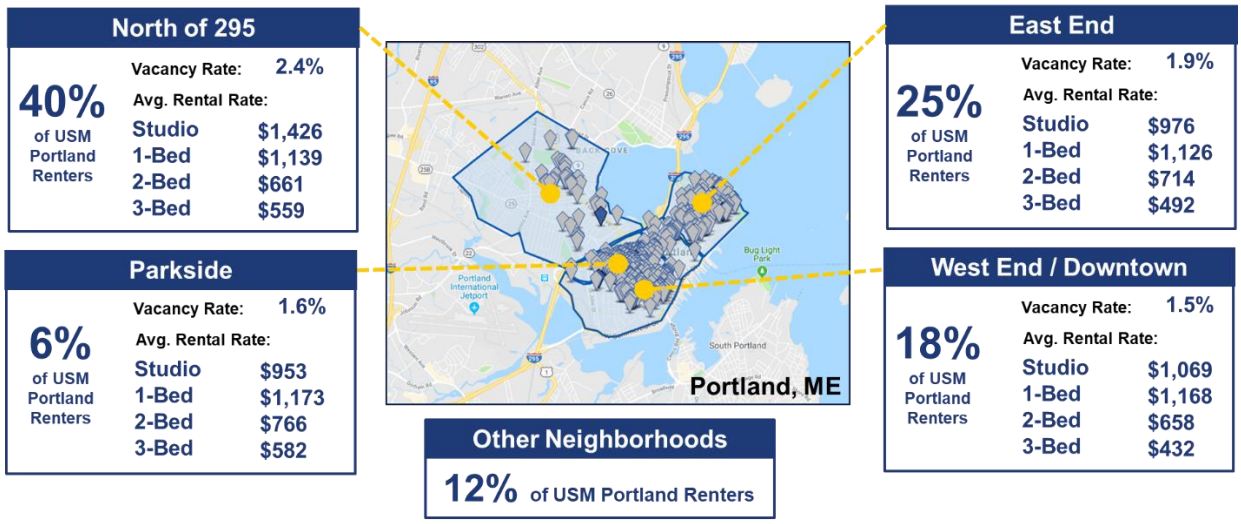


Figure 5 - Portland market average rental rates per person per month

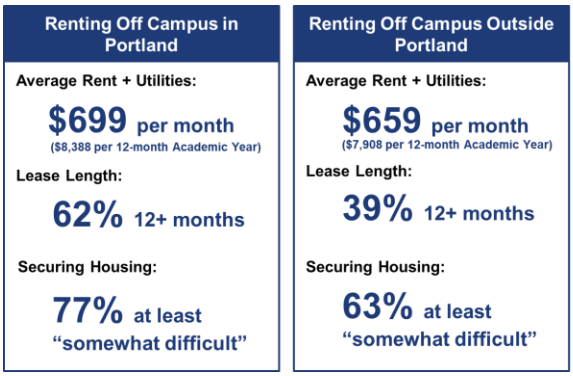
The average per-person rental rate in these neighborhoods varied by unit type. Excluding utilities, the average per-person monthly rent of each unit type is listed below:

- Studio apartment: $953 to $1,426
- One-bedroom apartment: $1,126 to $1,173
- Two-bedroom apartment: $658 to $766
- Three-bedroom apartment: $432 to $559

The overall average monthly rental rate per person as found through market research was $857 per month, excluding utilities.

In the survey, USM students reported paying $629 per person per month in rent (excluding utilities), over $200 less per month than the average found in the market. This suggests that students are finding units priced at the lower end of the market and are sharing bedrooms or units with roommates to further reduce costs. Additionally, students are relying on the market outside of the Portland area to find more affordable living accommodations.

B&D's analysis found significant differences between student renters that lived within Portland and those that lived outside of Portland. Those living in Portland were much more likely to rent a single bedroom (20%) and an apartment unit (76%) instead of a home (5%). They also were more likely to share spaces with non-family members; 74% shared a kitchen with a roommate and 70% shared a bathroom with a roommate. In addition, 3% shared a bedroom with a roommate. Those living outside of Portland prioritized affordability and unit type configuration over proximity to campus and campus resources. They were much more likely to rent a house (24%) instead of a bedroom (17%) or an apartment (59%). No student renters living outside of Portland indicated that they shared a bedroom with a non-family member, though 68% shared a kitchen and 53% shared a bathroom.



The survey also revealed a difference between the lease length and rental rates of students living within or outside of Portland. Sixty-two percent (62%) of students who rent in Portland were committed to 12-month or longer leases. Students renting off campus within Portland reported paying, on average, $622 in rent per month and $77 in utilities per month. Only 39% of students renting off campus outside of Portland reported a lease of 12 months or longer. Students outside of Portland paid a slightly lower average monthly cost of $588 in rent and $71 in utilities.

Figure 6 - Off-Campus Students' Housing Information by Location.

HOUSING DEMAND

Brailsford & Dunlavey developed a student housing demand model to quantify market demand for student housing at USM. The model derives demand from electronic survey responses as well as current and projected enrollment figures provided by the University.

By utilizing unit type (traditional, suite, and apartment) and occupancy (single room versus double room) preferences submitted by students in the electronic survey, B&D's demand-based programming model projects demand onto USM's 2018 as well as projected student enrollment. Enrollment was held flat in the model throughout the 10-year projection period.

Survey respondents were provided with a narrative description of hypothetical on-campus housing units that included sample floor plans along with their respective rental rates at the Gorham and Portland campuses. Students were informed that sample floor plans were for illustrative purposes only and were not drawn to scale. Estimated rental rates and unit floor plans based on market economics were provided in the survey. The survey rental rents were determined by assessing existing on-campus rates, rental rates in the off-campus market by unit type and identifying rates needed to support the potential cost of new construction at the Portland campus.

Following their review of the narrative, respondents were asked to indicate which unit type and occupancy option they would have selected to live in had it been available at the beginning of the current academic year (Fall 2018). In addition, a response option was provided to allow students to indicate whether they would have preferred off-campus housing over the proposed unit types.

The units and associated rental rates for the Portland Campus that were tested in the survey are illustrated below:



Figure 7 - Unit Types and Rental Rates Tested for the Portland Campus

Target Market

To project a realistic demand number, B&D developed a specific target market consisting of survey respondents who would likely be interested in leasing student housing on the Portland campus. A combination of survey data and B&D's expertise were used to develop the target market criteria. Only students satisfying the following criteria were included in projected demand:

- Were of degree-seeking status;
- Currently single with no dependents;
- Currently living on the Gorham campus OR;
- Contributing $500+/month to rent and not living with their spouse, dependent, or family members

All students who did not meet the aforementioned criteria were excluded from the demand analysis.

Demand Findings

This target market demand provided a baseline demand for additional filters, including USM policy, to be applied. With a few exceptions, USM prefers to accommodate all freshmen and sophomore students on the Gorham campus and reserve on-campus housing on the Portland campus for upper-division undergraduate (junior and senior) students, graduate students, and law students. B&D applied this policy overlay to determine housing demand on the Portland campus.

Total unmet demand for housing on the Portland campus during the 2018-2019 academic year at the rates for the target market above was 674 beds.

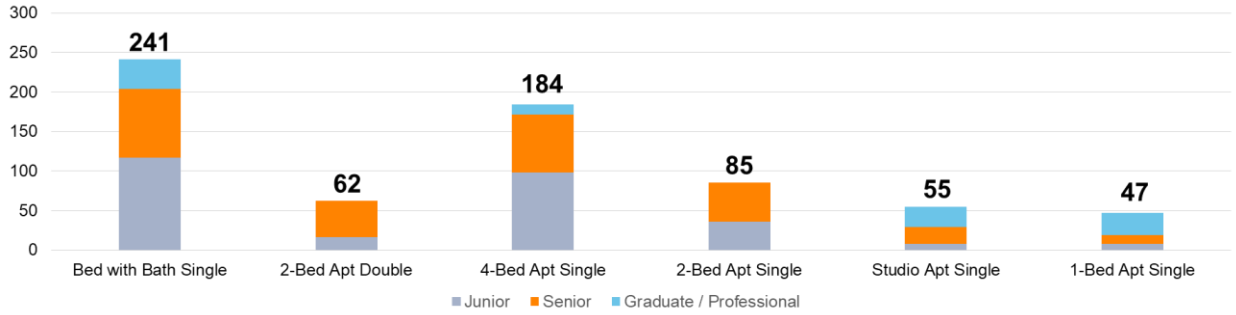


Figure 8 - Student Housing Demand for the Portland Campus

Market-driven demand determined by the results of the student survey demonstrated that students prioritized private options (single bedrooms) across the board, with only 10% of the students selecting a double-occupancy bedroom in a two-bedroom apartment. Furthermore, students mostly chose the least expensive option while maintaining privacy. Thirty-five percent (35%) of demand is for single bedrooms with en-suite bathrooms and 40% of the demand is for a single bedroom in a two- or four-bedroom apartment, all of which are among the less expensive single-occupancy housing options.

Future Housing Preferences

In the student survey, target market respondents indicated the most important building features/characteristics that should be considered in any new housing development, including overall affordability (92%), an in-building laundry facility (54%), parking (44%), desired unit-type configuration (41%), and a pet-friendly living arrangement (32%).

Further, the target market indicated a preference to be able to select their own roommate, retain the same unit from year to year, stay in their unit during breaks, and flexible lease terms. Factors that were less important included roommate matching service and fewer rules and regulations.

Five Most Important Building Features for Future On-Campus Housing	
1. Affordability	92%
2. In-Building Laundry	54%
3. Parking	44%
4. Desires Unit-Type Configuration	41%
5. Pet-Friendly Living Arrangement	32%

Figure 9 - Target Market Preferences for On-Campus Housing.

CONCLUSION

A dedicated Portland campus housing solution must be pursued in order for USM to effectively support the needs of its upper-division undergraduate, graduate, and law student community on the Portland campus. Maximizing participation from the target market, which is consistent with the USM's established strategic objectives, will require a development strategy that responds to the price sensitivity of these students, as highlighted above by the results of the analysis.

Creating an affordable housing solution that aligns with the USM's strategic objectives and responds to the associated market findings will help USM attract future students, as well as improve their access to the Portland community and its available resources.

Balancing demand for rental rate affordability and proximity to campus will limit the project's ability to include out-of-unit programmatic spaces that are deployed to build community within residence halls (i.e., lounges, game rooms, indoor recreation space, etc.). Choosing to include these kinds of dedicated programming spaces would result in additional square footage and therefore higher construction and operating costs that would ultimately be passed along to residents in the form of higher rental rates. Because maximizing affordability is paramount, programming spaces must be limited given the additional costs associated with these spaces, but yet identify creative ways to facilitate a dynamic, and interdisciplinary residential atmosphere taking advantage of co-location with the student center project that creatively advances USM towards its identified goals and vision.

University of Southern Maine
Student Housing Advisory Services
Exhibit A - Off-campus Market Data

Property Name	Property Address	City	Year Built	Vacancy %	Number Of Units	Avg Asking/Unit	Number Of Studios	Number Of 1 Bedrooms	Number Of 2 Bedrooms	Number Of 3 Bedrooms	Number Of 4 Bedrooms	Avg Unit SF	Studio Asking Rent/Unit	One Bedroom Asking Rent/Unit	Two Bedroom Asking Rent/Unit	Three Bedroom Asking Rent/Unit	Four Bedroom Asking Rent/Unit
Bayside Village	132 Marginal Way	Portland	2008	0.99	101	$2,636					101	1,200					$2,636
	17-25 Portland St	Portland	1900		9												
	8 Alder St	Portland	1949		10			10									
	10 Alder St	Portland	1910		2						2						
	38 Alder St	Portland			14												
89 Anderson	89 Anderson St	Portland	2016	1.89	53	$1,612	9	35	9			645	$1,430	$1,534	$2,097		
	131-139 Anderson St	Portland			5												
	55 Ashmont St	Portland			6												
Bayside Terrace	1 Bayside Ter	Portland	1980		24	$1,389			12	12		1,100			$1,299	$1,479	
	47 Boyd St	Portland	1915		9			3	6								
	14 Boynton St	Portland	1875		3	$803		2	1					$712	$985		
	55-57 Brackett St	Portland			6												
	59 Brackett St	Portland	1920		3												
	73 Brackett St	Portland			10												
	122-124 Brackett St	Portland			6												
	149 Brackett St	Portland			6			4	2								
West End Place	183 Brackett St	Portland	2015		39	$1,918		22	17			824		$1,652	$2,261		
	203 Brackett St	Portland	1889		6		2	4									
	262 Brackett St	Portland			6												
	285 Brackett St	Portland			14				14			1,000					
	299 Brackett St	Portland			6				4	2							
	303 Brackett St	Portland			5												
	311 Brackett St	Portland	1910		5			5									
	59 Bramhall St	Portland			9			9									
	25 Brattle St	Portland	1860		3					3							
PRINCETON VILLAGE APARTMENTS	220 Brighton Ave	Portland	1944	5.00	80	$1,044		80				466		$1,044			
	22 Carleton St	Portland			10												
	50-52 Carleton St	Portland			5		5										
	89-91 Carleton St	Portland	1900		6	$903		6						$903			
Shepley Apartments	18 Casco St	Portland	1900	1.61	62	$1,157	1	60	1			750	$1,004	$1,155	$1,458		
Ambassador Apartments	37 Casco St	Portland	1981	1.15	87	$875	87					503	$875				
	129-137 Chadwick St	Portland	1900	2.78	36												
	41 Chestnut St	Portland	1900		16			16				400					
	54 Chestnut St	Portland			11												
	92 Clark St	Portland	1864		4	$825		2	1	1				$716	$737	$1,133	
	146-148 Clark St	Portland			6												
	170-172 Clark St	Portland	1910		6	$963			6						$963		
Baxter Place	305 Commercial St	Portland	1903		62	$1,836		28	34			1,000		$2,282	$1,469		
	439 Congress St	Portland	1900	3.70	81	$1,094	41	40				644	$1,049	$1,140			
Congress Square	571-581 Congress St	Portland	1924		160	$1,253	7	136	17			656	$957	$1,249	$1,414		
Burnham Arms	633 Congress St	Portland	1900	2.22	45			45									
Lafayette Square	638-652 Congress St	Portland	1907	3.60	111			51	60			943					
645 Congress Apartments	643-649 Congress St	Portland	1963		56	$1,424	28	28				675	$1,244	$1,605			
Trelawny Building	655 Congress St	Portland		1.00	100	$1,082	40	30	30			732	$928	$1,128	$1,242		
Hiawatha	667 Congress St	Portland	2017	0.72	139	$1,651	34	97	8			588	$1,350	$1,690	$2,349		
	699 Congress St	Portland	1900		6			6									
	727 Congress St	Portland			8			2	6								
	773 Congress St	Portland	1910		5												
	775 Congress St	Portland			5												
	779 Congress St	Portland	1910		10			10									
	807 Congress St	Portland			6												
	817 Congress St	Portland			6												
	823 Congress St	Portland			6												
	829-831 Congress St	Portland	1910		6												
	835 Congress St	Portland			6												
	861 Congress St	Portland	1900		10	$728	1	7	2				$576	$704	$888		
	871-873 Congress St	Portland	1920		9				9								
	5 Crescent St	Portland			5												
Crescent Heights	25 Crescent St	Portland	2010		20					20		1,050					

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	223-225 Cumberland Ave	Portland			8												
	227-229 Cumberland Ave	Portland			3												
	235 Cumberland Ave	Portland			11												
	251 Cumberland Ave	Portland	1915		10			10				1,000					
	255 Cumberland Ave	Portland			10												
	263 Cumberland Ave	Portland			6												
	273 Cumberland Ave	Portland	1910		29												
	289-291 Cumberland Ave	Portland			5			4	1								
Earl Apartments	341 Cumberland Ave	Portland	1939		29	$1,061	5	23	1			729	$1,051	$1,051	$1,365		
	361 Cumberland Ave	Portland			7			7									
	363 Cumberland Ave	Portland	1910														
	367 Cumberland Ave	Portland	1915														
	385 Cumberland Ave	Portland	1900		6			6									
Back Bay Tower	401 Cumberland Ave	Portland	1989		116	$1,907		6	93	17		1,053		$1,500	$1,926	$1,946	
	409 Cumberland Ave	Portland	2015	1.75	57	$727	21	32	4			524	$691	$735	$848		
Burnham Towers Apartments	419 Cumberland Ave	Portland	1907	3.13	32												
	446-448 Cumberland Ave	Portland			6												
Cumberland Park Place	447 Cumberland Ave	Portland	1988	2.33	43			43				788					
	469 Cumberland Ave	Portland			6			6									
	471 Cumberland Ave	Portland	1900		13												
	477 Cumberland Ave	Portland	1889		10	$840		10						$840			
	484 Cumberland Ave	Portland			10												
Copeley Apartments	485 Cumberland Ave	Portland	1900		25	$742	12	13				547	$735	$747			
	486-488 Cumberland Ave	Portland			5												
	493 Cumberland Ave	Portland			6												
	497 Cumberland Ave	Portland			12												
	503 Cumberland Ave	Portland	1900		9	$867	1	8					$770	$867			
Park, Cumberland & Woodford	507 Cumberland Ave	Portland	1910		14					14		1,100					
Deering Place	510 Cumberland Ave	Portland	2020		75		11	40	11	13							
	515 Cumberland Ave	Portland	1910		6												
	523 Cumberland Ave	Portland			6												
	528 Cumberland Ave	Portland			5	$734	2	2	1				$669	$759	$814		
	531 Cumberland Ave	Portland			5												
	535 Cumberland Ave	Portland			7												
	541 Cumberland Ave	Portland	1900		6	$909		4	2			817		$820	$1,088		
	546 Cumberland Ave	Portland			2												
	549 Cumberland Ave	Portland		12.50	8	$906	6	1	1			669	$852	$995	$1,138		
	553 Cumberland Ave	Portland	1910		27	$998		24	3			622		$978	$1,164		
	556 Cumberland Ave	Portland			8												
	563 Cumberland Ave	Portland			11												
	571 Cumberland Ave	Portland			12												
	28-30 Cushman St	Portland			4			4									
53 Danforth Street	53 Danforth St	Portland	2009		43	$1,398		21	22			772		$1,239	$1,549		
	63 Danforth St	Portland			7			4	3			857					
	67-69 Danforth St	Portland			7		1	2	2	2		914					
	71-73 Danforth St	Portland			7												
	77 Danforth St	Portland			9												
	78 Danforth St	Portland			8			7	1			781					
Danforth on High	81 Danforth St	Portland	2014		30	$678	6	24				580	$645	$686			
	92 Danforth St	Portland			12												
	130-132 Danforth St	Portland			6												
	156 Danforth St	Portland			4												
	158 Danforth St	Portland			5												
	171 Danforth St	Portland			7												
	180 Danforth St	Portland			6												
	206-208 Danforth St	Portland			6												
	214-216 Danforth St	Portland	1900		6	$965			6						$965		
William and Dartmouth	202 Dartmouth St	Portland	1910		22	$1,409	2	14	6			826	$1,056	$1,299	$1,785		
	9 Deering Ave	Portland			7												

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	37 Deering Ave	Portland			5												
	46-48 Deering Ave	Portland			12			12									
	57 Deering Ave	Portland			6												
	514 Deering Ave	Portland			9			9									
	522 Deering Ave	Portland			5												
	528 Deering Ave	Portland			7												
	1-3 Deering St	Portland	1947		5												
	5-7 Deering St	Portland			6												
	9 Deering St	Portland			7												
	17 Deering St	Portland	1900		19												
	19 Deering St	Portland			5												
	26 Deering St	Portland			6												
	31 Deering St	Portland			7												
	33 Deering St	Portland			5												
	39 Deering St	Portland			5												
	44-46 Deering St	Portland	1900		5												
	47-49 Deering St	Portland			6												
	59 Deering St	Portland			6												
	64-66 Deering St	Portland			5												
	72-74 Deering St	Portland			7												
	9 Dow St	Portland			6												
	13 Dow St	Portland			8												
	17 Dow St	Portland			9												
	21 Dow St	Portland			6												
	25 Dow St	Portland			5												
	26 Dow St	Portland	1900		4	$684		2	1	1				$547	$711	$930	
	23 Ellsworth St	Portland			6												
	87 Emery St	Portland			6												
	91 Emery St	Portland			4												
	124 Emery St	Portland	1910		8			8									
	49 Falmouth St	Portland	1900														
Congress Square Plaza	12-18 Forest Ave	Portland	1900	1.25	160		7	136	17			566					
	100 Forest Ave	Portland	1910		5	$744	1	4					$649	$768			
Bayview Court Apartments	331-337 Forest Ave	Portland	1948		62	$909	30	30	2			685	$802	$978	$1,467		
	535 Forest Ave W	Portland			5												
Princeton on Back Cove	100 Forest Park	Portland	1944	5.00	220	$1,375		71	147	2		641		$1,200	$1,450	$2,027	
	12 Forest St	Portland			12												
	31-33 Frederic St	Portland	1910		5			4		1							
	10 Gilman St	Portland	1900		4			4									
	113 Gilman St	Portland			6												
	124 Glenwood Ave	Portland	1920														
	10-12 Grant St	Portland			11												
	11-13 Grant St	Portland	1900	9.09	11												
	17 Grant St	Portland			6												
	21 Grant St	Portland			6												
	24 Grant St	Portland			6												
	25 Grant St	Portland			7												
	27 Grant St	Portland			6												
	33 Grant St	Portland	1868		3					2	1						
	55 Grant St	Portland	1910		6			2	4								
	60 Grant St	Portland	1910		9		4	5				661					
	61-65 Grant St	Portland			9												
	69 Grant St	Portland			6												
	72 Grant St	Portland			6												
	72 A Grant St	Portland			12												
Prop Family Housing	77 Grant St	Portland	2005		16												
	80 Grant St	Portland	1910		13												
	84 Grant St	Portland	1998		6												
	85 Grant St	Portland	2005		16												

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	111-113 Grant St	Portland			6												
	122 Grant St	Portland			3												
	125 Grant St	Portland	1924		13			7	6			924					
	129 Grant St	Portland			6												
	133 Grant St	Portland	1900		19			15	4								
	141-143 Grant St	Portland	1910		22		2	10	10			673					
	142 Grant St	Portland			7												
	157-159 Grant St	Portland	1920	3.85	26	$993	10	8	8			769	$887	$901	$1,217		
	63-65 Gray St	Portland			10			10									
	11-15 Hanover St	Portland	1915		4			3		1							
	12 Hanover St	Portland			6												
	24 High St	Portland			14		14										
	28-30 High St	Portland	1910		7			7				1,464					
	40 High St	Portland			5												
	48 High St	Portland			10			10									
	51 High St	Portland			13		13										
	65 High St	Portland			9			7	2								
Elm Terrace	68 High St	Portland	1900		38	$755	6	22	10			695	$677	$723	$871		
	69 High St	Portland			11			11									
	78 High St	Portland			8												
	90 High St	Portland	1997		10												
	192 High St	Portland	1910		9			9									
	208-210 High St	Portland	1910		6	$1,078		2	4					$962	$1,136		
	212-214 High St	Portland	1900	10.00	10	$1,140		5	3	2		915		$1,007	$1,199	$1,381	
Ymca Apts	231 High St	Portland	2005	3.13	32												
	232 High St	Portland			6												
	236 High St	Portland	1915		6												
	237 High St	Portland	1850		11			6	2	3							
	241 High St	Portland			8		2	6									
	243-245 High St	Portland	1910		16			16									
	250 High St	Portland			11												
	138 Highland St	Portland	1910		6												
	4 Hill St	Portland	1900		16												
	7 Huntress St	Portland			10												
Kennedy Park	1 Kennedy Park	Portland	1971		178	$1,757			36	36	36	1,338			$1,287	$1,471	$1,698
	41 Mayo St	Portland															
Bayside Anchor	44 Mayo St	Portland	2017	2.08	48		48										
	24 Mellen St	Portland			8												
	30 Mellen St	Portland			7												
	83 Mellen St	Portland			6												
	90 Mellen St	Portland			6												
	44 Myrtle St	Portland			9												
	52 Myrtle St	Portland			6												
	53-55 Myrtle St	Portland	1947		5												
	137-139 Neal St	Portland	1910		17												
	161 Neal St	Portland			6												
Oak Street Lofts	70-82 Oak St	Portland	2012	2.70	37		37					400					
Bay View Apartments	104 Oak St	Portland	1940		20												
	255 Oxford St	Portland	1910		17	$615		15		2				$567		$974	
	22 Park Ave	Portland			8												
	76 Park Ave	Portland			6												
	82 Park Ave	Portland			6												
	84 Park Ave	Portland	1910		6				3	3		1,100					
Burnham Parkside Apartments	88 Park Ave	Portland			6	$1,306			6						$1,306		
Burnham Parkside Apartments	94 Park Ave	Portland	1900		16	$1,347		8	8					$1,208	$1,487		
	120 Park Ave	Portland	1914		21			18	3			629					
	122-124 Park Ave	Portland	1914		20			10	10			915					
	128 Park Ave	Portland	1900	5.00	20	$816	10	10				600	$809	$823			
	130 Park Ave	Portland			6												

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	138 Park Ave	Portland	1910		6					6							
Parkside Portland Apartments	142 Park Ave	Portland	1900		12				12			650					
	196 Park Ave	Portland	1874		11				11								
Iris Park	198 Park Ave	Portland	2006	3.33	30												
	198 Park Ave	Portland	1910		8	$772		2	6			800		$991	$699		
	200 Park Ave	Portland			6												
	208 Park Ave	Portland			4												
	216-218 Park Ave	Portland			14												
	274 Park Ave	Portland			6			6									
	278-280 Park Ave	Portland			6	$981			6			950			$981		
	22 Park St	Portland			7												
	51 Park St	Portland			12												
	85 Park St	Portland			5												
	100 Park St	Portland			8												
	112 Park St	Portland			5	$2,799		2	3			900		$2,512	$2,990		
	114 Park St	Portland			5												
	129-131 Park St	Portland	1900	1.82	55		20	35				590					
	140 Park St	Portland	1900		19												
	158 Pearl St	Portland			10												
	180 Pearl St	Portland	2007		60			20	25	15							
Pearl Place II	184 Pearl St	Portland	2013	1.85	54	$831		26	17	11		831		$729	$874	$1,006	
	20 Pine St	Portland			6												
	35 Pine St	Portland			3												
	59 Pine St	Portland	1915		12			12									
	68 Pine St	Portland	1905		6												
Butler Payson Apartments	77 Pine St	Portland	1900		39			19	20								
	114 Pine St	Portland			12												
	119 Pine St	Portland	1908		4			3		1							
	130 Pine St	Portland			6												
	138-140 Pine St	Portland			5												
	12 Pitt St	Portland	1910		12	$1,229			12			950			$1,229		
	35 Pleasant St	Portland	1910		8			4	4								
The Wadsworth	28-30 Preble St	Portland	1900	3.13	64	$992	30	34				419	$895	$1,079			
117 Lofts	117 Preble St	Portland		1.82	55	$1,192	55					420	$1,179	$1,560			
	479-481 Saint Johns St	Portland	1925		3												
	8 Salem St	Portland			9												
Danforth Heights	48 Salem St	Portland	1973		166	$1,173		25	111	20	10	761		$933	$1,134	$1,489	$1,565
	23 Saunders St	Portland	1910		5			5									
Shepley Street Housing	15 Shepley St	Portland	1910		20		10		10								
	1-3 Sherman St	Portland			10												
	8-10 Sherman St	Portland			5												
	11 Sherman St	Portland			10			10									
	22-24 Sherman St	Portland	1910		6			6									
	27 Sherman St	Portland			6												
	31 Sherman St	Portland			6												
	52 Sherman St	Portland		33.33	6	$1,097		4	2			782		$1,002	$1,287		
	55 Sherman St	Portland			5												
	56 Sherman St	Portland			7			7									
	60 Sherman St	Portland			6			6									
	66 Sherman St	Portland			5												
	69 Sherman St	Portland			12												
	75 Sherman St	Portland			9			7	2								
	77-79 Sherman St	Portland			6												
	108 Sherman St	Portland	1900		8			2	6								
	111 Sherman St	Portland	1900		25	$1,184		25				600		$1,184			
	115 Sherman St	Portland			6												
	119 Sherman St	Portland			13												
	123 Sherman St	Portland			13												
	131 Sherman St	Portland			6												

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	141 Sherman St	Portland			6												
Midtown	105 Somerset St	Portland	2021		450												
	120 Spring St	Portland	1910		3	$831			3						$831		
Carleton Court	145 Spring St	Portland	1900		21			5	10	6		999					
	197 Spring St	Portland			8												
	204 Spring St	Portland			4												
	257 Spring St	Portland			11												
	262 Spring St	Portland			7												
	265-267 Spring St	Portland			8												
	271 Spring St	Portland	1885		5	$831		5						$831			
	277 Spring St	Portland			5												
	291 Spring St	Portland			9												
	295 Spring St	Portland	1977		6												
Spring Street Apartments	314 Spring St	Portland	1900		19												
76 Spruce St, Portland, ME	76 Spruce St	Portland			6			6									
	460 St John St	Portland			6												
	463 St John St	Portland			5												
	548-550 St John St	Portland			1												
	21 State St	Portland	1923		7												
	27-29 State St	Portland	1800		10												
	31-35 State St	Portland	1920		10			10									
	32 State St	Portland	1900		8												
Casco Terrace	41 State St	Portland	2003		27	$1,653		18	9			397		$1,291	$2,375		
	45-47 State St	Portland	1900		7				7			1,041					
	51 State St	Portland	1900		15		8	7				618					
	54 State St	Portland			7												
	59 State St	Portland	1920	1.79	56	$1,360		56				800		$1,360			
	62 State St	Portland	1900		25		8	12	5			608					
	91 State St	Portland	1910		7		1	6									
100 State Street Apartments	100 State St	Portland	1978		169	$1,117		148	21			653		$1,095	$1,275		
	125 State St	Portland			9												
	131 State St	Portland			9												
	169-171 State St	Portland	1900		10				10								
	173 State St	Portland			10												
	177 State St	Portland			7												
	201 State St	Portland			6												
Longfellow Commons	206 State St	Portland	1970		20			10	10			915					
John W. Munger Block	207-209 State St	Portland			6												
	218 State St	Portland	1900		17			9	8			868					
Northgate Apartments	231 State St	Portland	1931		31	$969		31				600		$969			
	235 State St	Portland			6												
	261 State St	Portland	1910		7			7									
Charles Tobin House	264 State St	Portland	1887		13			13									
	272 State St	Portland			8												
	279 State St	Portland			7												
	286-288 State St	Portland	1908	3.85	26	$1,404		5	21			631		$1,272	$1,435		
	287-289 State St	Portland			6												
Unity Village at Bayside	6 Stone St	Portland	2000		23												
	210 Valley St	Portland	1899		4			4									
	5 Weymouth St	Portland			8												
	8 Weymouth St	Portland			7												
	12 Weymouth St	Portland	1910		26												
	16 Weymouth St	Portland			6												
	19 William St	Portland	1915		3				1	2							
	24 William St	Portland			5												
	48 Wilmot St	Portland			10		10										
	82 Winter St	Portland	1840		4	$888		3	1					$777	$1,221		
	86 Winter St	Portland			4			3	1								
	94 Winter St	Portland	1900		10			8	2								

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	117 Winter St	Portland			5												
	119 Winter St	Portland			5												
	102-106 Woodford St	Portland	1930		7	$1,043			6	1		1,077			$1,015	$1,213	
	165 Woodford St	Portland	1910		8					8		1,100					
	167 Woodford St	Portland	1910		6			6									
	168-170 Woodford St	Portland			9												
	180 Woodford St	Portland			8												
	221 Woodford St	Portland			9			9									
Plymouth Court Apartments	244 Woodford St	Portland	1920	5.26	19			19				750					
	252 Woodford St	Portland			7		4	3				664					
	278 Woodford St	Portland		7.14	14												
	286 Woodford St	Portland			3												
	296 Woodford St	Portland			3												
	127 York St	Portland			12												
	153-155 York St	Portland			4												
	191-193 York St	Portland			12		1	7	4								

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Description:
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Date Range: 4/1/2019 12:00:00 AM - 4/21/2019 11:59:00 PM
Total Respondents: 895

Q1. What is your current enrollment status?

Count	Percent	
785	87.71%	Full time matriculated (taking 12 or more credit hours for undergrad students / 9 or more hours for grad students)
110	12.29%	Part time matriculated (fewer than 12 credit hours for undergrad students / fewer than 9 credit hours for grad students)
0	0.00%	Non-matriculated (a non-degree student; taking classes but not formally admitted to USM)
895	Respondents	

Q2. What degree are you pursuing?

Count	Percent	
747	83.46%	Bachelor
102	11.40%	Master/professional
35	3.91%	Law
5	0.56%	PhD
1	0.11%	Certificate
0	0.00%	I am not currently pursuing a degree
5	0.56%	Other (please specify)

Count	Percent	
1	20.00%	Accelerated Law Degree
1	20.00%	Associate
1	20.00%	Linguistics
1	20.00%	Tourism and Hospitality

895 Respondents

Q3. What is your current class standing?

Count	Percent	
161	22.33%	Freshman year of undergraduate program (completed fewer than 24 credit hours)
162	22.47%	Sophomore year of undergraduate program (completed 24 to 53 credit hours)
183	25.38%	Junior year of undergraduate program (completed 54 to 83 credit hours)
215	29.82%	Senior or fifth year of undergraduate program (completed 84 or more credit hours)
721	Respondents	

Q4. What is your current class standing?

Count	Percent	
60	43.48%	First year of graduate/professional/law/doctorate program
42	30.43%	Second year of graduate/professional/law/doctorate program
21	15.22%	Third year of graduate/professional/law/doctorate program
10	7.25%	Fourth year or beyond of graduate/professional/law/doctorate program
5	3.62%	Other (please specify)

Count	Percent	
1	20.00%	1L

1	20.00%	3rd year of bachelor
1	20.00%	ETEP 1 year intern
1	20.00%	Sophomore
1	20.00%	Third year of SBS undergraduate on the MOT track, starting graduate studies in the fall

138 Respondents

Q5. In which of the following colleges or schools are you enrolled?

Count	Respondent %	Response %	
84	9.88%	9.07%	College of Arts, Humanities, and Social Sciences - Fine Arts
68	8.00%	7.34%	College of Arts, Humanities, and Social Sciences -Humanities
97	11.41%	10.48%	College of Arts, Humanities, and Social Sciences -Social Sciences
8	0.94%	0.86%	College of Arts, Humanities, and Social Sciences - Interdisciplinary
94	11.06%	10.15%	College of Management and Human Service - Business
55	6.47%	5.94%	College of Management and Human Service - Education and Human Development
25	2.94%	2.70%	College of Management and Human Service - Muskie Public Service
39	4.59%	4.21%	College of Management and Human Service - Social Work
2	0.24%	0.22%	College of Management and Human Service - Interdisciplinary
97	11.41%	10.48%	College of Science, Technology, and Health - Life Sciences
108	12.71%	11.66%	College of Science, Technology, and Health - School of Nursing
80	9.41%	8.64%	College of Science, Technology, and Health - Physical Sciences
19	2.24%	2.05%	Lewiston-Auburn College - Lewiston-Auburn College
34	4.00%	3.67%	University of Maine School of Law - Law Degree Program
3	0.35%	0.32%	Women's Studies - Women's Studies Program
1	0.12%	0.11%	GO Program - GO Program
28	3.29%	3.02%	Undeclared - Undeclared Program
1	0.12%	0.11%	Non-Degree (excluding certificate programs) - Non-Degree
83	9.76%	8.96%	Other (please specify)

Count	Percent	
1	1.20%	Biology degree
1	1.20%	business administration
1	1.20%	CMS
1	1.20%	college of art, but in process of moving to exercise science
1	1.20%	College of Arts, Humanities, and Social Sciences - Criminology
1	1.20%	College of Business
1	1.20%	College of Music- Musical theater program
1	1.20%	College of Science, Technology and Health - Computer Science
1	1.20%	College of Science, Technology, and Health - Cyber Security
1	1.20%	Communication Major
1	1.20%	communications
3	3.61%	Communications
4	4.82%	Computer Science
1	1.20%	Department of Biological Sciences
1	1.20%	Don’t know
1	1.20%	Double major psych nursing and minor in bio

1	1.20%	Economics
1	1.20%	engineering
2	2.41%	Engineering
1	1.20%	Environmental policy
1	1.20%	ETEP
1	1.20%	Finance
1	1.20%	Health Sciences (Pre-Professional)
1	1.20%	IT
1	1.20%	IT program
2	2.41%	Leadership Studies
6	7.23%	Linguistics
1	1.20%	Media Communications
1	1.20%	MPPM
2	2.41%	Music Education
1	1.20%	Muskie School of Business
1	1.20%	occupational therapy
1	1.20%	Political science
1	1.20%	Political Science,
1	1.20%	psychology
4	4.82%	Psychology
1	1.20%	Public health
1	1.20%	Public Health
1	1.20%	Recreation and leisure studies
1	1.20%	School of Business - Accounting Major
4	4.82%	School of Music
1	1.20%	Social work
1	1.20%	STEM Self - Design K-8
2	2.41%	Stonecoast MFA
1	1.20%	TAH
1	1.20%	Technical Management in Precision Machining Technology
1	1.20%	Technology
1	1.20%	Undergraduate elementary education
2	2.41%	University of Southern Maine
1	1.20%	University of southern Maine
1	1.20%	Unsure which linguistics falls under
2	2.41%	USM
1	1.20%	USM- Matsters program in Leadership Studies
1	1.20%	USM- Media Studies
1	1.20%	USM School of Music
1	1.20%	USM special education Masters degree.

850 Respondents

926 Responses

Q6. Do you consider yourself a transfer student?

Count Percent

616	71.54%	No, I started pursuing my current degree at USM
109	12.66%	Yes, I started pursuing my current degree at a community or technical college
122	14.17%	Yes, I started pursuing my current degree at a 4-year college or university
14	1.63%	Other (please specify)

Count	Percent	
1	7.14%	2nd degree
1	7.14%	Both 4-year university & community college experience.
1	7.14%	Dual enrollment
1	7.14%	I finished a degree at a 4 yr university, this is my 2nd
1	7.14%	I have block credit from a degre at a 4-year college
1	7.14%	Military
1	7.14%	This is my second bachelors degree, I attended a private university previously
1	7.14%	Transfer back into the USM School
1	7.14%	undecided
1	7.14%	Went to UMaine, did first year of Law in Charleston, SC.
1	7.14%	Working professional w/ degrees from other universities, seeking another at USM.
1	7.14%	Yes, I started pursuing a different degree at a different university
1	7.14%	Yes, pursuing a second Bachelor's Degree
1	7.14%	Yes-transfer from USM to USM, I have one degree from USM that transferred into another 4-year degree at USM

861 Respondents

Q7. Which best describes your permanent residence prior to attending USM?

Count	Percent	
148	17.15%	Portland metropolitan area
240	27.81%	Elsewhere in Cumberland or York County (excluding Portland metro area)
271	31.40%	Elsewhere in Maine (excluding Cumberland and York County)
50	5.79%	New Hampshire
88	10.20%	Elsewhere in New England (excluding Maine and New Hampshire)
47	5.45%	Elsewhere in the United States (excluding New England)
19	2.20%	International

863 Respondents

Q8. What were the primary factors in your decision to attend USM?

Count	Percent	
206	24.73%	USM offered courses or programs specific to my academic interest(s)
84	10.08%	USM is close to where my family/parent(s) lives
72	8.64%	USM's proximity to my family/parent(s)'s home allows me to commute to campus and save money on housing
30	3.60%	USM is close to my work and allows me to take classes around my work schedule
50	6.00%	USM's proximity to the Portland metropolitan area
28	3.36%	USM was recommended to me by friends/family
19	2.28%	USM/my program/my academic advisor has a strong reputation
254	30.49%	The overall affordability of USM (including stipend/scholarships/grants)
9	1.08%	The residential and/or student life experience at USM
20	2.40%	The networking, internship, and job opportunities afforded by USM's location, faculty, and/or alumni

12	1.44%		I did not want to go to USM and anticipate transferring to another institution
49	5.88%		Other (please specify)

Count	Percent		
1	2.04%		Cheap
1	2.04%		"What were" specifies that you can select multiple choices. Either rephrase or change selection
1	2.04%		Affordability and close proximity to home.
1	2.04%		affordability plus radio station
1	2.04%		Army ROTC Program and Nursing Program
1	2.04%		Athletic
3	6.12%		Athletics
1	2.04%		because of sports
2	4.08%		Cheap
1	2.04%		Cheaper cost than the other schools I got accepted to
1	2.04%		close to home, affordable, and offered the degree that I'm pursuing
1	2.04%		close to my significant other
1	2.04%		Friends also go here
1	2.04%		Had my program and was somewhat affordable
1	2.04%		Had tennis team and I like snow
1	2.04%		Heidi's immense kindness and the general positivity I incurred when I visited the campus.
1	2.04%		home, in state tuition & specific degree, also accepted nearly all of my transfer credits from other institutions
1	2.04%		I am from Maine originally
1	2.04%		I just decided too
1	2.04%		Ice Hockey
2	4.08%		It was the cheapest
1	2.04%		Military transfer, closest available with degree offered
1	2.04%		Money
1	2.04%		My employer pays for my degree and my classes meet near my empoyer's district.
1	2.04%		My family has come to usm for 2/3 generations
1	2.04%		my wife was an employee of the UMaine system.
1	2.04%		NCAA
1	2.04%		Only law school in Maine
1	2.04%		Open Admissions
1	2.04%		opportunity to play a sport
1	2.04%		proximity to home, affordability and excellent degree program
1	2.04%		Rotc
1	2.04%		Small
3	6.12%		Sports
1	2.04%		Sports team
1	2.04%		strong military presence
1	2.04%		There are many, but this survey tool does not allow for multiple response entry.
1	2.04%		Tuition & Enrollment
1	2.04%		unable to get into the nursing program at a community college
1	2.04%		USM Athletics

1	2.04%		USM had the only law school in the state.
833	Respondents		

Q9. How important was the availability of on-campus housing in your decision to attend USM?

Count	Percent	
377	45.15%	Very important
131	15.69%	Important
186	22.28%	Unimportant
141	16.89%	Very unimportant
835	Respondents	

Q10. In the 2018-19 academic year, were you a student-athlete on any USM athletics teams?

Count	Percent	
704	85.85%	No
116	14.15%	Yes
820	Respondents	

Q11. Where were the majority of your academic activities (classes, labs, etc.) located during the 2018-19 academic year?

Count	Percent	
527	63.96%	USM Portland campus
196	23.79%	USM Gorham campus
14	1.70%	USM Lewiston-Auburn campus
57	6.92%	Primarily blended (at least 50% online as well as on-campus instruction)
30	3.64%	Primarily on-line
824	Respondents	

Q12. Where do you currently live?

Count	Percent	
343	43.09%	Student housing on USM's Gorham campus
453	56.91%	Off campus
796	Respondents	

Q13. Which of the following factors had the greatest influence on your decision of where to live during the 2018-19 academic year? (Select up to five responses)

Count	Respondent %	Response %	
509	64.35%	23.02%	Affordability (including the cost of rent, utilities, parking, and other housing-related expenses)
196	24.78%	8.86%	Availability of the unit-type configuration I desire (suite-style, studio apartment, 1-bed apartment, 2-bed apartment, etc.)
360	45.51%	16.28%	Proximity to campus and on-campus resources
87	11.00%	3.93%	Proximity to retail, dining, and grocery options
103	13.02%	4.66%	Proximity to other students/ability to informally connect with other residents
38	4.80%	1.72%	Proximity to local nightlife/entertainment
143	18.08%	6.47%	Proximity to my work/internship/volunteer position
149	18.84%	6.74%	Proximity to my friends or family
18	2.28%	0.81%	Availability of a child-friendly living arrangement
79	9.99%	3.57%	Availability of a pet-friendly living arrangement
39	4.93%	1.76%	Quality of community amenities (e.g. fitness center, parking garage, building

			laundry facilities, etc.)
74	9.36%	3.35%	Quality of unit amenities (e.g. in-unit laundry, walk-in closets, spacious layout, etc.)
45	5.69%	2.04%	Flexible lease/rental terms
98	12.39%	4.43%	Availability of a quiet place to study
75	9.48%	3.39%	Access to dedicated resident parking adjacent to my unit
39	4.93%	1.76%	Availability of safety and security features in my unit/building
28	3.54%	1.27%	Aesthetic architectural features (look or feel of interior and exterior spaces, newer building, historical building, etc.)
6	0.76%	0.27%	ADA accessibility
53	6.70%	2.40%	Desirability of the neighborhood/location
72	9.10%	3.26%	Other (please specify)

Count	Percent	
1	1.39%	Academic
1	1.39%	Already established at current residence
1	1.39%	already lived in Portland
1	1.39%	Already own a home in area
1	1.39%	Already own a home in topsham
1	1.39%	being a student athlete
1	1.39%	Being able to get a room. It was not a matter of any of these things the most influential thing for my living situation was being able to have a room and having options. It was a lot of stress to not be guarenteed a dorm room on-campus.
1	1.39%	Cheaper than living on campus
1	1.39%	Close to classes
1	1.39%	Close to my current home
1	1.39%	Close to my internship site
1	1.39%	Did not need campus housing due to owning home in Portland.
1	1.39%	Family
1	1.39%	Freshman housing, I didn’t have a choice where I ended up
1	1.39%	Honestly its all about balancing the price and the type of space students need. It's so sad to see students who are juniors and upperclassman being placed into triples and or not having the options to spaces. Triples are not good for mental health and its sad that many students go into triples to save money because housing on campus should be somewhat more desirable due to the fees payed etc. It would be nice to see the tripled rooms stop like apartments or and more spaces set up like suites put in. This would allow students a since of private space and the ability to prepare for later on renting experiences while being provided the affordability they should on campus. Its hard to see USM more looking into a name change then care about the mental health and idea from CURRENT students. We are the ones paying now yet we won't get to see the changes until we are gone.
1	1.39%	housing that accommodates my relationship
1	1.39%	I already own a home
1	1.39%	I am a non-traditional student. I live in my home that I purchased and continue to teach in my district.
1	1.39%	I didn’t apply in time to live on campus.
1	1.39%	I didn’t choose
1	1.39%	I have two kids and as far as I am aware that leaves me no option other thqn to live off-campus
1	1.39%	i live in Portland already, I'm a grad student
1	1.39%	I own a home
1	1.39%	I own a home and have a child. I am a nontraditional adult student
1	1.39%	I own a home and the location of school isn't out of the way

1	1.39%		I own a home, so that's where I had to live with my family
1	1.39%		I own a home.
1	1.39%		I own a house
1	1.39%		I own my home
1	1.39%		I own my home and don't want to sell.
1	1.39%		I owned a home
1	1.39%		I was unable to find my own apartment at the beginning of the 18-19 school year. Three months after the semester started, I was growing increasingly upset with the housing situation. I quickly moved out and found my own apartment.
1	1.39%		I'm from Colorado, so living on campus was a very good option
1	1.39%		I'm living on campus
1	1.39%		It was an emergency type situation: my previous roommate decided they didn’t want to live with me.
1	1.39%		It's a waste of time and money to be at the dorms in gorham when all my classes are in portland.
1	1.39%		It's my home, I went to USM so I didn't have to move
1	1.39%		It's my mother's house
1	1.39%		Limited housing on campus
1	1.39%		Live with parents, can't move out until I graduate due to affordability
1	1.39%		Living on campus was my ONLY option
1	1.39%		Married and already permanently housed
1	1.39%		money
1	1.39%		On campus does not offer Summer months so I dont wanted to move twice a year!!!
1	1.39%		On campus housing allows me to use financial aid for housing which is the only way that I could possibly afford it
1	1.39%		Only option
1	1.39%		Out of State
1	1.39%		Own a house, with kids that do and have attended a particular school system
1	1.39%		own home
1	1.39%		Own my home
1	1.39%		own my home nearby
1	1.39%		Owned home and did not want to move for a 15 month program
1	1.39%		RA
1	1.39%		Ra job
1	1.39%		RA role
1	1.39%		Restricted dining hall (I have celiacs, and the dorms are dated and communal showers gross me out
1	1.39%		Space away from home
1	1.39%		Sports
1	1.39%		Student Employee - LRA
1	1.39%		There were no available housing except another freshman dorm which I did not want to be in again
1	1.39%		Too far from home
1	1.39%		Transportation (Husky bus)
1	1.39%		USM doesn't offer graduate housing.
1	1.39%		USM was too crowded so I moved off campus. It was awful
1	1.39%		wanted to live with my partner

1	1.39%		wasn't many options
1	1.39%		Wasn’t excited to live on campus but couldn’t afford an apartment and wasn’t close enough to home to commute.
1	1.39%		Working professional, bought a house in a neighborhood I liked.
1	1.39%		Your housing is really bad though.

791 Respondents

2211 Responses

Q14. Which years have you lived on campus? (Select all that apply, including partial years)

Count	Respondent %	Response %		
307	39.26%	26.79%		None
392	50.13%	34.21%		Freshman year of undergraduate program (completed fewer than 24 credit hours)
257	32.86%	22.43%		Sophomore year of undergraduate program (completed 24 to 53 credit hours)
128	16.37%	11.17%		Junior year of undergraduate program (completed 54 to 83 credit hours)
50	6.39%	4.36%		Senior or fifth year of undergraduate program (completed 84 or more credit hours)
4	0.51%	0.35%		First year of graduate/professional/law/doctorate program
3	0.38%	0.26%		Second year of graduate/professional/law/doctorate program
2	0.26%	0.17%		Third year of graduate/professional/law/doctorate program
3	0.38%	0.26%		Fourth year or beyond of graduate/professional/law/doctorate program

782 Respondents

1146 Responses

Q15. Do you currently have a USM Meal Plan?

Count	Percent		
473	60.33%		No, I do not have a meal plan
159	20.28%		Yes, 10 Meal/$300 Husky Bucks Plan
125	15.94%		Yes, 14 Meal/$175 Husky Bucks Plan
27	3.44%		Yes, 19 Meal/$50 Husky Bucks Plan

784 Respondents

Q16. Where do you live on campus?

Count	Percent		
52	15.81%		Anderson Hall
64	19.45%		Philippi Hall
38	11.55%		Robie Andrews Hall
70	21.28%		Upton Hastings Hall
28	8.51%		Woodward Hall
77	23.40%		Upperclass Hall

329 Respondents

Q17. In what kind of housing configuration do you live?

Count	Percent	
211	63.17%	Traditional unit (combined bedroom and living area in one unit, shared floor bathroom - available in Anderson Hall, Philippi Hall, Robe Andrews Hall, Upton Hastings Hall, and Woodward Hall)
89	26.65%	Suite-style unit (one unit with two to four bedrooms and private living area and bathroom - available in Philippi Hall and Upperclass Hall)
34	10.18%	Apartment-style unit (one unit with four bedrooms, two private bathrooms, a living area, and a kitchen - available in Upperclass Hall)
334	Respondents	

Q18. What is your bedroom occupancy?

Count	Percent	
92	27.30%	Single (private bedroom)
165	48.96%	Double (bedroom shared with one other person)
80	23.74%	Triple (bedroom shared with two other people)
337	Respondents	

Q19. Please provide the zip code of your current residence while attending USM:

Count	Percent
420	100.00%

Count	Percent	
2	0.48%	03801
1	0.24%	03827
1	0.24%	03851
1	0.24%	03867
1	0.24%	03870
1	0.24%	03885
1	0.24%	03901
1	0.24%	03903
1	0.24%	03904
1	0.24%	03905
1	0.24%	03906
3	0.71%	04002
15	3.57%	04005
2	0.48%	04009
2	0.48%	04010
4	0.95%	04011
1	0.24%	04013
2	0.48%	04015
1	0.24%	04017
2	0.48%	04021
2	0.48%	04027
2	0.48%	04029
2	0.48%	04030
4	0.95%	04032
1	0.24%	04037

16	3.81%	04038
1	0.24%	04039
1	0.24%	04042
4	0.95%	04043
2	0.48%	04049
2	0.48%	04055
1	0.24%	04061
1	0.24%	04061-4733
6	1.43%	04062
1	0.24%	04063
13	3.10%	04064
1	0.24%	04068
3	0.71%	04071
17	4.05%	04072
1	0.24%	04073
23	5.48%	04074
1	0.24%	04074-8407
1	0.24%	04079
10	2.38%	04084
1	0.24%	04085
2	0.48%	04086
1	0.24%	04090
20	4.76%	04092
11	2.62%	04093
4	0.95%	04096
2	0.48%	04097
42	10.00%	04101
27	6.43%	04102
57	13.57%	04103
1	0.24%	04104
8	1.90%	04105
25	5.95%	04106
5	1.19%	04107
2	0.48%	04110
3	0.71%	04210
1	0.24%	04222
2	0.48%	04236
1	0.24%	04239
11	2.62%	04240
2	0.48%	04250
2	0.48%	04252
1	0.24%	04253
1	0.24%	04256
3	0.71%	04260

1	0.24%	04261
1	0.24%	04268
3	0.71%	04274
1	0.24%	04276
2	0.48%	04280
1	0.24%	04282
1	0.24%	04294
1	0.24%	04330
2	0.48%	04345
1	0.24%	04364
2	0.48%	04543
1	0.24%	04555
2	0.48%	04579
1	0.24%	04605
1	0.24%	04679
2	0.48%	04901
1	0.24%	04963
1	0.24%	12077

420 Respondents

Q20. Using the map provided below, which area of Portland best describes the location of your current housing situation?

Count	Percent	
276	62.73%	I live outside of the City of Portland boundary
11	2.50%	Back Cove
15	3.41%	Deering Center
6	1.36%	Downtown
7	1.59%	East Deering
6	1.36%	East Bayside
14	3.18%	East End
1	0.23%	India St.
5	1.14%	Libbytown
3	0.68%	Nason's Corner
13	2.95%	North Deering
13	2.95%	Oakdale
12	2.73%	Parkside
8	1.82%	Riverton
3	0.68%	Rosemont
3	0.68%	Stroudwater
2	0.45%	Valley St.
3	0.68%	West Bayside
13	2.95%	West End
26	5.91%	Other neighborhood within the boundary of the City of Portland (please specify)

Count	Percent	
1	3.85%	Biddeford

1	3.85%	Gardiner
1	3.85%	Gorham
1	3.85%	GORHAM
1	3.85%	I do not live in Ptld
1	3.85%	I don’t live in Portland.
1	3.85%	Naples
1	3.85%	Near Falmouth
1	3.85%	Old Orchard Beach
1	3.85%	poland
1	3.85%	Portsmouth
4	15.38%	Scarborough
1	3.85%	South Portland
1	3.85%	south portland- knightsville
1	3.85%	westbrook
4	15.38%	Westbrook
1	3.85%	Willard square area
1	3.85%	Windham
1	3.85%	Woodford Corner

440 Respondents

Q21. With whom do you currently live?

Count	Percent	
41	9.30%	I live alone
124	28.12%	I live with my parent(s) or other relative(s)
115	26.08%	I live with my spouse/partner
17	3.85%	I live with my child(ren)/dependent(s)
22	4.99%	I live with my spouse/partner and child(ren)/dependent(s)
55	12.47%	I live with other USM student(s)
43	9.75%	I live with roommate(s) who do not attend USM
19	4.31%	I live with both USM students and roommate(s) that do not attend USM
5	1.13%	Other (please specify)

Count	Percent	
1	20.00%	I live with my spouse and child
1	20.00%	My mother and girlfriend
1	20.00%	my sister
1	20.00%	rent a room out of a house
1	20.00%	spouse/usm student

441 Respondents

Q22. Which best describes your current housing situation?

Count	Percent	
44	10.00%	Rent individual bedroom within a house
182	41.36%	Rent apartment/condo unit within a house or complex
30	6.82%	Rent an entire house
6	1.36%	Don't pay rent for an apartment/condo unit owned by myself or spouse

16	3.64%		Don't pay rent for an apartment/condo unit owned by another person
36	8.18%		Don't pay rent for an entire house owned by myself or spouse/partner
82	18.64%		Don't pay rent for an entire house owned by another person
44	10.00%		Other (please specify)

Count	Percent		
1	2.27%		Contribute to mortgage for entire house owned by partner
1	2.27%		Do not pay rent, family lake house
1	2.27%		Don’t pay rent for apartment owned by parents
1	2.27%		Help my mom pay rent
1	2.27%		house with a mortgage
1	2.27%		I don't pay rent/live with parents
1	2.27%		i live in a room with my grandmother
1	2.27%		I live in a winter rental because its all I can afford and have to move out for the summer to my parents house.
1	2.27%		I own a home
1	2.27%		I own my own home
1	2.27%		I own my own house
1	2.27%		Live at home with parents
1	2.27%		Live at Saint Joseph’s Rehabilitation and Residence through their inter generational program
1	2.27%		live in owned home
1	2.27%		living with my parents
1	2.27%		mortgage
1	2.27%		Own
2	4.55%		Own a home
1	2.27%		Own a home with my spouse
1	2.27%		Own entire house
1	2.27%		own home
1	2.27%		Own home
1	2.27%		Own Home
1	2.27%		own house
1	2.27%		Own House
1	2.27%		Own my home
1	2.27%		Own my house
1	2.27%		Own my own home- mortgage free!
1	2.27%		own pay a mortgage
1	2.27%		owner-occupied three unit
1	2.27%		Pay a mortgage on a house loan
1	2.27%		Pay low rent to my aunt to live in her condo
1	2.27%		pay mortgage for our home
1	2.27%		Pay mortgage for the house
1	2.27%		Pay to live at home
1	2.27%		rent a room in a condo
1	2.27%		Rent an efficiency
1	2.27%		Rent apartment

1	2.27%		Share costs with family in single family house
1	2.27%		Spilit apartment rent w/ gf, techincally
1	2.27%		We pay a mortgage

440 Respondents

Q23. How do you think your current living experience compares to living on the Gorham campus?

Count	Percent		
234	53.18%		My off-campus experience is much better
64	14.55%		My off-campus experience is somewhat better
18	4.09%		My off-campus experience is about the same
13	2.95%		My off-campus experience is somewhat worse
5	1.14%		My off-campus experience is much worse
106	24.09%		Unsure
440	Respondents		

Q24. With how many people do you share your living unit?

Count	Percent		
120	48.58%		One person
62	25.10%		Two people
42	17.00%		Three people
23	9.31%		Four or more people
247	Respondents		

Q25. Do you share your bedroom with any other people?

Count	Percent		
149	58.20%		No
4	1.56%		Yes, with one or more non-familial people (roommate)
103	40.23%		Yes, with one or more members of my family and/or my significant other
256	Respondents		

Q26. Do you share your bathroom with any other people?

Count	Percent		
47	18.36%		No
97	37.89%		Yes, with one or more non-familial people (roommate)
112	43.75%		Yes, with one or more members of my family and/or my significant other
256	Respondents		

Q27. Do you share a kitchen with any other people?

Count	Percent		
29	11.42%		No
107	42.13%		Yes, with one or more non-familial people (roommate)
118	46.46%		Yes, with one or more members of my family and/or my significant other
254	Respondents		

Q28. What is your personal share of monthly rent/housing costs excluding utilities?		
Count	Percent	
6	2.34%	Not applicable; I do not pay rent
6	2.34%	Less than $200
10	3.91%	$200 - $299
19	7.42%	$300 - $399
45	17.58%	$400 - $499
53	20.70%	$500 - $599
47	18.36%	$600 - $699
25	9.77%	$700 - $799
15	5.86%	$800 - $899
8	3.13%	$900 - $999
5	1.95%	$1,000 - $1,099
4	1.56%	$1,100 - $1,199
4	1.56%	$1,200 - $1,299
2	0.78%	$1,300 - $1,399
1	0.39%	$1,400 - $1,499
2	0.78%	$1,500 - $1,599
2	0.78%	$1,600 - $1,699
1	0.39%	$1,700 - $1,799
0	0.00%	$1,800 - $1,899
0	0.00%	$1,900 - $1,999
0	0.00%	$2,000 or more
1	0.39%	I don't know
256	Respondents	

Q29. In addition to your rent, for which of the following utilities do you currently pay? (Select all that apply)			
Count	Respondent %	Response %	
0	0.00%	0.00%	Not applicable; I do not pay rent
39	15.42%	5.82%	None, utilities are included in the rent
66	26.09%	9.85%	Cable/satellite television
175	69.17%	26.12%	Electric
79	31.23%	11.79%	Gas
178	70.36%	26.57%	Internet
18	7.11%	2.69%	Parking
17	6.72%	2.54%	Sewer
61	24.11%	9.10%	Telephone
37	14.62%	5.52%	Water
253	Respondents		
670	Responses		

Q30. How much is your individual monthly cost for all the utilities selected in the previous question

Count	Percent	
15	6.88%	Less than $25
27	12.39%	$25 - $49
70	32.11%	$50 - $99
53	24.31%	$100 - $149
23	10.55%	$150 - $199
26	11.93%	$200 or more
4	1.83%	I don't know
218	Respondents	

Q31. Which best describes your current lease length?

Count	Percent	
43	17.06%	Not applicable; I have no lease
22	8.73%	More than 12 months
134	53.17%	12 months
19	7.54%	Academic year (approximately 9 months)
5	1.98%	Academic semester (approximately 4.5 months)
27	10.71%	Monthly
2	0.79%	Other (please specify)

Count	Percent	
1	50.00%	6 months
1	50.00%	Lease ended ext month to month

252 Respondents

Q32. How difficult was it for you to find and secure your current housing accommodations?

Count	Percent	
49	19.44%	Very difficult
54	21.43%	Difficult
77	30.56%	Somewhat difficult
72	28.57%	Not difficult
252	Respondents	

Q33. How would you describe your current living situation?

Count	Percent	
236	30.65%	Very satisfactory
375	48.70%	Satisfactory
120	15.58%	Unsatisfactory
39	5.06%	Very unsatisfactory
770	Respondents	

Q34. If you described your living conditions as "unsatisfactory" or "very unsatisfactory", please indicate why: (Select all that apply)

Count	Respondent %	Response %	
51	32.90%	5.84%	High total cost of housing
57	36.77%	6.52%	Meal plan cost/requirement
14	9.03%	1.60%	Lack of safety and security

39	25.16%	4.46%	Too many restrictive rules and regulations
36	23.23%	4.12%	Too loud
66	42.58%	7.55%	Poor physical condition of building/unit
71	45.81%	8.12%	Dislike unit type/room layout
63	40.65%	7.21%	Lack of private bathroom
54	34.84%	6.18%	Lack of private bedroom
85	54.84%	9.73%	Not enough living space
53	34.19%	6.06%	Lack of kitchen
27	17.42%	3.09%	Lack of convenient laundry facilities
17	10.97%	1.95%	Lack of community spaces
43	27.74%	4.92%	Dislike roommates
4	2.58%	0.46%	Lease length doesn't accommodate needs
41	26.45%	4.69%	Too far from classes/academic activities
19	12.26%	2.17%	Too far from job/internship/volunteer positions
13	8.39%	1.49%	Too far from other students
66	42.58%	7.55%	Lack of convenient parking or public transportation
13	8.39%	1.49%	Too far from student life facilities
22	14.19%	2.52%	Too far from off-campus resources
20	12.90%	2.29%	Other (please specify)

Count	Percent	
1	5.00%	6 people in a suite meant for 4 people is too many
1	5.00%	All of the above
1	5.00%	Always too hot in the dorms
1	5.00%	Bus could stop twice on campus to accommodate students who live farther away. In the winter its hard to know how much time it takes when the sidewalks are all ice.
1	5.00%	enhanced occupancy
1	5.00%	ferry schedule does not work with clinical schedule
1	5.00%	FLOODING BATHROOMS
1	5.00%	Forced tripple, Too little discount, ned more housing on campus, theres not enough room for what USM is trying to bring in!!
1	5.00%	I’ve lived here my whole live so I want a break from it.
1	5.00%	Just don’t want to be living at home but can’t afford to move out while in school.
1	5.00%	Kitchen is nasty and not stocked with anything useful! Parking in the rear but having to walk around is a huge pain, especially the hours of it. Our room is not insulated well cold air comes in through the window and floors, even the vent filter cleaners were surprised with how cold our floors are. The cold air doesn’t work and it’s heat at full blast or nothing. We fill out how we like to live every year but it is not used because we either pick our roommates or 2 people randomly pick the same room.
1	5.00%	lease terminated
1	5.00%	my family is incredibly stressful so so is the house. Also, living off campus has made it nearly impossible to make any friends
1	5.00%	No roommate got put in
1	5.00%	Rarely have hot water, and there are always bugs everywhere
1	5.00%	Rats and bugs in ceiling
1	5.00%	RD is neglectful to her duties and picks and chooses what to do she would rather get someone in trouble than aid them
1	5.00%	Still live with parents
1	5.00%	Too expensive per month

1	5.00%		Unclean, dirty
155	Respondents		
874	Responses		

Q35. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live as a: - Freshman

Count	Percent	
340	56.29%	Gorham Campus
109	18.05%	Portland Campus
88	14.57%	I would have chosen to live off campus
67	11.09%	Not applicable; I did not attend USM (or do not plan to attend USM) during this year
604	Respondents	

Q36. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live as a: - Sophomore

Count	Percent	
239	40.99%	Gorham Campus
180	30.87%	Portland Campus
116	19.90%	I would have chosen to live off campus
48	8.23%	Not applicable; I did not attend USM (or do not plan to attend USM) during this year
583	Respondents	

Q37. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live as a: - Junior

Count	Percent	
109	19.36%	Gorham Campus
249	44.23%	Portland Campus
178	31.62%	I would have chosen to live off campus
27	4.80%	Not applicable; I did not attend USM (or do not plan to attend USM) during this year
563	Respondents	

Q38. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live as a: - Senior or Fifth Year

Count	Percent	
85	14.99%	Gorham Campus
224	39.51%	Portland Campus
243	42.86%	I would have chosen to live off campus
15	2.65%	Not applicable; I did not attend USM (or do not plan to attend USM) during this year
567	Respondents	

Q39. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a FRESHMAN STUDENT?

Count	Percent	
52	16.20%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
133	41.43%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
62	19.31%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
31	9.66%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
39	12.15%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
4	1.25%	I would not have chosen to live in any of the above unit types on the Gorham campus for my first year.
321	Respondents	

Q40. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a SOPHOMORE STUDENT?

Count	Percent	
34	14.98%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
33	14.54%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
60	26.43%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
45	19.82%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
50	22.03%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
5	2.20%	I would not have chosen to live in any of the above unit types on the Gorham campus for my first year.
227	Respondents	

Q41. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a JUNIOR STUDENT?

Count	Percent	
14	13.59%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
10	9.71%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
24	23.30%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
19	18.45%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
34	33.01%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
2	1.94%	I would not have chosen to live in any of the above unit types on the Gorham campus for my first year.
103	Respondents	

Q42. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a SENIOR STUDENT?		
Count	Percent	
14	16.87%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
5	6.02%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
16	19.28%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
11	13.25%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
34	40.96%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
3	3.61%	I would not have chosen to live in any of the above unit types on the Gorham campus for my first year.
83	Respondents	

Q43. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a FIRST-YEAR STUDENT?		
Count	Percent	
29	27.88%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
6	5.77%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
2	1.92%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
14	13.46%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
22	21.15%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
16	15.38%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
15	14.42%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
104	Respondents	

Q44. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a SOPHOMORE STUDENT?

Count	Percent	
29	18.01%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
17	10.56%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
8	4.97%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
34	21.12%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
33	20.50%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
34	21.12%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
6	3.73%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
161	Respondents	

Q45. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a JUNIOR STUDENT?

Count	Percent	
44	19.64%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
21	9.38%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
12	5.36%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
41	18.30%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
40	17.86%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
55	24.55%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
11	4.91%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
224	Respondents	

Q46. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a SENIOR STUDENT?

Count	Percent	
35	17.33%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
30	14.85%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
19	9.41%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
34	16.83%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
32	15.84%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
41	20.30%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
11	5.45%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
202	Respondents	

Q47. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a FIRST-YEAR STUDENT?

Count	Percent	
14	13.73%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
20	19.61%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
5	4.90%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
15	14.71%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
22	21.57%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
14	13.73%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
12	11.76%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
102	Respondents	

Q48. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a SOPHOMORE STUDENT?

Count	Percent	
22	14.01%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
23	14.65%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
21	13.38%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
33	21.02%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
21	13.38%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
29	18.47%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
8	5.10%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
157	Respondents	

Q49. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a JUNIOR STUDENT?

Count	Percent	
33	15.07%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
29	13.24%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
20	9.13%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
48	21.92%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
24	10.96%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
46	21.00%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
19	8.68%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
219	Respondents	

Q50. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a SENIOR STUDENT?

Count	Percent	
24	12.18%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
36	18.27%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
23	11.68%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
35	17.77%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
21	10.66%	Unit Type G2: Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
44	22.34%	Unit Type H1: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
14	7.11%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
197	Respondents	

Q51. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live during your: - First year of graduate / professional / law / doctorate program

Count	Percent	
18	15.52%	Gorham Campus
39	33.62%	Portland Campus
59	50.86%	I would have chosen to live off campus
0	0.00%	Not applicable; my program does not include this year
116	Respondents	

Q52. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live during your: - Second year of graduate / professional / law / doctorate program

Count	Percent	
12	10.53%	Gorham Campus
37	32.46%	Portland Campus
59	51.75%	I would have chosen to live off campus
6	5.26%	Not applicable; my program does not include this year
114	Respondents	

Q53. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live during your: - Third year of graduate / professional / law / doctorate program

Count	Percent	
6	5.41%	Gorham Campus
27	24.32%	Portland Campus
51	45.95%	I would have chosen to live off campus
27	24.32%	Not applicable; my program does not include this year
111	Respondents	

Q54. Based on the above summary of available housing options and associated rates, on which campus would you have preferred to live during your: - Fourth year and beyond of graduate / professional / law / doctorate program

Count	Percent	
3	2.78%	Gorham Campus
15	13.89%	Portland Campus
39	36.11%	I would have chosen to live off campus
51	47.22%	Not applicable; my program does not include this year
108	Respondents	

Q55. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a FIRST-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
1	5.88%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
3	17.65%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
5	29.41%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
3	17.65%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
4	23.53%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
1	5.88%	I would not have chosen to live in any of the above unit types on the Gorham campus for my first year.
17	Respondents	

Q56. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a SECOND-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
0	0.00%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
4	40.00%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
1	10.00%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
2	20.00%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
2	20.00%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
1	10.00%	I would not have chosen to live in any of the above unit types on the Gorham campus for my second year.
10	Respondents	

Q57. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a THIRD-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
0	0.00%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
2	40.00%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
0	0.00%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
0	0.00%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
2	40.00%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
1	20.00%	I would not have chosen to live in any of the above unit types on the Gorham campus for my third year.
5	Respondents	

Q58. If all the unit types described above were available on the Gorham campus at the assigned rental rates provided, what would have been your preferred housing choice as a FOURTH-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
0	0.00%	Unit Type A1: Single-Occupancy Bedroom in a Traditional Unit for $667 per month/$3,000 per semester/$6,000 per academic year
1	50.00%	Unit Type A2: Double-Occupancy Bedroom in a Traditional Unit for $556 per month/$2,500 per semester/$5,000 per academic year
0	0.00%	Unit Type B1: Single-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
0	0.00%	Unit Type B2: Double-Occupancy Bedroom in a Two-Bedroom Suite-Style Unit for $667 per month/$3,000 per semester/$6,000 per academic year
1	50.00%	Unit Type C: Single-Occupancy Bedroom in a Four-Bedroom Apartment for $778 per month/$3,500 per semester/$7,000 per academic year
0	0.00%	I would not have chosen to live in any of the above unit types on the Gorham campus for my fourth year and beyond.
2	Respondents	

Q59. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a FIRST-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
10	26.32%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
3	7.89%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
6	15.79%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
2	5.26%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
5	13.16%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
4	10.53%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
8	21.05%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
38	Respondents	

Q60. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a SECOND-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
8	23.53%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
3	8.82%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
4	11.76%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
3	8.82%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
5	14.71%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
4	11.76%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
7	20.59%	I would not have chosen to live in any of the above unit types on the Portland campus for my second year.
34	Respondents	

Q61. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a THIRD-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
3	11.54%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
1	3.85%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
6	23.08%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
2	7.69%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
4	15.38%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
4	15.38%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
6	23.08%	I would not have chosen to live in any of the above unit types on the Portland campus for my third year.
26	Respondents	

Q62. If all the unit types described above were available on the Portland campus at the assigned rental rates provided, what would have been your preferred housing choice as a FOURTH-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
0	0.00%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
0	0.00%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
1	7.14%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
2	14.29%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
4	28.57%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
4	28.57%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
3	21.43%	I would not have chosen to live in any of the above unit types on the Portland campus for my fourth year.
14	Respondents	

Q63. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a FIRST-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
7	18.92%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
8	21.62%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
1	2.70%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
5	13.51%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
3	8.11%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
5	13.51%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
8	21.62%	I would not have chosen to live in any of the above unit types on the Portland campus for my first year.
37	Respondents	

Q64. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a SECOND-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
7	20.00%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
5	14.29%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
3	8.57%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
4	11.43%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
6	17.14%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
2	5.71%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
8	22.86%	I would not have chosen to live in any of the above unit types on the Portland campus for my second year.
35	Respondents	

Q65. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a THIRD-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
3	11.54%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
4	15.38%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
3	11.54%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
5	19.23%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
3	11.54%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
2	7.69%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
6	23.08%	I would not have chosen to live in any of the above unit types on the Portland campus for my third year.
26	Respondents	

Q66. If your preferred housing choice WAS NOT AVAILABLE on the Portland campus, what would have been your SECOND housing choice as a FOURTH-YEAR GRADUATE / LAW / PROFESSIONAL / DOCTORATE STUDENT?

Count	Percent	
2	14.29%	Unit Type D: Single-Occupancy Bedroom in a Suite-Style Unit for $800 - $850 per month/$7,200 - $7,650 per academic year (9 months)/$9,600 - $10,200 per calendar year (12 months)
4	28.57%	Unit Type E: Single-Occupancy Bedroom in a Studio Apartment Unit for $1,200 - $1,300 per month/$11,250 - $11,700 per academic year (9 months)/$15,000 - $15,600 per calendar year (12 months)
1	7.14%	Unit Type F: Single-Occupancy Bedroom in a One-Bedroom Apartment Unit for $1,350 - $1,400 per month/$12,150 - $12,600 per academic year (9 months)/$16,200 - $16,800 per calendar year (12 months)
2	14.29%	Unit Type G1: Single-Occupancy Bedroom in a Two-Bedroom Apartment Unit for $1,120 - $1,170 per month/$10,080 - $10,530 per academic year (9 months)/$13,440 - $14,040 per calendar year (12 months)
2	14.29%	Unit Type G2:Double -Occupancy Bedroom in a Two-Bedroom Apartment Unit for $900 - $950 per month/$8,100 - $8,550 per academic year (9 months)/$10,800 - $11,400 per calendar year (12 months)
0	0.00%	Unit Type H: Single-Occupancy Bedroom in a Four-Bedroom Apartment Unit for $1,050 - $1,100 per month/$9,450 - $9,900 per academic year (9 months)/$12,600 - $13,200 per calendar year (12 months)
3	21.43%	I would not have chosen to live in any of the above unit types on the Portland campus for my fourth year.
14	Respondents	

Q67. Would you be willing to share living space with upperclass (junior and senior) undergraduate students?

Count	Percent	
12	10.08%	Yes, I would be willing to share my bedroom with an undergraduate student
25	21.01%	Yes, I would be willing to share my floor with undergraduate students if they did not share my unit
12	10.08%	Yes, I would be willing to share my building with undergraduate students if they did not live on the same floor
70	58.82%	No
119	Respondents	

Q68. If new housing is offered on the any USM campus, which building features/characteristics from the list provided below would be the most important to you? (Select up to five)

Count	Respondent %	Response %	
601	87.48%	21.85%	Overall affordability (including the cost of rent, utilities, parking, and other housing-related expenses)
333	48.47%	12.11%	Availability of the unit-type configuration I desire (suite-style, studio apartment, 1-bed apartment, 2-bed apartment, etc.)
32	4.66%	1.16%	Availability of a child-friendly living arrangement
190	27.66%	6.91%	Availability of a pet-friendly living arrangement
137	19.94%	4.98%	Availability of community-building/activity spaces (lounges, multipurpose rooms, meeting spaces, game rooms, fitness center, etc.)
188	27.37%	6.84%	Availability of a quiet place to study
131	19.07%	4.76%	Availability of dining/food service within the building
170	24.75%	6.18%	Quality of unit amenities (walk-in closets, spacious layout, etc.)
366	53.28%	13.31%	Availability of in-building laundry facilities
308	44.83%	11.20%	Access to dedicated resident parking adjacent to my unit
73	10.63%	2.65%	Access to public transportation/ride sharing stops
119	17.32%	4.33%	Availability of safety and security features in my unit/building
65	9.46%	2.36%	Aesthetic architectural features (look or feel of interior and exterior spaces, new building, historical building, etc.)

13	1.89%	0.47%	ADA accessibility
24	3.49%	0.87%	Other (please specify)

Count	Percent	
1	4.17%	Ability to live with my partner who is not a USM student
1	4.17%	Ability to make my own food, in a non-shared space
1	4.17%	AVAILABILITY good god
1	4.17%	Being older, I would not live on campus, so I do not want to mess up data by answering.
1	4.17%	boobs
1	4.17%	housing for students who have a spouse/partner who is not a USM student; graduate student housing;
1	4.17%	I can find more affordable rent off-campus, than housing describing in the previous spreadsheet.
1	4.17%	I own a house, I'm not going to use any housing at USM, regardless of its amenities
1	4.17%	I would just like to re-iterate how important it is that the proposed new housing would be affordable. Some of the prices per month offered before are strikingly similar to what you would find in off campus housing. I feel that the biggest draw to on campus housing in Portland would be the prospect of living in a desirable location with reasonable amenities without the typical city of Portland price-tag. If I can share a whole apartment with a friend off Campus for $1200 a month or $600 each, why would I pay more to live on campus?
1	4.17%	I would not live on campus
1	4.17%	I wouldn't live on campus.
1	4.17%	In room kitchen
1	4.17%	n/a
1	4.17%	N/A
1	4.17%	na
1	4.17%	None. I like my own home.
1	4.17%	Non-student must be able to reside with me (my partner who does not attend USM)
1	4.17%	not applicable
1	4.17%	Personal bathroom and kitchen space
1	4.17%	Pet Friendly, Transportation
1	4.17%	proximity to portland center
1	4.17%	Safety

687 Respondents

2750 Responses

Q69. If new housing is offered on the any USM campus, which of the following services/programs/policies would be the most important to you? (Select up to three)

Count	Respondent %	Response %	
148	21.70%	7.99%	Roommate matching service
470	68.91%	25.38%	The ability to choose my own roommates
289	42.38%	15.60%	Flexible lease/rental terms
155	22.73%	8.37%	As few rules and regulations as possible
340	49.85%	18.36%	Ability to stay in my unit during breaks
420	61.58%	22.68%	Ability to retain the same unit from year to year
30	4.40%	1.62%	Other

682 Respondents

1852 Responses

Q70. If your housing preferences were met for each year, for how many years would you choose to live on any USM campus?

Count	Percent	
18	2.61%	For the first year of my program only
64	9.28%	Through the second year of my program
109	15.80%	Through the third year of my program
275	39.86%	Through the fourth year of my program
78	11.30%	Beyond the fourth year of my program
126	18.26%	I would not choose to live in housing on the Portland campus
20	2.90%	Other (please specify)

Count	Percent	
1	5.00%	Again, I'm an older law student who would not live on campus, so I'm not going to participate here.
1	5.00%	As long as it was most convenient
1	5.00%	as long as needed until completion of degree
1	5.00%	For financial reasons I would still live at home
1	5.00%	For my entire undergrad career
1	5.00%	I like having my own house
1	5.00%	I own a house
1	5.00%	I would consider living on campus if it was affordable. At this point in time, and with the proposed prices, it is much more reasonable to live off campus.
1	5.00%	I would not live on campus
1	5.00%	it would depend
1	5.00%	It's way too expensive. Off campus living is around $550 a month and you don't have to deal with parking and getting tickets from USM every night due to the lack of parking spots.
1	5.00%	Likely as long as necessary
2	10.00%	N/A
1	5.00%	na
1	5.00%	None - it's cheaper to live at home
1	5.00%	None. I like living in my own home.
1	5.00%	Unsure

690 Respondents

Q71. How important is on-campus housing in building a sense of community and culture on USM's campuses?

Count	Percent	
341	49.14%	Very important
263	37.90%	Important
60	8.65%	Unimportant
30	4.32%	Very unimportant

694 Respondents

Q72. Do you have regular access to a vehicle during the academic year?

Count	Percent	
572	82.90%	Yes, my personal car
9	1.30%	Yes, via car sharing (e.g. Zip Car)
109	15.80%	No

690 Respondents

Q73. How important in the proximity of available parking in your housing decision?

Count	Percent	
295	42.82%	Available parking must be immediately adjacent to my living facility in order for me to consider living there
292	42.38%	Available parking must within a 5-minute walk to my living facility in order for me to consider living there
22	3.19%	Available parking must be within a 10-minute walk to my living facility in order for me to consider living there
5	0.73%	Available parking must be within a 15-minute walk to my living facility in order for me to consider living there
75	10.89%	Parking does not play a significant role in my housing decision
689	Respondents	

Q74. How do you typically get to and from your primary academic campus?

Count	Percent	
78	11.30%	Walk
121	17.54%	Ride the METRO Husky Line
388	56.23%	Drive alone
83	12.03%	Drive/ride with others
5	0.72%	Take a taxi or rideshare
4	0.58%	Ride a bicycle
1	0.14%	Ride a motorcycle/moped/scooter
3	0.43%	Ride public transportation
7	1.01%	Other (please specify)

Count	Percent	
1	14.29%	I live there
1	14.29%	i ride the bus some, and drive some
1	14.29%	Is witch back and forth from my own vehicle and the METRO
1	14.29%	On line
1	14.29%	Online
1	14.29%	Online student
1	14.29%	Take online classes

690 Respondents

Q75. How long is your typical one-way commute to your primary academic campus?

Count	Percent	
90	13.04%	Less than 5 minutes
70	10.14%	5-10 minutes
106	15.36%	11-20 minutes
215	31.16%	21-30 minutes
116	16.81%	31-40 minutes
54	7.83%	41-50 minutes
39	5.65%	More than 50 minutes
690	Respondents	

Q76. How difficult is it for you to travel from where you live to your primary academic campus?

Count	Percent	
21	3.14%	Very difficult
46	6.89%	Difficult
217	32.49%	Somewhat difficult
384	57.49%	Not difficult
668	Respondents	

Q77. What is difficult about traveling between your residence and primary academic campus? (Select all that apply)

Count	Respondent %	Response %	
174	61.70%	25.93%	Cost of transportation/gas
37	13.12%	5.51%	Inaccurate transportation schedule
49	17.38%	7.30%	Infrequent or limited transportation schedule
196	69.50%	29.21%	Length of travel
31	10.99%	4.62%	Safety and security concerns
141	50.00%	21.01%	Inability to find available parking
17	6.03%	2.53%	Lack of transportation infrastructure
26	9.22%	3.87%	Other (please specify)

Count	Percent	
1	3.85%	bridge goes up causing delays
1	3.85%	Bus drivers are so slow and stop in Westbrook instead of using the highway
1	3.85%	Commuting in winter conditions
1	3.85%	I live on campus right now because I live almost 2 hours away. I'm not sure if you were asking for "permanent" residence or not.
1	3.85%	Lack of campus maintenance, mainly in the winter
1	3.85%	Lack of space on the bus and buses that leave earlier than scheduled
1	3.85%	mad potholes
1	3.85%	No bus
1	3.85%	Over crowded busses !!! Some students are not even able to get on the bus at certain times and it has not been fixed within the two years that I have been here.
1	3.85%	The buses are late, then late to the campus, theres a lot of general public (i.e middle schoolers/ high schoolers who ride the bus limiting seats for us and most of us try to eat our meals on the go due to schedules hence not wanting to ride the bus) its not good in the winter either. With custom coach they were there early and we were able to get a seat on the bus and relax until scheduled leaving time versus now we have to wait in the cold weather conditions in order to get a seat or not miss the bus.
1	3.85%	Time wasted by driving every day
1	3.85%	TOLLS
3	11.54%	traffic
2	7.69%	Traffic
1	3.85%	TRAFFIC
1	3.85%	Traffic in Portland
1	3.85%	Traffic!!!
1	3.85%	Unbelievably shitty roads and terrible drivers
1	3.85%	use of ferry
1	3.85%	weather
1	3.85%	Weather dangers in the winter
1	3.85%	Weather in the winter

1	3.85%		Where I live, I get a lot more snow than Portland and it is often difficult to and unsafe to travel to class. They should really take into consideration commuting students when determining if classes should be canceled.
282	Respondents		
671	Responses		

Q78. What is your perception of safety and security on the Gorham campus?

Count	Percent	
300	44.91%	The Gorham campus feels very safe and secure
280	41.92%	The Gorham campus feels mostly safe and secure
73	10.93%	The Gorham campus feels somewhat safe and secure
15	2.25%	The Gorham campus does not feel safe and secure
668	Respondents	

Q79. How safe do you feel on the Portland campus?

Count	Percent	
185	27.09%	The Portland campus feels very safe and secure
337	49.34%	The Portland campus feels mostly safe and secure
137	20.06%	The Portland campus feels somewhat safe and secure
24	3.51%	The Portland campus does not feel safe and secure
683	Respondents	

Q80. Where do you plan to live next year?

Count	Percent	
193	28.01%	On campus at the Gorham campus
30	4.35%	Off campus in or near Gorham
118	17.13%	Off campus in or near Portland
197	28.59%	In my existing housing situation
58	8.42%	Undecided
93	13.50%	Not applicable; I will not be attending USM next year
689	Respondents	

Q81. What are your primary reasons for not attending USM next year? (Select all that apply)

Count	Respondent %	Response %	
83	89.25%	74.77%	I will have graduated from my program
9	9.68%	8.11%	I will be transferring to another institution
1	1.08%	0.90%	I will be studying abroad
3	3.23%	2.70%	I will be leaving to pursue other endeavors
4	4.30%	3.60%	Cost of tuition
5	5.38%	4.50%	Cost of living expenses
4	4.30%	3.60%	Campus/student life reasons
2	2.15%	1.80%	Other
93	Respondents		
111	Responses		

Q82. What is your current employment status, including internships and volunteer positions? (Select all that apply)

Count	Respondent %	Response %	
123	17.93%	15.61%	I work/intern at part time at the Gorham campus or in Gorham
134	19.53%	17.01%	I work/intern part time at the Portland campus or in Portland
243	35.42%	30.84%	I work/intern part time elsewhere
8	1.17%	1.02%	I work/intern full time at the Gorham campus or in Gorham
27	3.94%	3.43%	I work/intern full time at the Portland campus or in Portland
133	19.39%	16.88%	I work/intern full time elsewhere
120	17.49%	15.23%	I do not currently have a job or paid internship
686	Respondents		
788	Responses		

Q83. What are the primary sources of funding for your academic (tuition, fees, books) and living expenses (housing, meals, etc.)? (Select all that apply)

Count	Respondent %	Response %	
379	55.01%	18.29%	Personal income
264	38.32%	12.74%	Personal savings
253	36.72%	12.21%	Family/spousal/parental support
430	62.41%	20.75%	Financial aid
371	53.85%	17.91%	Academic scholarship or stipend
343	49.78%	16.55%	Student loan(s)
32	4.64%	1.54%	Other (please specify)

Count	Percent	
1	3.13%	CH.35 VA benefits
1	3.13%	chapter 33, gi bill
1	3.13%	Credit card
1	3.13%	Disability income
1	3.13%	Employee Waiver
1	3.13%	employee waivers
1	3.13%	employer
1	3.13%	Employer
1	3.13%	Employer- MSAD44
1	3.13%	Employer payments
1	3.13%	For clarification, I get very very little financial aid. I struggle to pay out of pocket what is left after government loans. Family members will help me out as best they can.
1	3.13%	Full-Time Job
1	3.13%	G.I. Bill
1	3.13%	Gi Bill
3	9.38%	GI Bill
1	3.13%	Its hard to even afford in state tuition with scholarships due to them being very limited. I wish there were other ways to get higher level scholarships to help afford living on Gorham Campus.
1	3.13%	Military G.I. Bill
1	3.13%	Post 9-11 G.I. Bill
1	3.13%	Residential Assistant stipend
1	3.13%	some employer assistance

1	3.13%	special grant program
1	3.13%	Tuition Waiver
1	3.13%	tuition waiver/self
1	3.13%	Unemployment
1	3.13%	va
1	3.13%	VA
1	3.13%	VA benefits
1	3.13%	VA-Chap 31
1	3.13%	Work Reimbursement
1	3.13%	Work tuition reimbursement

689 Respondents

2072 Responses

Q84. What is your age?

Count	Percent	
3	0.44%	17 or under
190	27.66%	18 - 19
204	29.69%	20 - 21
120	17.47%	22 - 24
73	10.63%	25 - 29
66	9.61%	30 - 44
31	4.51%	45 and over

687 Respondents

Q85. What is your gender?

Count	Percent	
169	24.64%	Male
508	74.05%	Female
9	1.31%	Other

686 Respondents

Q86. What is your marital/family status?

Count	Percent	
553	80.73%	Single with no dependent(s)
29	4.23%	Single with dependent(s)
71	10.36%	Partnered/married with no dependent(s)
32	4.67%	Partnered/married with dependent(s)

685 Respondents

Q87. Which best describes your residency status?

Count	Percent	
527	76.71%	Domestic/U.S. citizen
129	18.78%	Permanent U.S. resident
17	2.47%	International
1	0.15%	Other (please specify)

Count	Percent

1	100.00%		Canadian
13	1.89%		Prefer not to answer
687	Respondents		

Q88. What is your ethnicity?

Count	Percent	
30	4.39%	Two or more races
5	0.73%	American Indian/Alaska Native
16	2.34%	Asian
15	2.19%	Black/African American
16	2.34%	Hispanic/Latino
0	0.00%	Native Hawaiian/Pacific Islander
0	0.00%	Nonresident Alien
594	86.84%	White
8	1.17%	Other
684	Respondents	

Q89. Are you a veteran?

Count	Percent	
27	3.93%	Yes
660	96.07%	No
687	Respondents	

Q90. Please feel free to provide additional comments and suggestions regarding future housing on USM's Portland campus.

Count	Percent
195	100.00%

Count	Percent	
1	0.51%	its a bad idea focus on what students we have now. Also building in Gorham would be much smarter, and cheaper. No name change
1	0.51%	$800 a month is a lot compared to other places in portland
1	0.51%	.
1	0.51%	Additional housing on the gorham campus for the current residents are more important than providing housing on the portland campus. Gorham is primarily a residential campus anyway and increasing the residency halls on the gorham campus would bring more people to the town and area. If Portland housing is to come about it needs to be done quickly and be affordable to students and can be used in conjunction with their current financial aid. Transportation between ALL THREE campuses would benefit the housing shortage in gorham and potential increased housing in portland in order for students to get back and forth freely between campuses. Portland housing should not be more than the apartment cost in an Upperclass apartment in gorham if the amenities are the same.
1	0.51%	Affordability is a big part of living on campus. Right now Gorham campus is too expensive for many when they are forced to have a meal plan as well. If the price stayed roughly the same, minus the forced meal plan, students would be able to willing to live on campus again. I remember living on campus having to pay $2400 a semester for food , when right now I pay about $500 for food for the whole semester by living off campus. Make backing out of a meal plan an option for Portland Campus students.
1	0.51%	Affordability is important.
1	0.51%	Affordable and enough housing to fit many individuals. DOES NOT need to get a food plan.
1	0.51%	Affordable student housing in Portland is a great idea, please do it
1	0.51%	Affordable studio, Can choose own roommate...,like wife/husband or girlfriend or one family member
1	0.51%	As a nursing major, all of my classes are on the Portland campus starting in my sophomore

			year. I would really like to be able to live on the Portland campus. Also for the prices listed monthly to actually live in one of the Portland campus apartments, it would be cheaper to get a single bedroom apartment with my boyfriend somewhere in Portland. If possible I would recommend any decrease in prices of those units.
1	0.51%		As it is student housing, making the apartments not as expensive as outside housing by even a small amount would be a real driver into whether a student, such as myself, would choose USM housing rather than outside housing.
1	0.51%		as nice as this would be, we also need housing on the Gorham campus.
1	0.51%		As someone who transferred into USM from a traditional, private 4-year college, I was not intending to attend USM for the "college experience." And I certainly did not have it--I describe my experience at USM more as "taking classes" than "going to college." That being said, I loved my experience living and working in Portland during my time at USM, and was able to create a network of both friends and professional connections within the Portland community. Going to school in a more urban environment, with more of an "open campus" being the city itself, there are lots of perks that you don't find at a traditional school situation. I believe that the addition of apartment-style housing on the USM Portland campus would certainly attract students from out of state, as well as foster a stronger sense of community that the Portland campus currently lacks (it's certainly a "commuter school"). I think that so long as the housing doesn't reflect traditional dorm-type living, it would be a successful and popular addition; I do not think dorm-style, shared room housing would be as popular as many USM students are not attending USM in search of a traditional college experience.
1	0.51%		Bayside Housing is a scam and not something USM should associate with
1	0.51%		Before I got my current job, I had to live at home in West Paris, Maine in order to make ends meet while attending USM/avoid racking up extreme student loan debt. During that time, I worked 41 hours per week in addition to attending school full time. Living in Portland or Gorham was not a reality for me as I would be paying too much to live on campus (plus I have pets) and it is way, way too expensive for students to live off campus with pets. Something that I really love about USM is the flexibility that it offers for students with their education. The blend of online classes versus on campus classes offered at a variety of times to meet everyone's schedules is fantastic and it has allowed me to continue to work and support myself while still attending school full time. For many Maine students, student loan debt and affordability of simple living is a severe burden that impacts both their education and their mental health/overall wellness. Offering more affordable, apartment style living in the heart of Portland would be great for such students, and everyone who is struggling to transition from student life to adulthood. Portland has an immense amount of part-time and full-time work opportunities for students allowing them to have less of an overall financial burden, and is in extreme proximity to a variety of entertainment options that help students relax. However, offering housing at the expenses of around $10,000 per year per student to those who already have trouble affording to attend college much less live, this would be either an added burden to their already existing troubles, or would single out students who don't have the same financial opportunities as others. So overall, I think the idea of adding more housing options in Portland would be fantastic for USM, but I think the price-tag is far too high for the average student.
1	0.51%		Build more housing. and making parking better.
1	0.51%		College is already expensive enough, no one is going to live in those Portland campus housing plans with the cost being that high when though the cost of living is high in Portland, there are plenty of apartments that are 600-800 a month, a rate of 1300 is absolutely ridiculous. People would rather have a smaller closet than pay that much.
1	0.51%		Definitely have options including regular dorms and suit style. And make sure you have enough room for incoming and current students.
1	0.51%		Definitely wanted
1	0.51%		Despite not living on campus due to my program being based out of LAC, I think on-campus housing is important for building the USM community.
1	0.51%		Do housing in Portland
1	0.51%		Doesn't matter where housing is, you need more housing period. Its terrible that there is no housing and people need to go off campus.
1	0.51%		Don't "enhance" it
1	0.51%		Don't make it super expensive, no ones going to want to live there when they could get housing in Gorham. Make sure there is off street parking.
1	0.51%		Due to the poor quality of Sodexo’s food on the Gorham campus alongside mislabeling of food that has led to allergic reactions and food poisoning, no student should be required to pay for a meal plan regardless of their living situation. As a student forced to pay for a meal plan myself, I hardly use it due to the lackluster food quality and mislabeling issues, often getting food elsewhere or making it myself utilizing the microwave in my suite as well as the hall’s kitchen. Forcing students to pay for poor dining services that they don’t use is a gross waste of money. No student should be forced to spend hundreds of dollars on a service they have no desire to use.

1	0.51%		For the possible Portland housing, $800 lowest price is too much. It's all fine and dandy that administration wants to "keep young people in Maine/attract more young people" but at this rate I will not be able to afford living in the Portland area even when I graduate with my MSW in 2020 from USM. I Don't want to leave Maine, but there are great places elsewhere that I can afford to live.
1	0.51%		Gender-inclusiveness should be a considered factor :)
1	0.51%		Get it, fast. I was told Gorham housing would be convienient and a great way to bond with students. I absolutely dislike almost everything about the way housing was handled this year. It's ridiculous that I was forced to chose between two of my best friends even though I'll be a junior next year living in Robbie Andrews. The worst dorm on campus. The facilities are always broken. Bathroom doors on 3rd Anderson were still broken from the previous academic year. I think it's ridiculous that because I couldn't find some way to apply to housing early, I had no option to live in upperclass housing or in any setting that I had hoped for. Now I am moving off campus and have to pay rent because housing has made me fee so hopeless that it's hurting my academics.
1	0.51%		Get Portland housing. Will attract a lot more students as Portland has a lot more than Gorham.
1	0.51%		Girls are too caddy I wouldn't want to live with them even if we had a suite of singles. A lot of my friends end up hating their roommate and it's awkward. Living with my boyfriend and our pets is more comfortable for sure.
1	0.51%		Given how expensive rent is becoming in Portland, it would be nice if there were affordable 1 bedroom apartment/studio style options for adult students who are too old to live in a dorm
1	0.51%		Good proximity to campus
1	0.51%		Had I known during my tour that housing will not be guaranteed, and especially on campus apartments for my sophomore year like I was told would be, I would've had more time to plan ahead for living off campus. Unfortunately, we have to move off campus.
1	0.51%		Have housing for current students rather than over accepting and forcing current students to not have living on campus.There is not enough room for all of us and many currents did not get a room for next year.
1	0.51%		Honestly I would really like to have housing on the Portland Campus; if it happens while I'm still attending USM I would definitely use it!
1	0.51%		Housing in Portland is key to building a stronger USM community. I think, however, it should be STRICTLY students only, no kids or families. I think that general "college experience" is more attainable in Gorham because that's where the athletic field is..I but as a 22 year old a dorm closer to the OldPort would be ideal for my 3rd and 4th year.
1	0.51%		Housing in Portland would encourage students to take part in more extracurriculars because most clubs are held late in Portland, meaning students now have to wait a while in Portland unless they want to make the trip back to Gorham, then to Portland again, then back. I think it would also increase admissions numbers, and at the very least reduce student upset over overcrowding in the dorms. For people who need to take late night classes, they wouldn't need to wait for the bus, since busses run less frequently the later it gets, and they could go directly home and get more sleep.
1	0.51%		Housing needs to be affordable.
1	0.51%		Housing on the Portland campus is a great idea for the students and the university and I think it definitely should be done
1	0.51%		Housing on the Portland campus is a necessity. As a freshman I take all of my classes in Portland until late at night and have to commute back to Gorham. The bus does not run frequently enough at night to be useful so I have to drive and spend money on gas. Living in Portland would make my life easier, as I would have no need to go to Gorham at all due to the fact I don't have a class there at all.
1	0.51%		Housing on the Portland Campus needs to happen - especially if the name change is happening. Kids don't want to come here thinking they are living in Portland and then being stuck in Gorham. Prioritize housing before the name change (nobody wants that anyways). I moved off campus because it was so crowded, and each year it only gets worse. IT'S A MESS, USM!
1	0.51%		Housing really doesn't seem to be an important factor for students deciding to pursue my program.
1	0.51%		Housing should be made available as soon as possible. Due to the lack of housing I have been forced into a housing situation that I am uncomfortable with and unhappy with. This is the third time that I will be in a room that will affect my ability to get my school work done, the ability to have my own schedule, the ability to have healthy food, and a safe space for myself and others. Housing at usm is extremely lacking in basic needs for students and I have been extremely disappointed. I have been forced into being required to live on campus as part of a scholarship and living like this has severely affected my schooling and my health both physically and mentally.

1	0.51%		I am a non traditional student so I really do not have an opinion. However, location and expenses are an issue from what I have heard from other students.
1	0.51%		I am appalled at the fact that USM is accepting so many students with the false pretenses that they will have a secured spot with on-campus housing the years following their first. Clearly this is not the case. I think more housing needs to exist immediately.
1	0.51%		I am really hoping for housing to come to Portland! It would be great for upperclass students to enjoy more of a city life in a new building! Housing in Portland would be great!
1	0.51%		I am worried about the impact on the intersection of Brighton/Falmouth/Bedford Streets and the surrounding park & residential areas. If a change is to be made at that intersection (i.e. roundabout) I hope it is thoroughly thought out and compared to other intersections so that it can operate successfully. I also don't find it aesthetically pleasing to build a large dorm on the Portland campus. I don't think adding housing is going to increase enrollment enough to offset the expenses. I also don't think the student housing will be any more affordable than local apartments. In my personal cost benefit analysis I don't think Portland campus student housing is a good idea. What about partnering with an already existing establishment to work on student housing? i.e. Bayside Village or similar
1	0.51%		I could see this feeling helpful to many students, though I personally am not interested in it. One of the main reasons I chose USM is because I could be a commuter student and in some ways separate my school, work, and home life.
1	0.51%		I dislike that I was put on a waiting list for housing before my day to apply even came, I wish I could live with the people I would have chosen to live with instead of forcing enhanced occupancy on people I don't know, and I feel like this could have been handled better
1	0.51%		I feel that the addition of on-campus housing on the Portland campus would have a very positive influence on the culture of USM. Although I do not want to live on campus, I would have strongly considered staying on campus during my undergraduate if there were housing options in Portland.
1	0.51%		I feel that USM needs to have more housing sooner rather than later. USM already has run out of housing availability for many students and is soon expecting a higher rate of applicants/acceptance while not having enough housing to live comfortably. I know there are many tripples and higher occupancy rooms on campus. I know that these situations are not ideal from personal experience and could not imagine having to stay in one of this rooms for more than a couple of month.
1	0.51%		I has to be cheaper then the cost of housing out side of the campus and closer to campus
1	0.51%		I have a unique and cheap housing situation that makes my studies possible. If it were not for that and my personal savings, I would need to have loans. Having a building for grad students might make more people try to go full-time though!
1	0.51%		I know some graduate students have a hard time looking for accommodations while attending grad school at USM. It didn't affect me, I already live here.
1	0.51%		I love the idea of having graduate student housing on the Portland campus. However, I understand that there may not be as much demand for graduate student housing, and that undergraduate housing is most likely a bit higher of a priority.
1	0.51%		I love the idea of Portland housing, and while it may be good for those who already live in Portland, the prices are just so much higher than Gorham it's not worth it to me to live there.
1	0.51%		I really enjoyed this survey!
1	0.51%		I think before we start worrying about having housing at the Portland campus let better Gorham dorms and cafeteria first. Thank you
1	0.51%		I think having housing in Portland is really important and helpful for the students. I personally choose to live at home because it saves money, but if I had to live on campus I would want the option to live on either campus
1	0.51%		I think having housing options in Portland would be good for students who are traditional age and their programs are based in Portland. If I had gone to school as a traditional age I might have lived on campus, but I have only ever had class in Gotham once. Traveling between would have been a huge annoyance. However, our Portland community seems to be mostly commuters, I'm not sure enough students would use on campus housing to be worth building expenses.
1	0.51%		I think housing on the Portland campus is a great idea, though I would not take advantage of this service (I own a home in Lewiston). By offering housing in Portland, you will attract new students to the area as well as help support the economy in the Portland area.
1	0.51%		I think it would be a good idea but I would choose to stay where I am and would not take advantage of the on campus housing in portland.
1	0.51%		I think it would be a great option!
1	0.51%		I think it would be good for people who have to take the bus everyday and have most classes in Portland. I also believe it would free up space in gorham for those who never go

			to Portland, like me.
1	0.51%		I think it would be great for USM to provide housing on the Portland campus. I think people would really like that option.
1	0.51%		I think it would be great if there would be housing on the USM Portland campus
1	0.51%		I think it's too expensive
1	0.51%		I think more singles should be available
1	0.51%		I think remodeling the housing at USM would make the school more attractive and desirable to go there for future students. It would build the community. It would also decrease the amount of students who commute and make them more involved if they spent more time on campus.
1	0.51%		I think that creating housing on the Portland Campus is a terrible idea. It will further clog an already overflowing area.
1	0.51%		I think that it is going to be way overpriced and it is much cheaper to live off campus. I also think parking is a huge deal because currently at the gorham campus they ticket non stop but there isn't enought spots to park and when you have a ton of stuff to carry you can't park down by the athletic fields and walk all the way to Woodward hall.
1	0.51%		I think that students would be mosh interested in the type of layout described in the meeting. For example living in a "pod" the highest values to students seem to be having their own bedroom and a space to cook food as to not require a meal plan. Other than that I do nothing think students would mind sharing a living space with others. The cost needs to be lowered as these rates are NOT competitive with other housing options in Portland. Most students would not be willing to pay much more than they would, for the same style on the gorham campus.
1	0.51%		I think that the hardest part is as a girl I don't like walking from all the way down the hill to my dorm. I work off campus and sometimes I would get back to campus at 11pm and it's veey creepy having to walk that far
1	0.51%		I think that the suggested rate for living in a dorm on Portland is way too expensive. I think you will run into trouble with too many people wanting to live in Gorham because it's cheaper. Let face it, we are broke, we can't afford and $1,000 rent. I see that as a huge deterrent. And I also think it is rediculous to have different prices for campuses. That in itself creates a segregation by how much money you have which is unfair. We already have community issues at USM and I feel that could separate us even more.
1	0.51%		I think that we should fix housing in Gorham, before we spend money to add more housing in Portland. Because the dorms in Gorham need fixing.
1	0.51%		I think the ideas you guys have for apartment layouts are great!
1	0.51%		I think the option of housing in Portland for upper class students is important, but parking in Portland is already an issue that needs to be addressed. I feel part of the parking issue on both campuses would be solved with a return to a no-car policy for first year students.
1	0.51%		I think there should also be a place for food in Upperclass Hall in Gorham. I know that has nothing to do with Portland housing but on days when the weather is awful (a.k.a all winter) and for those of us who have a meal plan because we're in a suite, it would be nice to not have to walk across campus to eat real food. Not all of us have money to stalk up on groceries either, that money goes to the school or towards textbooks etc.
1	0.51%		I think there should be a housing option for older returning students separate from regular dorms. As a returning/older student, I felt uneasy about relocating to Maine, I did not have connections or resources to live off campus when I first transferred. It would have been nice to have a housing complex dedicated to older people who are serious about their education coming to Maine for a specific degree program. Maybe a housing complex for people where if they have a young child there could also be an option. Maybe including a minimum age requirement of at least 23 years old to be considered for this type of housing. I was 27 when I moved into my double with my roommate who was 21 creating an unsafe and unstable environment for me to participate and learn fully... there were also many older students (not as old as I was) who lived in the building creating a strange environment for the children (17-20) who were fresh out of high school. IT was so strange that these interactions would happen in a dorm situation where we are supposed to be PROTECTING these kids. Also when I was accepted to USM I did not know I would be living in Gorham what a pain that was having my classes, work, internships and community in Portland but I am confined to Gorham campus with a terrible bus scheduale it felt very disempowering. I also know older students who lived at Bayside and took that as an option because of the awkwardness of being an older student in a dorm... their living situation was also terrible because they were not matched with other students and instead we're stuck in a year-long lease with terrible random roommates. I think if you want people to pursue a degree here and be taken seriously in the New England area than housing needs to accommodate all students not just the babies who are right out of high school. USM has more of a commuter school feel why not change the way you receive older students and maybe see a change in the community and don't promise people Portland if you are going to force them to live in another town 30 mins west.

1	0.51%		I think USM should do everything in its power to make the cost and quality of housing comparable between campuses. Charging more to live on the Portland campus could segregate the student population by class, rather than make it possible for students to live wherever is most convenient to their life and program of study.
1	0.51%		I think you need a better filter to your surveys. I attend school at a satellite site located in the MSAD17 central office. None of your questions applied to me and none of my answers were helpful to you.
1	0.51%		I want to live on campus, but I have to stress about being on the waitlist this year, which is ridiculous considering I'm a freshman who can't drive, and I couldn't even pick my dorm on my lottery date this year without all the available spaces being filled up already. It's ridiculous that I'm picked to go to this school, but then I might be possible kicked out of the dorms and have nowhere to live the next semester. Paying for a rented apartment is out of the question, my house is hours away, and my major is the only one offered at this college in Maine. There needs to be more housing if USM is really concerned with changing our name to UMP to bring in more students. More students means more housing, and we are already backed up, so please build more dorms STAT.
1	0.51%		I will be returning as a graduate student eventually and would look into living in the Portland area. The cost of tuition and the projected housing costs in Portland and the options outlined in this survey were VERY high, and would put myself (and other students) in significant debt with student loans.
1	0.51%		I wish there was access to more affordable housing and that you didn't have to pay a deposit if you don't end up living on campus, but still wanted to apply and have the option
1	0.51%		I wish USM had offered housing on the Portland campus in the first years of my career here. One of the biggest reasons I decided to attend USM was to get to know the city of Portland more, which I found very hard to do with the living situation being restricted to Gorham. I think students will have a chance to curate a community within USM as well as within the Portland area more efficiently if USM had housing in Portland.
1	0.51%		I would like to be in a single. I need my personal space to study, relax and be able to to have alone time. I found it difficult to always be around someone..
1	0.51%		I would LOVE to live on the portland campus, however, the rates provided are much to high and I do not want to be locked into a years contract when im in school for only 2/3 of that time. If there were apartments just like upperclass, i believe the rates should match as well as how long you have to pay for
1	0.51%		I would say to make sure there is a dining area where students can get food and parking for the students as well.
1	0.51%		I would very much like there to be Portland housing. I would however want laundry services to be available as it is much much more convenient and much less expensive if you don't have a car to drive to a laundromat. Having a kitchen is also very important to lots of people since it gives them much more control over their diet than they get relying on the school's food. I think that it is very important to have more housing. I believe that it is unacceptable for the school to displace current students who rely on on campus housing in favor of freshman simply to try to increase student enrollment. I would not be able to attend school if I were to be displaced.
1	0.51%		I'm not your typical student
1	0.51%		I'm glad that this survey is coming up because many of my friends did not receive housing and many live in different states and do not have a car and seem to be homeless for next year. If there was more housing and more options for the ones everyone wants then a lot of problems would be solved.
1	0.51%		If I had had the opportunity to live on campus in Portland I likely would have come to USM during my freshman/sophomore year(s). When applying to college during high school I didn't find living in gorham and commuting to the portland campus appealing, so I went elsewhere. I decided to transfer after moving back to maine and getting a job. Housing is incredibly difficult to find in the portland area, so I think dorms or affordable apartments is a great idea. Definitely a better use of money than changing the name of USM (again).
1	0.51%		If Portland will have a residence hall: Allow older students (21+) to choose into Portland residence with priority.
1	0.51%		If the university is going to try and sell "The University of Maine - Portland", instead of USM, then on-campus housing will be important, otherwise the name change is a fraud to increase possible enrollment of undergrads.
1	0.51%		If there were an option initially my first year, 2014, I would've lived on campus if there was housing on the portland campus but only if it was dorms right on campus. I personally don't think having apartments would be smart, it should be something like philipi or upperclass
1	0.51%		If this is really where you think money will be best spent, I do not know enough about the school to say otherwise. However, I would look to assure that you are making sure funds stay allocated to the law school, as the loss of professors as a result of not giving them tenure was a massive loss.

1	0.51%		If USM Nursing is going to limit spots in program for Portland campus it would be nice for them to offer us bus transportation between Portland and Lewiston campus
1	0.51%		If you are considering putting more housing anywhere, not just Portland, make sure there is parking, and that it is only for students living there. The Portland campus parking is THE WORST when someone decides to have an event and those people take up all of the parking. I have been late to multiple classes just because I had to spend 30 min searching for a parking spot that I didn't have to pay for. I already pay for parking here, I shouldn't have to pay for meter parking just because someone is having an event on my campus. The same is for Gorham. If more students keep being accepted, you really need to add both more housing as well as more parking. I was lucky enough to avoid the enhanced occupancy rooms my 4 years here, but I have moved multiple students into those rooms for the past 3 years, and none of those students were very happy about it.
1	0.51%		If you had graduate housing, specifically graduate apartments, I would seriously consider utilizing campus housing. Likewise, if the meal plan was a bit more commuter-friendly, I would use on-campus dining more, and I would definitely use it if I had on-campus (or near campus) graduate housing. I am in the process of selling my house because I couch-surf with friends to make it to my clinicals for my program since I cannot get to them from my island home. Graduate housing would be a HUGE benefit for me! In fact, I am looking at other schools to complete my DNP after my MSN where graduate apartments are an option.
1	0.51%		If you're going to change the USM name you need to provide Portland housing. It's deceiving and wrong that you're trying to market and brand a school that is mostly in Gorham. Name the school University of Maine in Gorham if you're going to change the name since that is where students will actually be living. This school has given lots of false hope about Portland housing over the past 4 years I've been involved with this school. The school seems to have their priorities mixed up. Forcing people into triples in the dorms is so messed up. I will never return to on campus housing. Over priced, over barring staff, and uncomfortable living space.
1	0.51%		Improvements in the cafe would have kept me on campus longer as well as better parking by the dorm you lived in. I also think having housing on portland campus would be ideal because most upperclassmen have classes in portland
1	0.51%		In the Gorham campus housing the bathrooms need SO much attention to create useful restrooms. The showers are so outdated that it is uncomfortable to take a shower. In Anderson Hall there is no changing room just a curtain, it can be uncomfortable for residents to use these showers if they feel self conscious or awkward. Please work on having efficient bathrooms for years to come! The space of the showers are so tiny very hard to shave legs with little room in a single standing stall! If there will be community bathrooms in Portland make sure to consider the future and how much the bathrooms would be used from people living on the floors. Make enough parking available for new residents in Portland, possibly making another parking garage would be great!
1	0.51%		Increase availability, stop accepting residential students when you can barely house the unreasonable amount you have now. Current returning students are considering dropping out because they cant get housing again for this fall.
1	0.51%		It seems the cheapest rent for the potential housing for Portland is still decently expensive. I live on East End and even when it was me and one other roommate, I payed less than what would potentially be offered through USM.
1	0.51%		It should be upperclassmen and be the same payment arrangements as gorham.
1	0.51%		It would be really good for there to be Portland housing. If there was housing in Portland, I would never have to be in gorham which would save me money on gas. I am only ever in gorham to sleep, because all of my classes are in Portland and have been since my first semester.
1	0.51%		It would have made life a lot easier if there was housing on the Portland campus. It really was a pain driving from Gorham everyday.
1	0.51%		It's important to make it financially accessible, this is still a college and students are still poor. With occupancy rates in Gorham in their current state, it would suck for a student to have to pay more for a dorm/apartment in Portland just because there isn't room in Gorham for them. Alternatively, people may flood Portland dorms and then picking who lives where could get tricky. Also, parking is one of the biggest reasons I moved off campus, please please give more parking options with these new dorms.
1	0.51%		LEED certified
1	0.51%		Looking forward to it.
1	0.51%		More housing on Gorham too
1	0.51%		More quiet study locations would a large plus!
1	0.51%		More single rooms! I am an adult and would prefer to have my own bedroom
1	0.51%		My apartment in downtown Portland is $650 per month, much cheaper than any of the housing options provided in this survey.

1	0.51%		My fiancé is not a USM student yet and we have a dog, so living on campus is not an option for me. Pet friendly rentals and the ability to have non usm students would be great for people in similar situations as we're currently paying way too much for rent. Portland is an expensive area and housing in Gorham is very limited
5	2.56%		N/A
1	0.51%		Na
2	1.03%		NA
1	0.51%		Native American tuition waiver specific housing/dorm floor
1	0.51%		Need more parking on Portland campus, and people like single apartments or studios
1	0.51%		Not all survey questions are applicable. For example, I have never taken a class on the Gorham campus and have never been to that campus. Also I own my home as opposed to renting and I know a number of others in my MBA program who work full-time also own their own homes..
1	0.51%		On campus housing would be fantastic for newer students coming into the school, but older students likely would like to try living on their own. I don't believe that living at the Gorham campus is necessarily the best option, academically - most of my resources are on the Portland campus, and I don't think that more limited access would have been conducive to success. That said, I have practically no experience with the Gorham campus (I've taken one class there during my three years here), and so I'm not entirely sure which additional resources are available over there. I'm talking about access to my professors, academic advisors, and the various departmental offices at USM, all of which are on the Portland campus.
1	0.51%		Opening up any type of housing in Portland would solve the housing crisis existing right now. Please make it happen.
1	0.51%		Parking is pretty much the thing that needs the most improvment. That can make or break my day every day I come home to campus.
1	0.51%		Please allow undergraduates to reside in Portland. Please build dorms on Portland!
1	0.51%		Please don't take away the entire availability of parking for off-campus/commuter students.
1	0.51%		Please fix parking. Thanks.
1	0.51%		Please get it built as soon as possible. You should see the amount of people from Freshman classes who don't come back. The "enhanced occupancy" is actively driving people away from USM, as is the asinine policy of admitting more students than USM has housing capacity for.
1	0.51%		Please get this housing. We need it!!
1	0.51%		Please keep campus green space in mind whenever new construction begins. It's already pretty lacking in Portland.
1	0.51%		Please make it more affordable!
1	0.51%		please please please consider an on campus bar! only if the direction is for upper class-graduate students. There used to be one, other campuses have them, and there are more benefits than disadvantages for them.
1	0.51%		Please take care of the mess USM has created for rooming in the past two years. USM is a good school but many current students are beginning to resent it because we didn't sign up for the Rooming Selection: Hunger Games edition. We are accepting a lot of students and its crammed in here already.
1	0.51%		Please, please, please provide more than enough parking for residents of you choose to add housing on the Portland campus. My current form is surrounded by teacher and computer parking and the woodward lot, which is very small. There isn't enough parking for the students who live in Anderson.
1	0.51%		Portland Housing is a great idea. I would have preferred living in Portland for the first 3 years of my time at USM
1	0.51%		Portland is not affordable at this point, especially if you have children or pets. I'm going to be forced to keep moving farther and farther away to be able to afford rent. Makes it so difficult when you're working full time 40hrs a week, have a part time internship of 20hrs/week, and then classes and school work too. How is there time to wast 2 hours a day driving too and from Portland campus to your home 20-40 miles from campus.
1	0.51%		portland's proposed housing costs seem to be quite expensive, apartments off campus are pretty comparable. if they want to attract more students, they should consider this
1	0.51%		Price should be the same as Gorham dorms
1	0.51%		Provide covered areas with places to lock a bike both on campus and near housing (Masterton breezeway?)

1	0.51%		Provide enough housing for every current student without over accepting more students. Give students housing on the campus that has there primary classes (music students on Gorham campus). DONT RUN OUT OF HOUSING FOR CURRENT STUDENTS.
1	0.51%		PROVIDE MORE PARKING!1
1	0.51%		Put more or even fix the housing on the Gorham campus before putting it on the Portland campus. It shouldn't be mixed up in two different places
1	0.51%		Put the Freshman there so we can actually have enough housing for the students who are already going.
1	0.51%		Since the majority of classes are in Portland, having housing options in Portland makes sense. Since Portland is a metro area there are a lot of opportunities for community building activities for Portland campus residents. I've found that the Gorham campus doesn't have a lot going on as far as activities and events, it's very boring and far away from where all of my classes and events are located.
1	0.51%		Something needs to be changed with housing. It is not fair to have returning students (who pay and have been paying to go here!) put on a wait list for housing. That's a great way to lose business, especially from out-of-state students. Also, if the amount of students is going to continue to increase, something needs to be done about the amount of parking on both campuses. There is simply not enough space for all of the students that have been accepted to this school.
1	0.51%		Stop offering housing when you dont have any. There is no room. Also the name change sucks. I really love upperclass but having overcapacity rooms is not okay.
1	0.51%		Students need their own bathrooms room and bedrooms; a studio with these two things is a must . Rent should not exceed 600$ per month; the aim of such projects should be helping students not raising funds Summer should be offered with lower rent; students should feel stability the whole year; they should not be expected to move under breaks and be homeless!!!
1	0.51%		Suggestion: apartments for 1 or two people, "efficiently" sized.
1	0.51%		Sure, let's solve our lack of housing by admitting even more students we can't house past freshman year and then eventually splitting up the campus community entirely between campuses
1	0.51%		The bathrooms in Anderson are great with one exception. The shower heads are angled (and unable to move) extremely close to the wall so you basically have to hug the wall to shower, and only 2/6 (one in each bathroom I've learned) is actually a good water pressure. Please, fix this for incoming students.
1	0.51%		The current configurations don't really meet the affordability needs of students. I understand that in order to build housing the prices need to go up but on-campus housing should be more affordable than off-campus housing. The configurations shown are the same price, if not more, than current off-campus housing.
1	0.51%		The fact that this school is trying to bring on more students BEFORE they fix the housing issue they have with their current students feels reckless, and quite frankly irresponsible. Myself, as well as many others I know, tell all prospective students about the terrible housing situation, the terrible parking situations, and how there are juniors on campus who still won't have housing next year because of the system you have in place. If the school wants to bring on more students, great. The school needs to be more appropriately driven in fixing these problems. As a member of the student body, I can tell you for certain we are all very agitated with how administration is handling the overcapacity. Your current students feel abandoned, forgotten, and that our voices do not matter. And this is all just about housing. Let's not get into how the majority of Gorham residents feel about the name change (which, was to bring on more students, right? How is the school going to handle even more when it can't appropriately handle what they have now?)
1	0.51%		The fact that this school, is asking us how the living situation is on campus, is honestly appalling to me. The lack of knowledge and observations that have been made by those in charge, especially the president, is shocking. At the beginning of this school year, Glenn Cummings sent out an email, happily proclaiming that we were at "127% capacity!" as if it was a great thing. It may be for him, and the staff, and all the money they rake in, but not for the students. People have been crammed into forced triples, quadruples, and MORE. Having situations where people need to be tripled up is common in college, but to this extent is insane, and honestly, unhealthy. Not to mention that the housing on the Gotham campus is sub-par at best, with outbreaks of bed bugs, uncleaned shower spaces, a lack of supervision (young adults attending college need that too!!) and just an overall untimely lay out. Housing in Portland is a good idea. It is. As a nursing student, all of my classes are in Portland, and it would be ideal- that being said for a lot of students. But we also need housing in Gorham, as well. How about we take away the idea of changing the name (which is only going to cause confusion. We have 3 campuses. The campus that is so important to be put into the title, doesn't even have rooms for students to live. Sounds poorly thought out, poorly budgeted, and honestly, irresponsible.) and put that money into restoring the two, perfectly good buildings that stand beside Philippi, and make them into more dorms? Doesn't that seem more practical. Lastly, I would like to point out that I, along with witnessing several other current students, persuaded prospective students that attended on

			Accepted Student's Day, to not come here. I wish someone had told me, sometimes. The housing is poorly managed, dirty, and unsustainable for the community already living there. I told them how we ran out of dorms for the students who already lived here, which is not only atrocious but embarrassing. I sincerely hope my comments, and the comments of other students, are taken to heart. This school claims to be the University of Everyone, yet a majority of the student body's thoughts and suggestions are ignored.
1	0.51%		The housing at USM is horrendous. Why the fuck would you accept more students than you have room for? I am a freshman and was looking forward to living in an upperclass hall, but before I was even able to access the lottery, housing was all filled up. I am now forced to live in an apartment next year, if I had known I wouldn't have a place to live, I would have transferred from USM.
1	0.51%		The housing at USM should at least be affordable to students of all races. Right now, oncampus housing is more relaiable to students living in states.
1	0.51%		The housing is nice on the Gorham campus, I just wish a lot of it was cheaper and it was available more. I barely got into Philippi for next year because so many students were trying to get in. It's so important to have enough housing for everyone.
1	0.51%		The housing USM has now is not sustainable, students resent the Maine School system, they resent Res Life and they resent President Cummings. The comments and complaints are not a joke, the memes are not harmless, students feel mistreated and robbed by the housing conditions and I agree. As a student and RA I can say with certainty that the housing crisis is pushing residents away, it's forcing students to settle for unacceptable living conditions that are in no way compensated with reduced costs.
1	0.51%		The majority of students that attend usm are commuters. Additionally, the majority of students that commute use Portland as their primary campus. If these individuals needed housing, they would currently live in a dorm. However, these students choose to commute- probably to save money and they live near by anyways. The students who primarily need housing are those who either live far away, play sports and need access to Costello, or both. So, a if a campus were to get housing, it should 100% be Gorham. Everyone who needs housing next year would agree, and they are upset that receiving a room next year has been extremely difficult with the influx of new students.
1	0.51%		The only deterrent from living on campus my junior and senior years (aside from financials) was the constant interference from USM residential life. I'm sure some students appreciated the regular checkups (husky huddles) and RA inspections and quiet-time, but for me it felt almost oppressive. As adults making important life decisions, we should have the option to live a more solitary lifestyle if we so choose. I understand the need to check for drugs and underage drinking, that was fine. But the mandatory floor meetings and the like became annoying. Even though it was less convenient and ultimately more expensive, living off campus became the only way to assume a social life without interference from Reslife. My apologies for sounding rude, I am just explaining my decision.
1	0.51%		The option for student housing on or near USM Portland campus is very appealing and would be easier than commuting from Gorham because most of my classes are on USM Portland campus. I can anticipate the lack of parking nearby bearing an issue as Portland is more limited in this sense.
1	0.51%		The prices mentioned earlier for Portland housing are pretty high.
1	0.51%		The rental prices are WAY too high. I am from Portland and I know that a four bedroom two bath with a tiny kitchen and living room does not cost 950-1050 per month per person unless you are in the east or west end. the oakland area near usm is probably 600-700 per month per person after utilities and Libbytown is cheaper. If you charge 950-1050 per month per person for anything other than a one bedroom in the Portland USM area, you will be ripping off your students.
1	0.51%		There has to be more housing available for students. As of right now there are students who will not have housing because the school over books and they plan to bring more students in by changing the name... lets spend that money on making more housing and parking for the students who are already here. Stop over booking, there isn't room for them. Also the meal plans... have a no meal plan option, and have a meal plan that actually allows students to have a meal three times a day for seven days. your max is 19... add two more meals, why wouldn't you.
1	0.51%		There need to be more housing and returning students should have priority over new students.
1	0.51%		There needs o be more Gorham housing and priority needs to be for freshman and sophomores not juniors and and seniors
1	0.51%		There needs to be more affordable housing and parking on both campuses
1	0.51%		There needs to be more parking available on the Portland campus. Or housing available to limit the amount of traffic in the area.
1	0.51%		There should also be a focus on renovating the current living quarters on the Gorham Campus.
1	0.51%		There should be more apartment style living options.

1	0.51%		Think it’s a good idea, and a good way to spend resources instead of changing a name that’s working fine.
1	0.51%		This is the most important thing USM could do to provide a better experience to students. The current over population in Gorham housing leads to more people moving off campus, more people not choosing to return to USM and not rproblems for reslife staff
1	0.51%		This survey was set up terribly. There is no reason to have 20 possible answers to a single question; it’s sloppy and inefficient. Add to that at least one question where “choose all that apply” only allowed for a single response. I do truly think that having housing on or near the Portland campus is important, but maybe instead of paying this consulting firm whatever fee they’re extracting from USM, the money could be used to build this needed facility - or better yet, maintain and update the existing academic buildings where the people who pay the administration’s paychecks earn their degrees.
1	0.51%		This survey was very long!
1	0.51%		This will be important especially for those who only have class in Portland.
1	0.51%		Tripples were awful and dorms were not worth the money. RAs were rude and too many rules. Also the parking is not good at all and required meal plans are annoying and a waste of money. There is not enough housing for returning students to get the housing on campus they want.
1	0.51%		USM lacks graduate living spaces. This really hurts USM compared to other universities.
1	0.51%		USM must have more housing. I know many people who do not have the ability to attend next year due to lack of housing, so they must change schools or drop out. Maybe fix the esbestos dorms until you can get portland housing if you have to, because this is not okay. This is bad for our school. Portland housing is a MUST, even if it costs more.
1	0.51%		USM needs GORHAM housing on the GORHAM campus. Portland is overpriced, not enough parking, and full of unsafe factors. The primary campus people spend the most at is GORHAM. The fact that the university is tripling students and/or kicking them out of the dorms because there isn’t any room left is absurd. And here we are changing our name for like a huge sum of money when USM can’t even focus on its students living. How are we to invite more people into USM when we can’t even provide housing for the current students? Thank GOD I didn’t have the deal with the bullshit housing system at USM or else I wouldn’t have gone there. Living off campus was the best and only choice for me but for others that’s not possible. GET MORE DORMS. GET MORE HOUSING IN GORHAM. That’s literally the the STUDENTS want at USM, and that is dorm rooms that aren’t packed in like section 8 housing.
1	0.51%		We need it.
1	0.51%		WE NEED MORE PARKIN EVERYWHERE!
1	0.51%		WE NEED PARKING CLOSER TO ANDERSON I GET BACK LATE FROM CLASSES AND FEEL UNSAFE WALKING FROM MY CAR THAT I HAVE TO PARK ACROSS CAMPUS. Also, I’m allergic to dust and mold and had a major asthma attack from being in Robie Andrews for a very short time, so that should probably be looked at. Not sure if this is the right place to put this but I’m gluten and dairy free and there’s no breakfast options on the Portland campus for me at all and that’s not okay either.
1	0.51%		Well considering I need on campus housing and I can’t get it for next year because of lack of housing I believe it is a good idea to have more housing
1	0.51%		When considering housing in Portland I think it should be important to consider teaching young people progressive ways to live in a city. There should be an intentional theme incorporated into the housing options. The building should manage waste in the most conservative way possible, ie recycling, composting, etc. There should be renewable energies utilized and highlighted as a means of teaching undergrad or grad. The building should incorporate public transportation, ride shares, and bike share models. There should be parking for only those with needs like commuting to jobs outside of walking distance.
1	0.51%		When is it coming?
1	0.51%		While I have no desire at my age to live on a college campus ever again. I will say that during my undergraduate studies I would not have gone to college that didn't provide on-campus living. At 17 years old I was not ready to live in an apartment, and couldn't afford a car to live off campus anyways. That being said, I was pretty surprised to find out that USM doesn't offer on-campus living at the Portland Campus. I wouldn't have been happy to commute from Gorham either. Half the fun of being a 17/18 year old is living on the campus where you go to school. Especially in downtown Portland area. I feel confident in saying that if you had Portland campus living available, the school would see an increase in students wanting to attend.
1	0.51%		While I selected two and four bedroom apartments as my preferred housing options for the second and third year of my program, the prices for those are just as high as other apartments I can't afford to rent in Portland. I realize there's a need to match market rates, but market rates in Portland have moved out of the price ranges of many students and working adults. $1100-1200 for a bedroom in an apartment is just too much for me, regardless of where it's located. If that is the total cost split between all roommates, that

			would be considerably more affordable, but it wasn't clear in the survey...
1	0.51%		Would be fantastic to have more student housing. Off campus housing is very scarce and expensive.
1	0.51%		would prefer commuter housing options as I don’t need on campus housing all the time just on an as needed basis or in emergencies when there are storms. I commute 2 hours 1 way from Winslow to gorham 2 days a week. There aren’t any hotels in Gorham that Im aware of, maybe there is air bnb.
1	0.51%		Wow, that was a lot of questions to get to this point of the survey. I'm going to be as candid as I can with my opinion. USM especially the Portland campus has a ton of commuter students. Some are older, some are straight from high school, heck I have had high schoolers in a few classes of mine! I originally attended USM immediately after graduation from high school. I commuted to the Portland campus 4 days a week for the first semester. This survey and proposed housing in Portland makes it seem like commuter students are undervalued. We pay tuition, we do our part, and then we leave campus so we don't need any RAs or extras. Setting up additional housing for students is going to cost a lot of start up money, and tie up a lot of money in housing long term. I don't think tuition rising much more will help the UMaine system. Most students I talk to come here because it is a good blend of affordable, a good education, and a good reputation. I can't imagine USM setting up housing near the USM campus and it going well in the short term, however if the school could wait until another downturn in the housing market perhaps they could capitalize on a bit cheaper of real estate in the area. Living in Portland is very expensive, and the dorms if they were built shouldn't be unreasonably priced. This survey must not be anonymous due to the "prizes", regardless I'm open to discussing possible ramifications, ideas, and solutions about this idea. (Ronald.Murray@maine.edu)
1	0.51%		You should fix Gorham living situations/ the buildings before attempting this mess

195 Respondents

USM Parking Assessment: Existing and Future Conditions

Presented by
LOURENÇO DANTAS, AICP
FEDERICO TALLIS, AICP

January 17, 2020

Contents

- Study Purpose
- Current Parking Supply
- Future Parking Supply
- Current Parking Demand
- Enrollment and Parking Demand Forecasts
- Future Parking Supply vs. Demand
- Key Takeaways
- Appendix
  - Parking Demand by Lot/Facility
  - Proposed USM TDM Strategies

Study Purpose

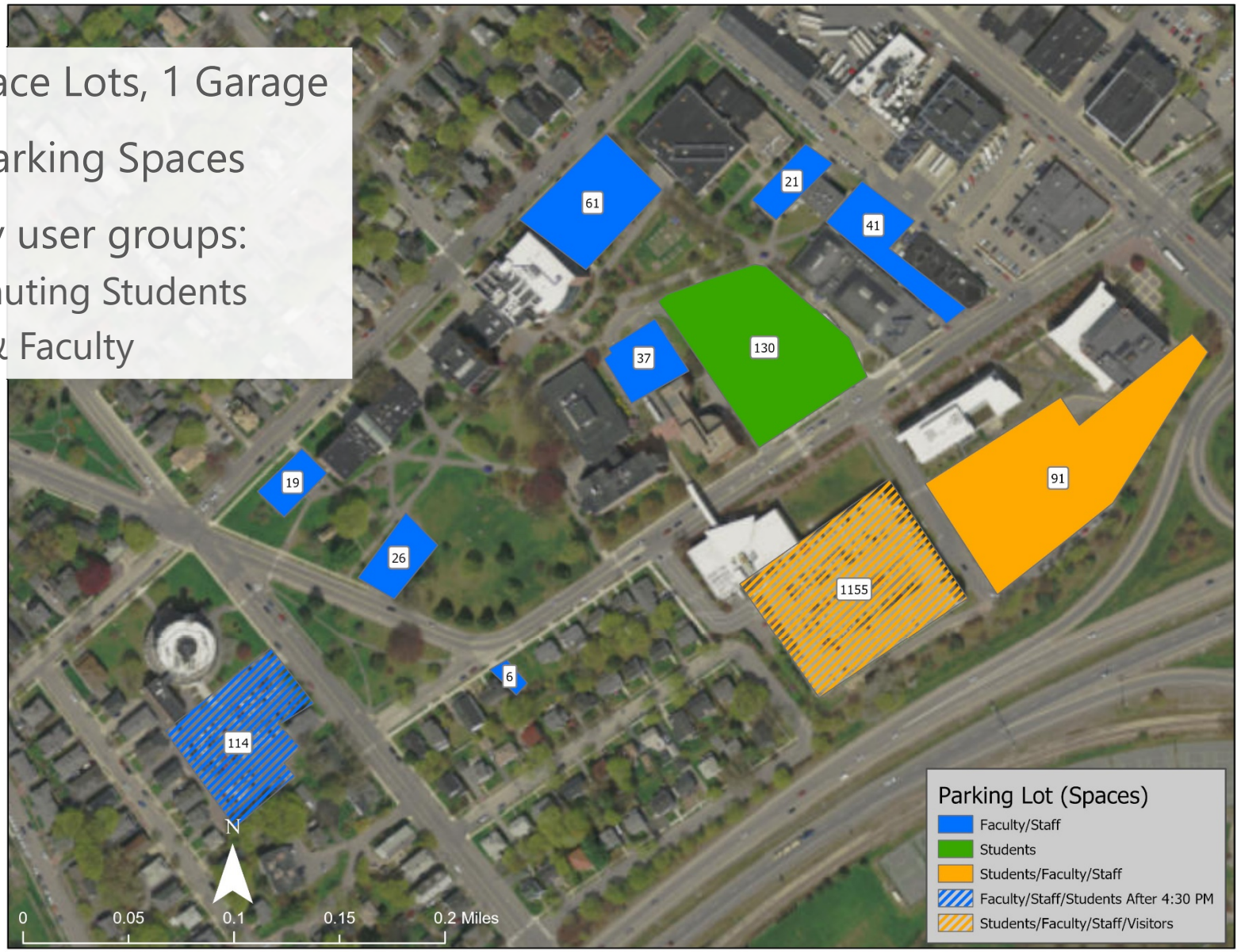
To develop a comprehensive profile of current on-campus parking conditions and to estimate future parking demand levels based upon projections of student enrollment, employment growth, and changes to campus activities.

Key milestones include:

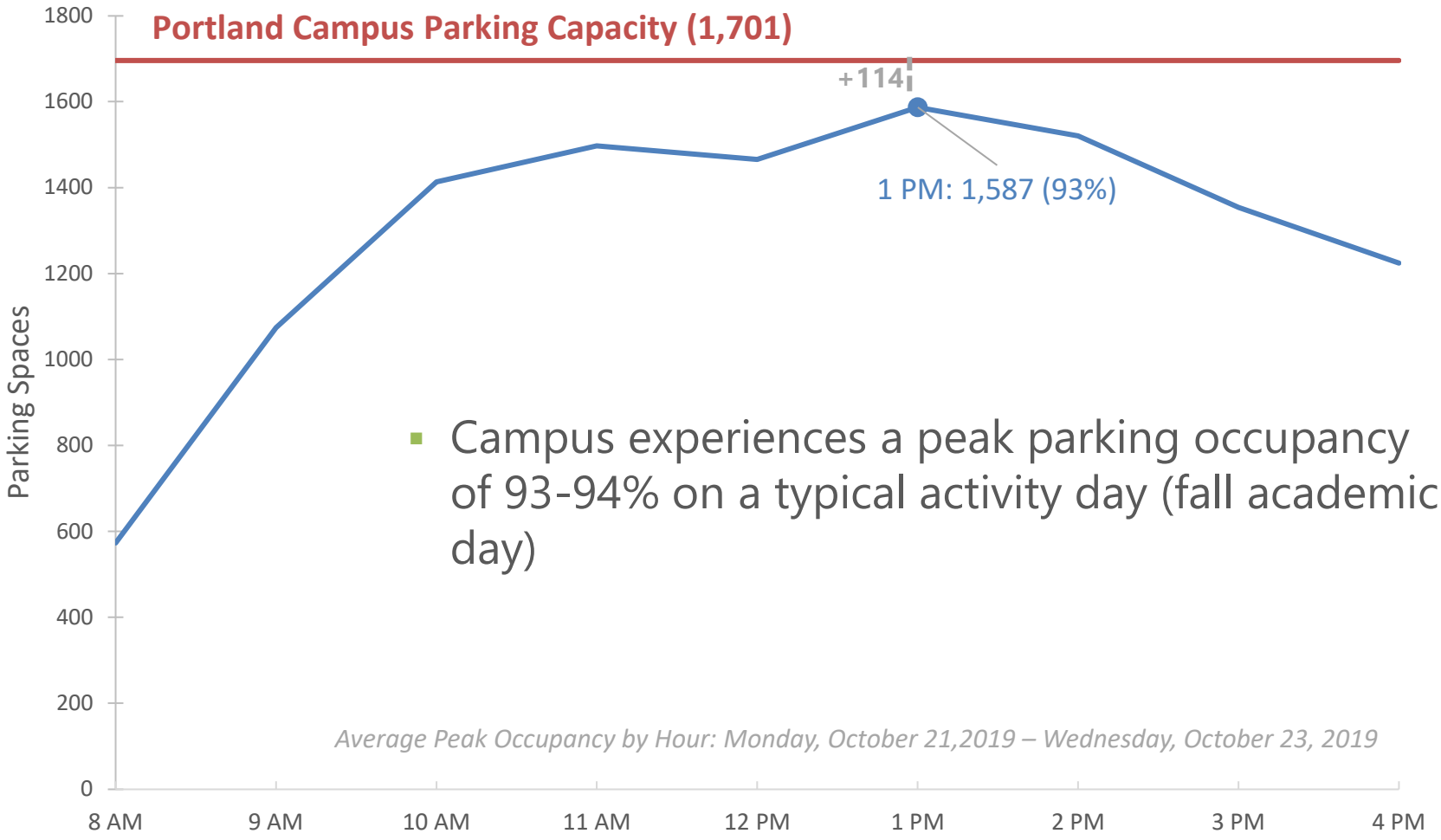
- 2022 – completion of student center & residence hall, including loss of Woodbury parking lot (P2)
- 2025 & 2030

Current Parking Supply

- 10 Surface Lots, 1 Garage
- 1,701 Parking Spaces
- Two key user groups:
  - Commuting Students
  - Staff & Faculty



Current Parking Demand

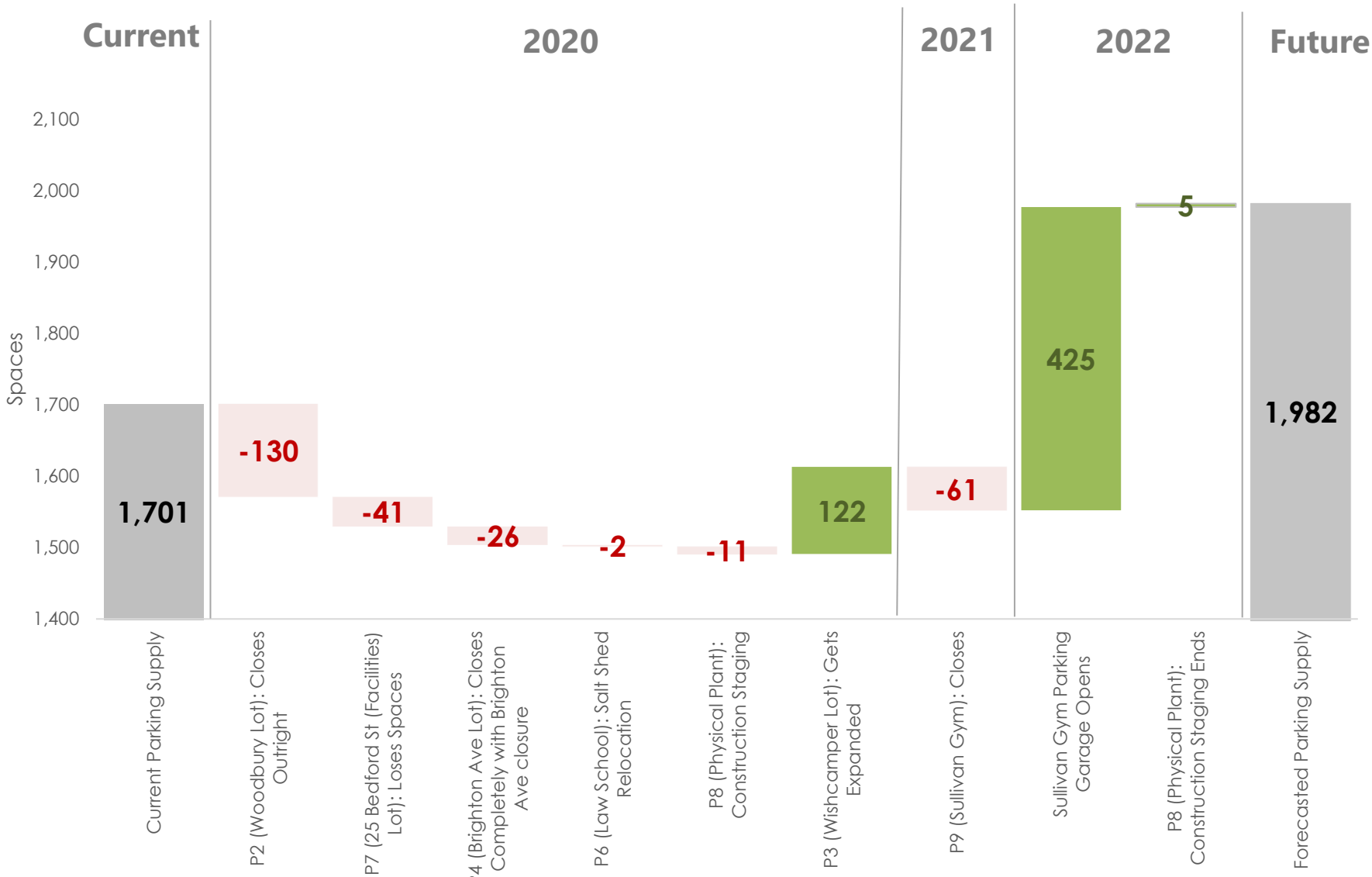


- Campus experiences a peak parking occupancy of 93-94% on a typical activity day (fall academic day)

Current Parking Demand

- Current Parking Peak Hour occurs at 1 PM
- Campus is currently at 93% occupancy during peak, typical activity day
- 5 of 11 lots noted occupancy beyond capacity (see details in appendix) including:
  - P2 Campus Center (Woodbury Parking Lot)
  - P3 Wishcamper Center/Library
  - P4 Off Brighton Ave
  - P5 92-120 Bedford
  - P10 Payson Smith

Future Parking Supply



Future Parking Supply

On-Campus	2019	2020	2021	2022	Milestone Notes (from USM)
Parking Garage	1155	1155	1155	1155	
P1 Luther Bonney & Masterton Halls	37	37	37	37	
P2 Campus Center (Woodbury Parking Lot)	130	0	0	0	Lose all of Woodbury parking lot permanently
P3 Wishcamper Center/Library	91	213	213	213	Wishcamper parking lot will be temporarily lost for the summer 2020 Gain 122 spots in new Wishcamper surface lot by September 2020
P4 Off Brighton Ave	26	0	0	0	Lose Brighton Ave extension parking lot by May 2020
P5 92-120 Bedford	6	6	6	6	
P6 Law Building	114	112	112	112	Salt shed being relocated to this lot to make way for construction of new buildings
P7 Facilities Building	41	0	0	0	Lose all of this lot, except access to oil fill in June of 2020
P8 Physical Plant	21	10	10	15	Lose half of this lot in 2020 and 2021 for use as a laydown/staging area for construction of new buildings and creation of service area
P9 Sullivan Recreation	61	61	0	0	Lose lot to construction zone for new parking garage
P10 Payson Smith	19	19	19	19	
USM Sullivan Lot Garage	0	0	0	425	Parking garage with 425 spaces
Total	**1,701**	**1,613**	**1,552**	**1,982**	

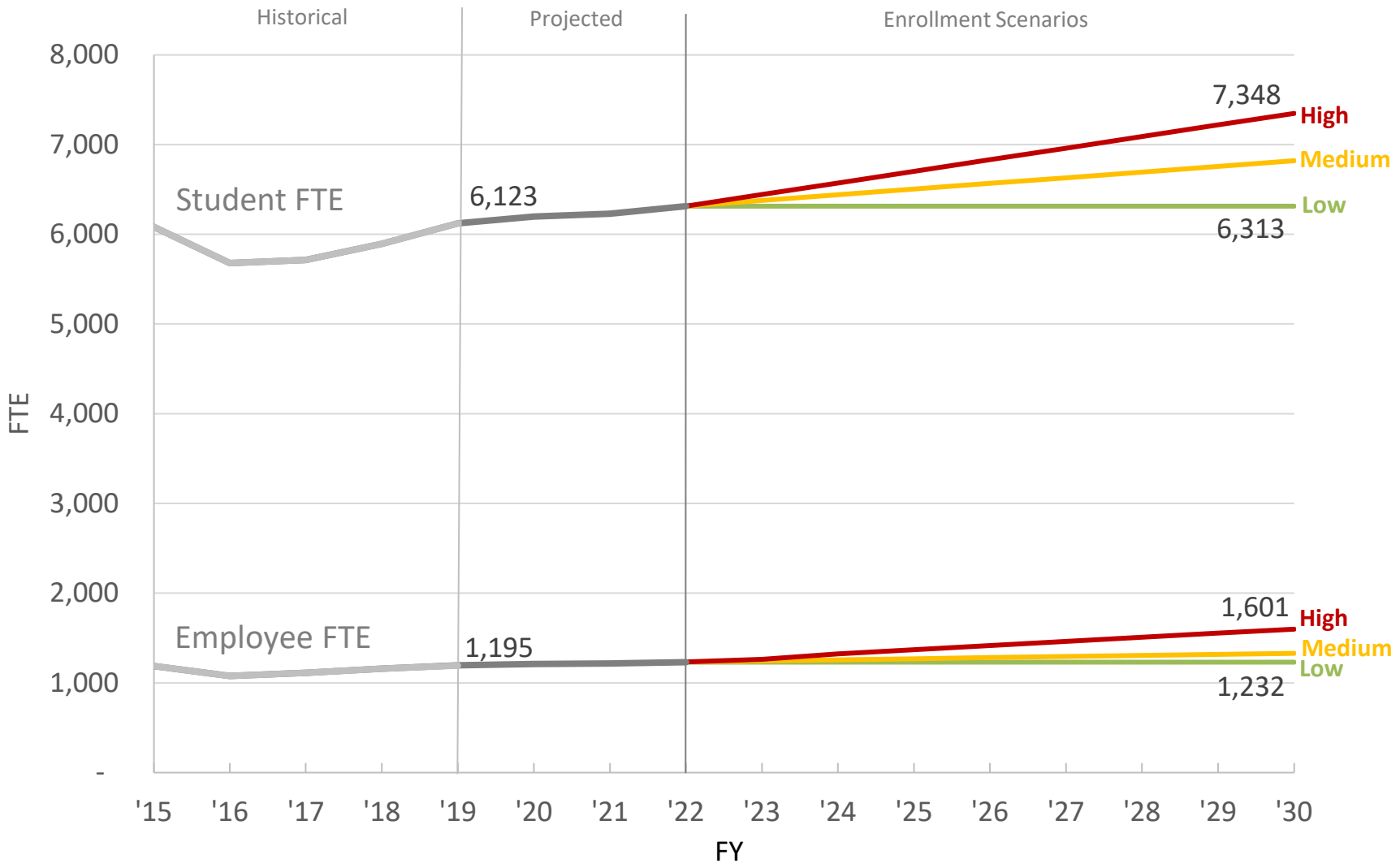
Enrollment Forecast Methodology

- What we know:
  - 2019 Student and Employee FTE
    - Student FTE: 6,123
    - Employee FTE: 1,195
  - Projected Student Growth Through 2022
    - 2020 Student FTE: 6,199
    - 2021 Student FTE: 6,230
    - 2022 Student FTE: 6,313
- What we don't know:
  - 2020 – 2022 Employee FTE
    - Employee FTE was grown proportionally to student enrollment using 2019 ratios for 2020 – 2022; could have a different growth rate
  - How USM will grow beyond 2022

Enrollment Forecast Methodology

- To determine demand beyond 2022 three scenarios were determined:
  - **Low:** Student enrollment and employment remains flat beyond 2022
    - Average Annual Growth Rate: 0%
  - **Mid:** Student enrollment continues to grow steadily based on growth from 2019 to 2022. Employment grows proportionally to student enrollment.
    - Average Annual Growth Rate: 1%
  - **High:** Student enrollment and employment grows back to peak enrollment, 2006 levels.
    - Average Annual Growth Rate: 2%

Student and Employee FTE Projections



Translating Enrollment to Parking Demand

- What we know:
  - Portland Campus Parking Demand
    - Peak hour demand: 1,587 (93%)
  - USM Portland Campus Headcount vs Total USM Enrollment
    - From Master Plan: Portland has 64% of total USM student headcount
  - Employee vs. Student Parking Demand
    - From parking count, 44% of Portland campus permits are from employees whereas 56% are from students
  - Residential Student Parking Permit Demand
    - From Master Plan 1,200 beds in Gorham and 815 registered permits from permit data = 0.68 parking space/bed.
    - Based on demographic of expected student population, a higher 0.75 parking space/bed rate was used.

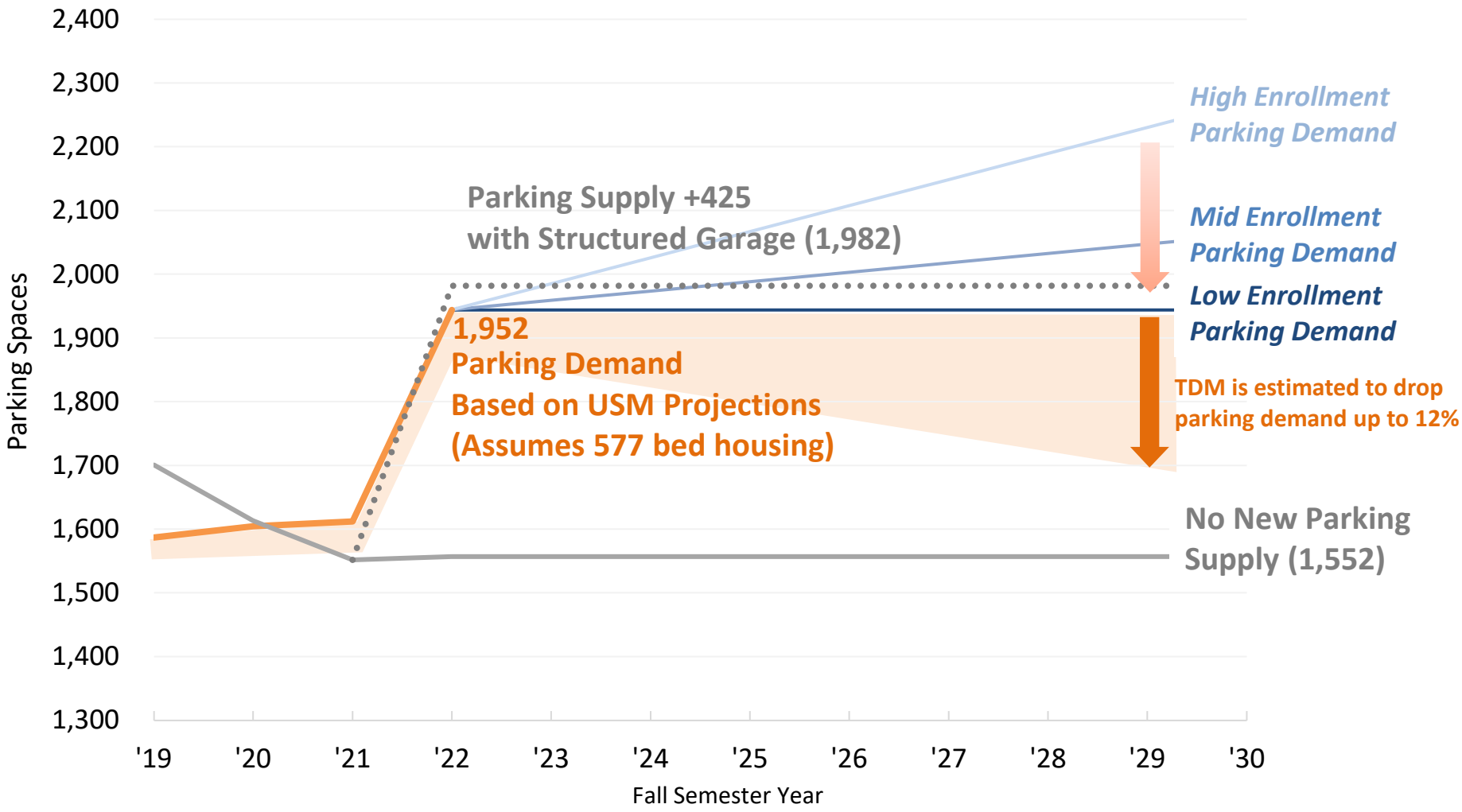
Translating Enrollment to Parking Demand

- To Calculate Parking Demand:
  1. USM Student Enrollment was translated to Portland Campus Student Enrollment
  2. For each forecasted year Portland student enrollment was split into two categories: Commuter student vs Residential student
     - 577 residents assumed on-campus from 2022 into the future.
     - Commuter students equal to total Portland headcount minus on-campus students
  3. Commuter student, residential student, employee, OLLI, and conference attendee parking rates were calculated:
     - Commuter student, employee, OLLI, and conference parking rates were calculated using existing permit demand data ratios
     - Residential student rates were calculated based on Gorham bed counts and resident student permits registered
  4. Calculated parking rates were multiplied by expected population for each year to determine final parking demand by group
  5. Final commuter student, residential student, and employee parking demand were summed to determine total parking demand

Calculating TDM Reduction

- To Calculate the impacts of a TDM program on USM:
  1. A laundry list of appropriate TDM strategies were chosen for USM based the peer review and the assessment of existing transportation conditions.
  2. Impact vs. cost of individual strategies were determined based on USM permit data sales and the transportation survey.
  3. USM narrowed laundry list from step 1 based on political and financial feasibility.
  4. VHB took final package of strategies and simulated potential mode split based on USM permit data and transportation survey.
  5. Mode split was translated to parking reduction based on existing mode split vs. parking demand patterns.
- A list of proposed TDM Strategies are contained in the appendix.

Future Parking Supply vs. Demand

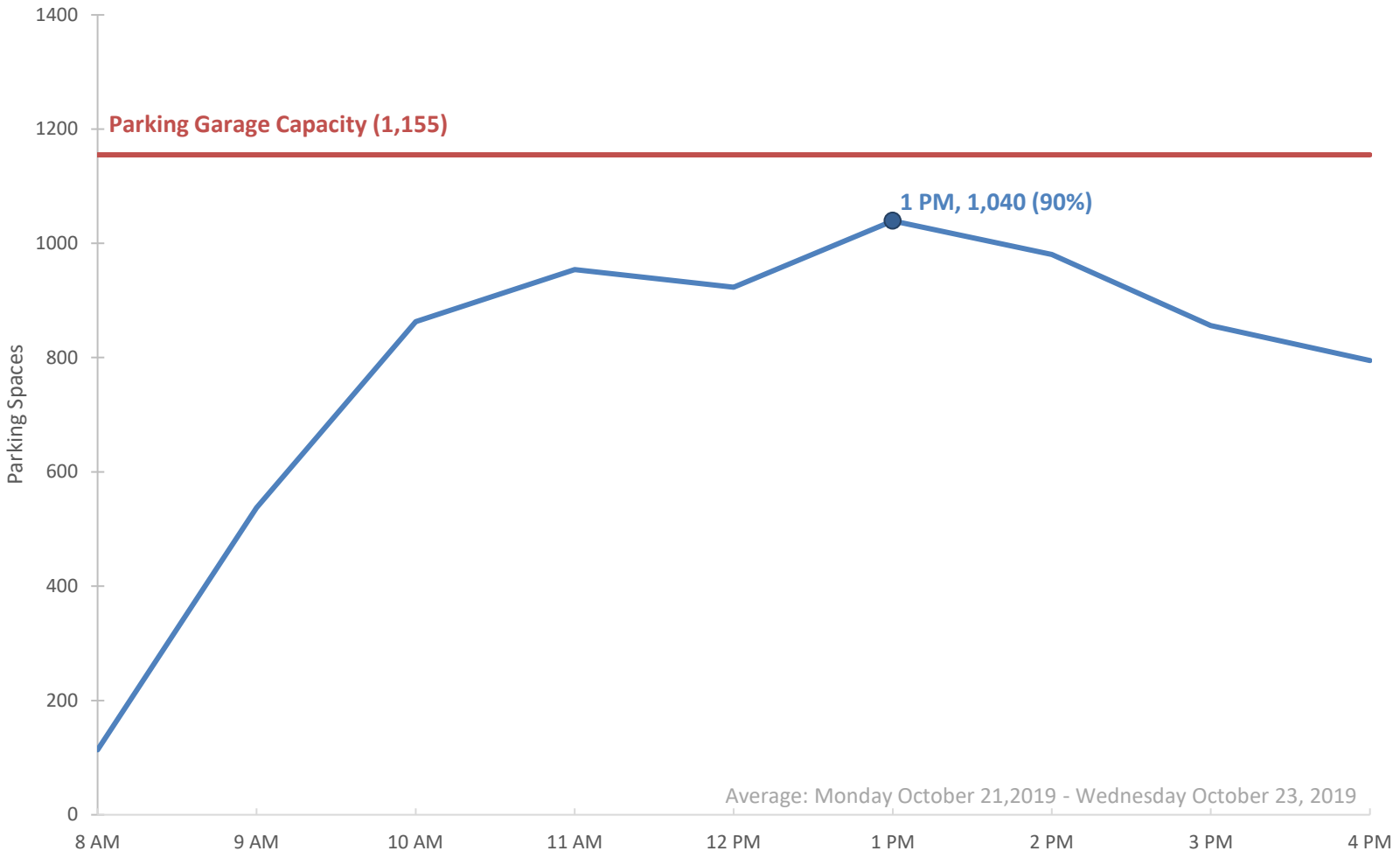


Takeaways

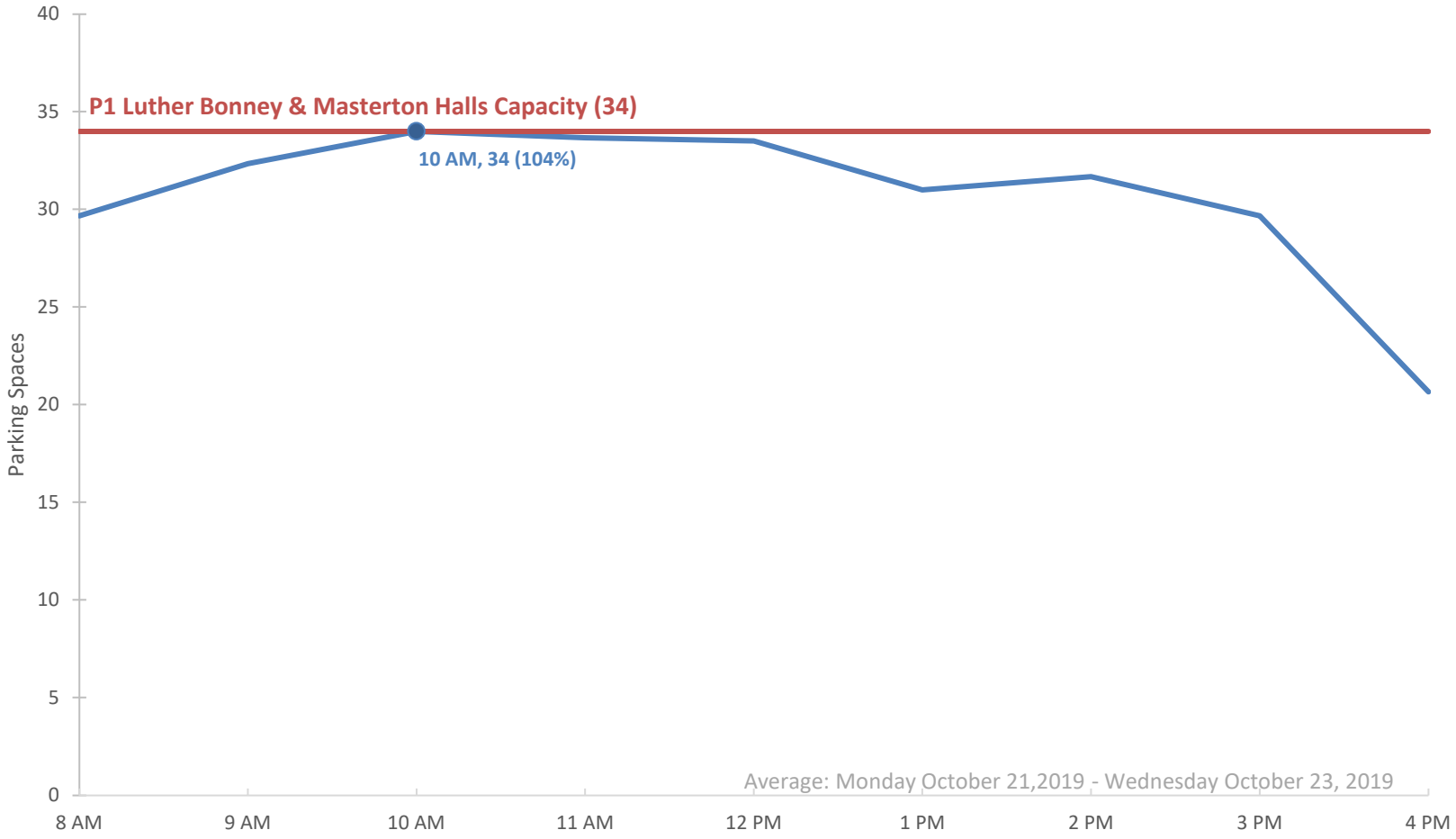
- With construction of a new residence hall and student center, new parking capacity is needed and/or parking demand needs to decrease
  - A moderately aggressive TDM program of strategies, including parking pricing and policy changes, could result in demand reductions of up to about 12 percent for USM
- Depending on enrollment projections, parking supply may not be adequate. USM would have to consider building more parking supply or further reducing parking demand
  - Not anticipated to be an issue until at least 2026 (under a modest 1 percent annual growth in student enrollment and without TDM implementation)
- Enrollment growth may not always directly contribute to growth during the peak demand hour:
  - E.g. Evening classes, distribution of classes among campuses, use of campus for conferences and at-large community events

Appendix:
Hourly Demand Charts by Parking Facility

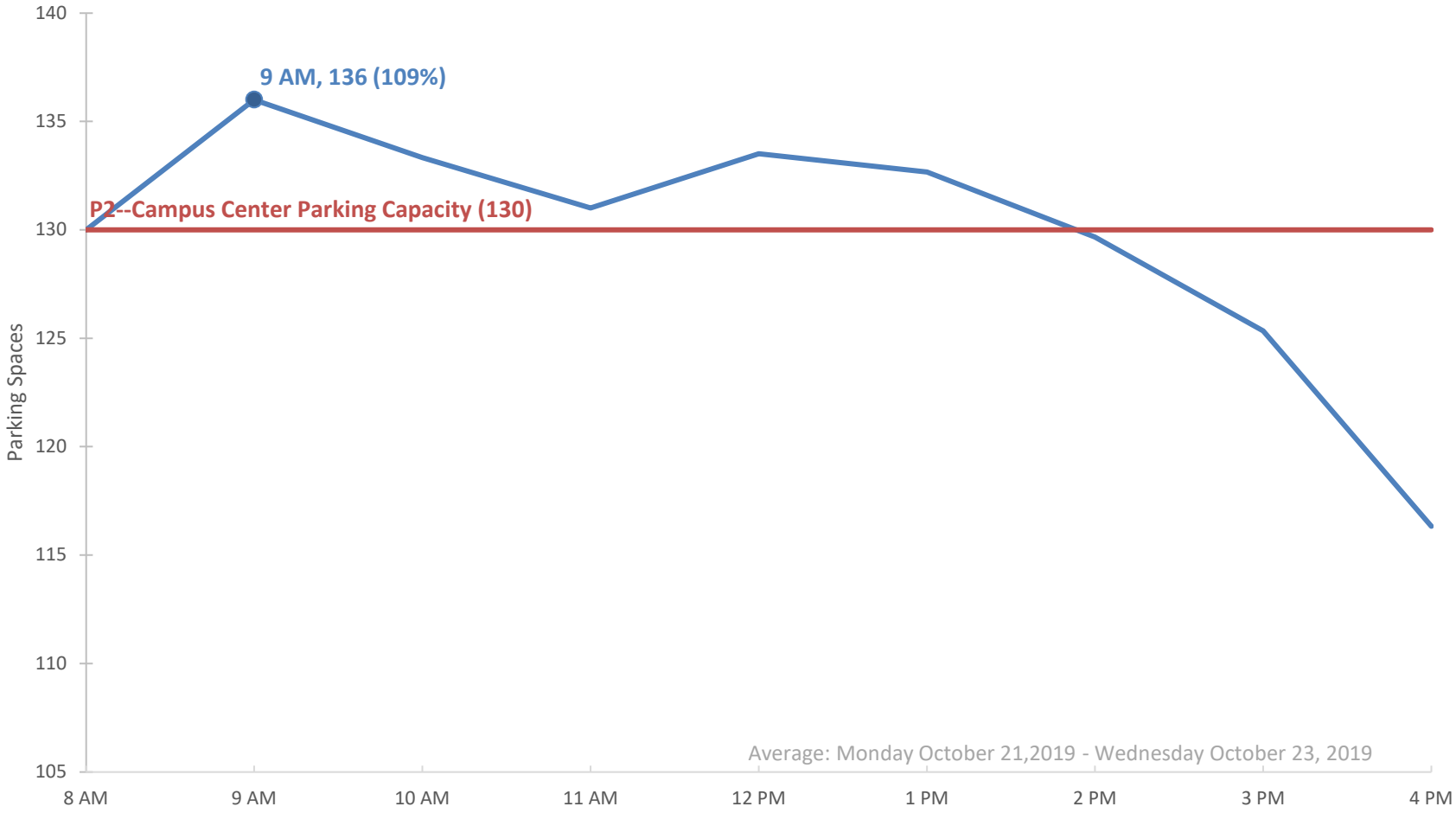
Parking Garage Demand



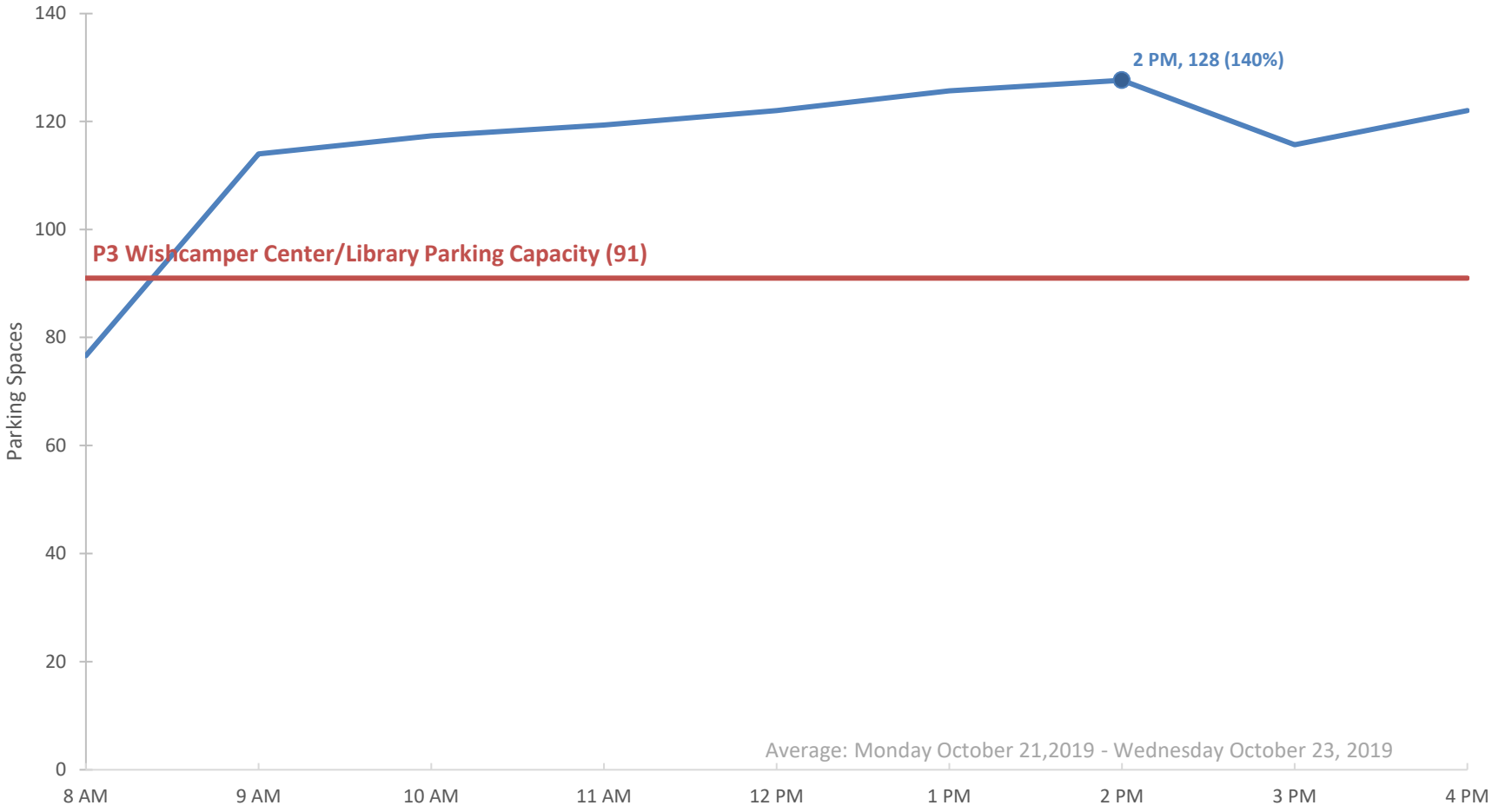
P1 Luther Bonney & Masterton Halls Parking Demand



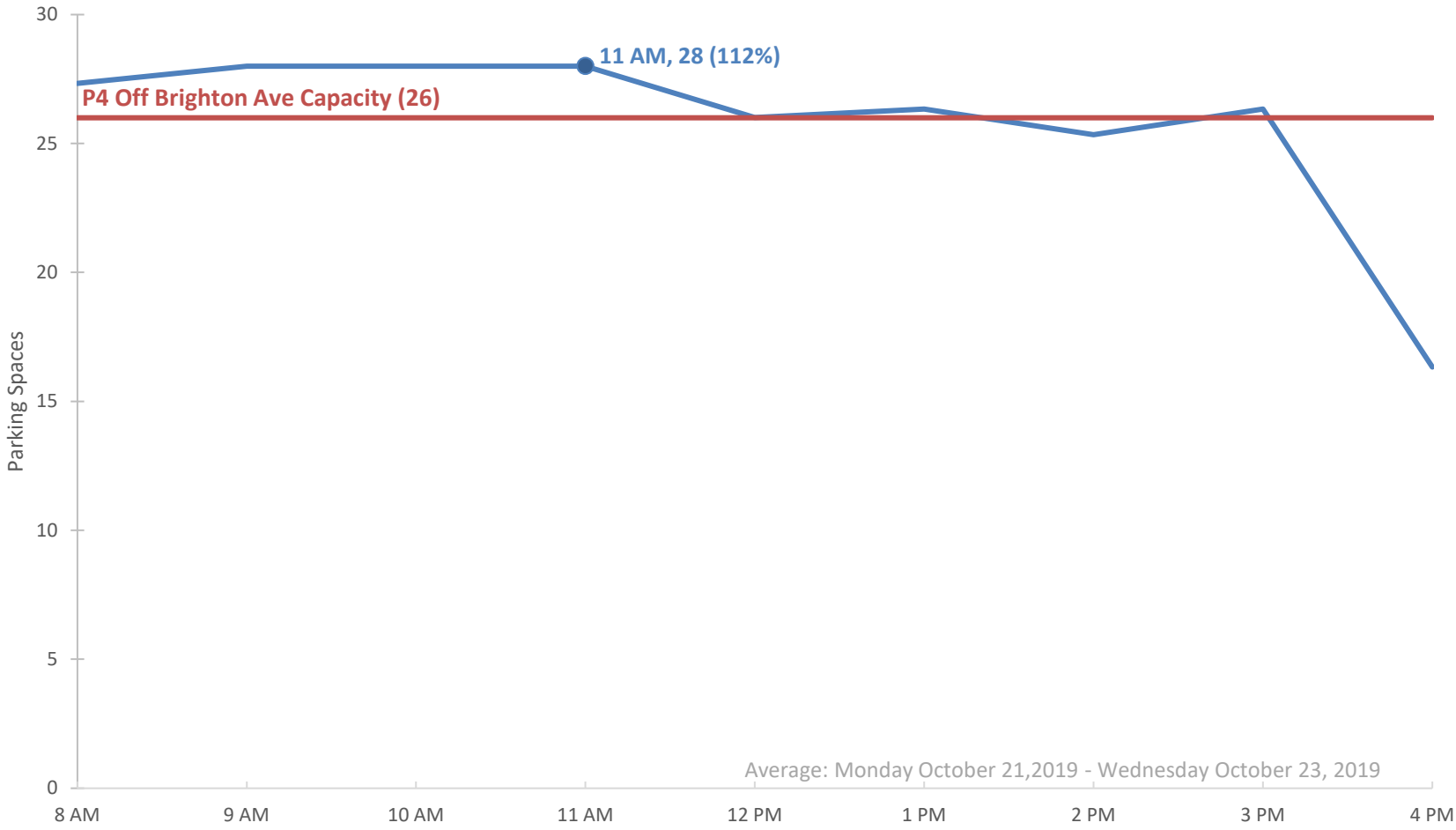
P2 Campus Center (Woodbury Parking Lot)



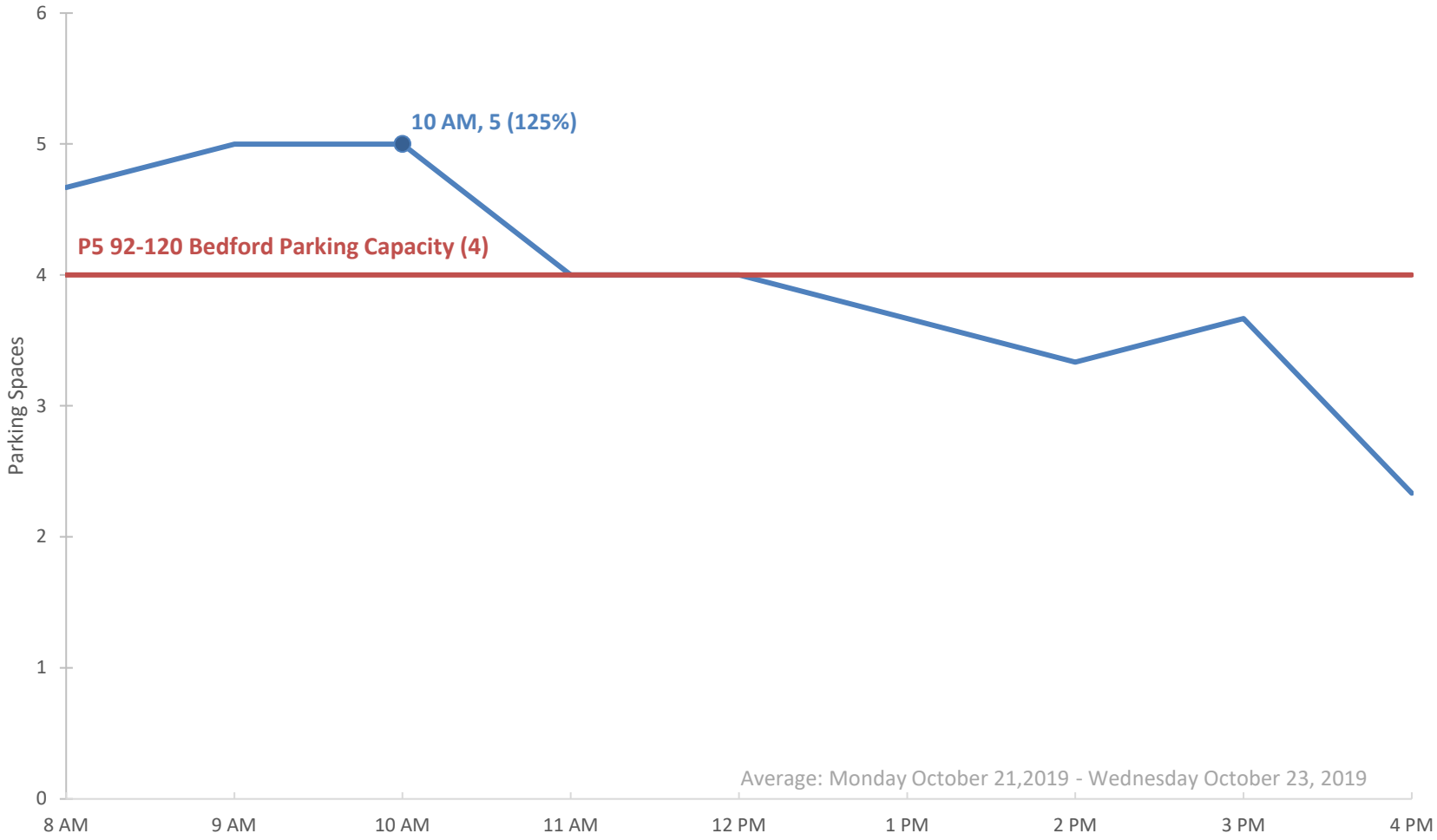
P3 Wishcamper Center/Library Parking Demand



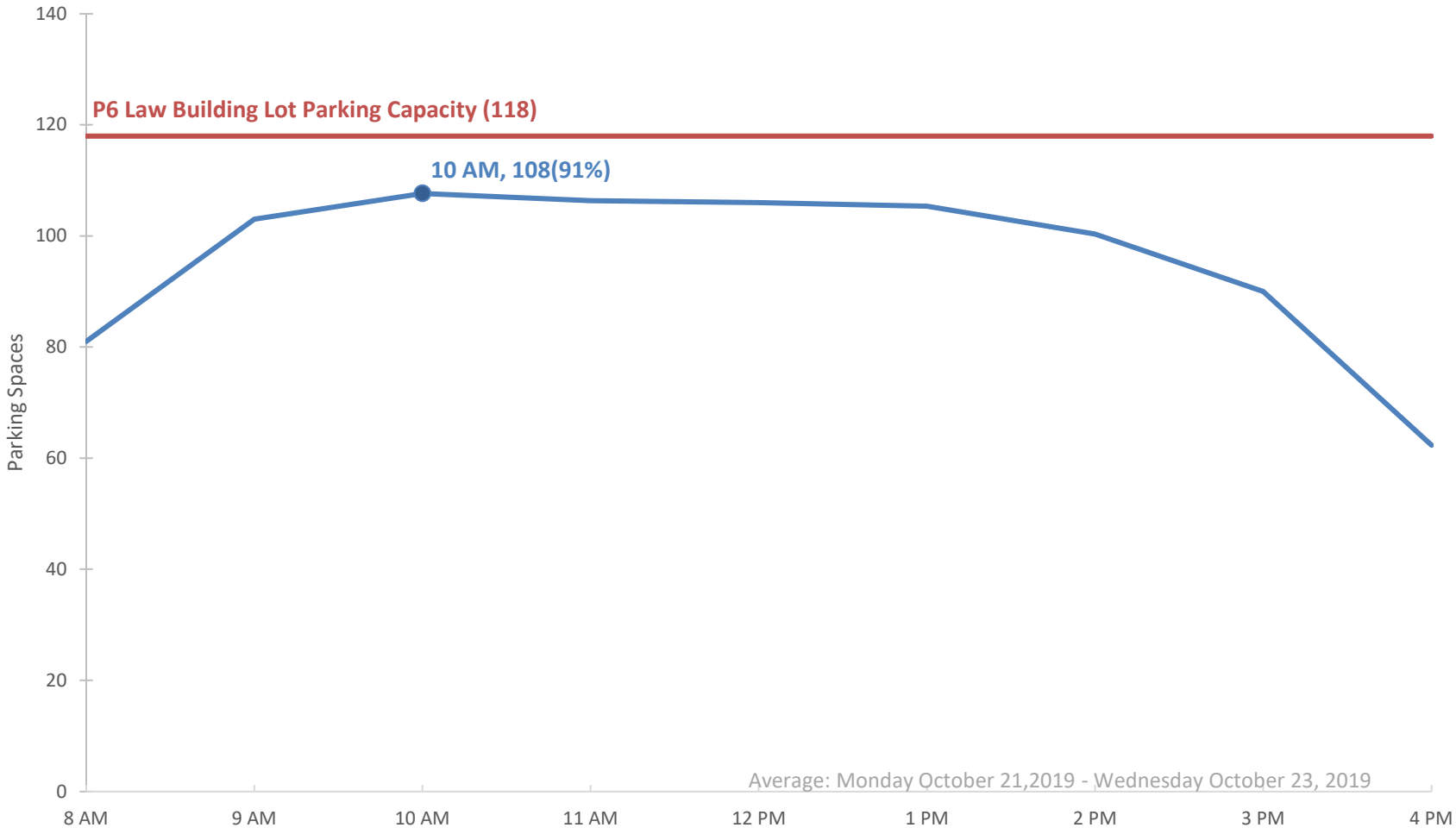
P4 Off Brighton Ave Parking Demand



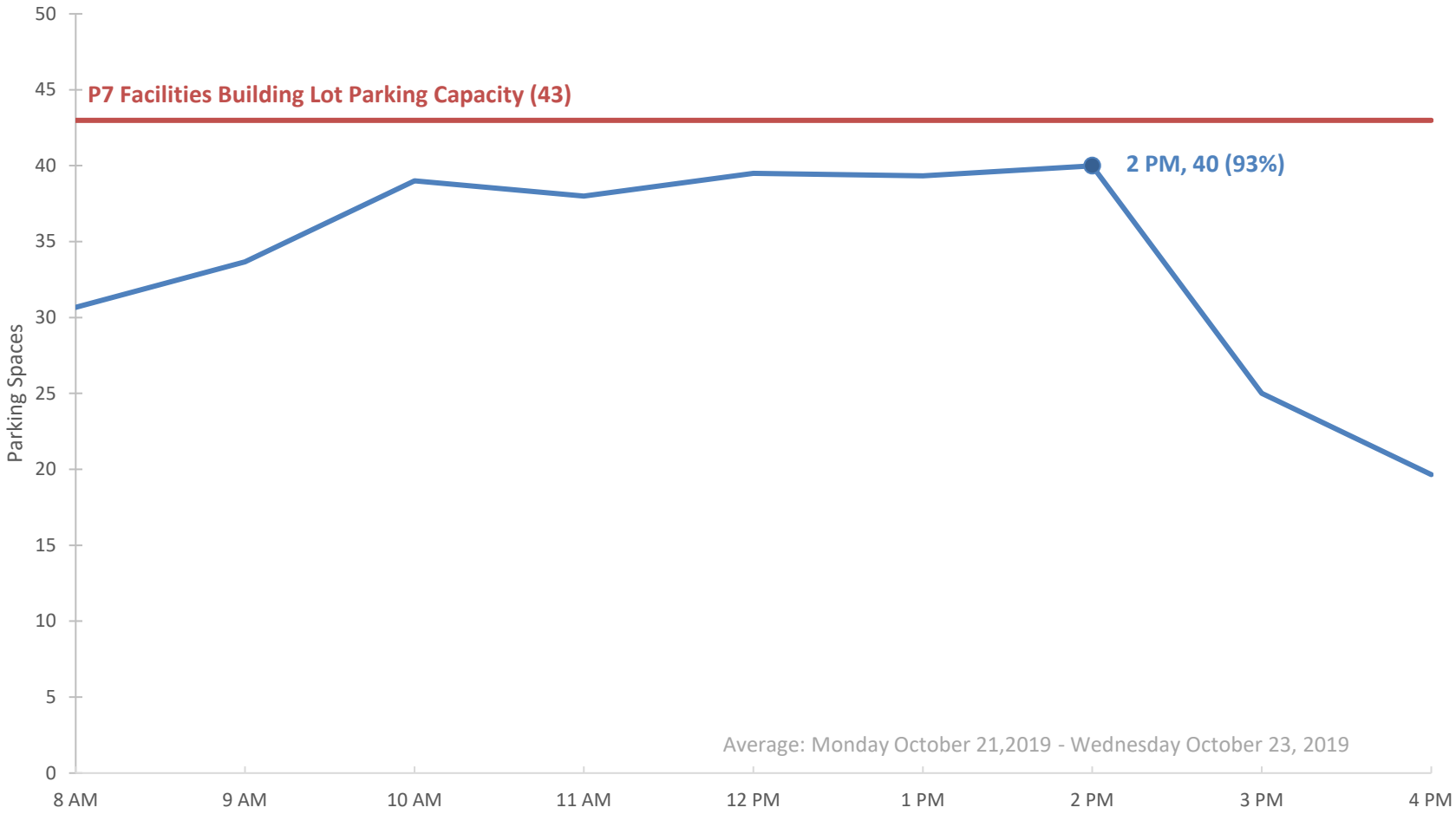
P5 92-120 Bedford Parking Demand



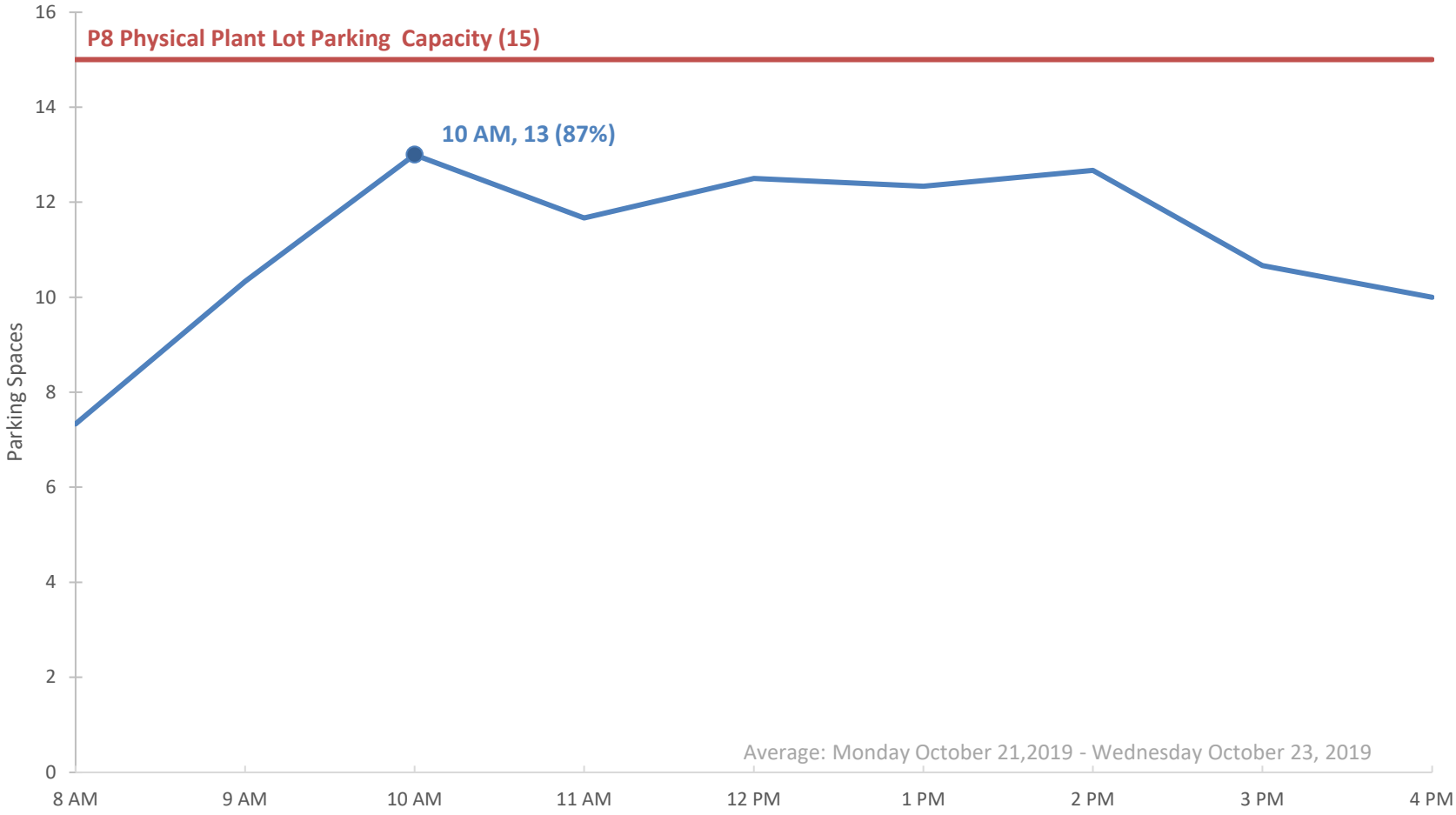
P6 Law Building Lot Parking Demand



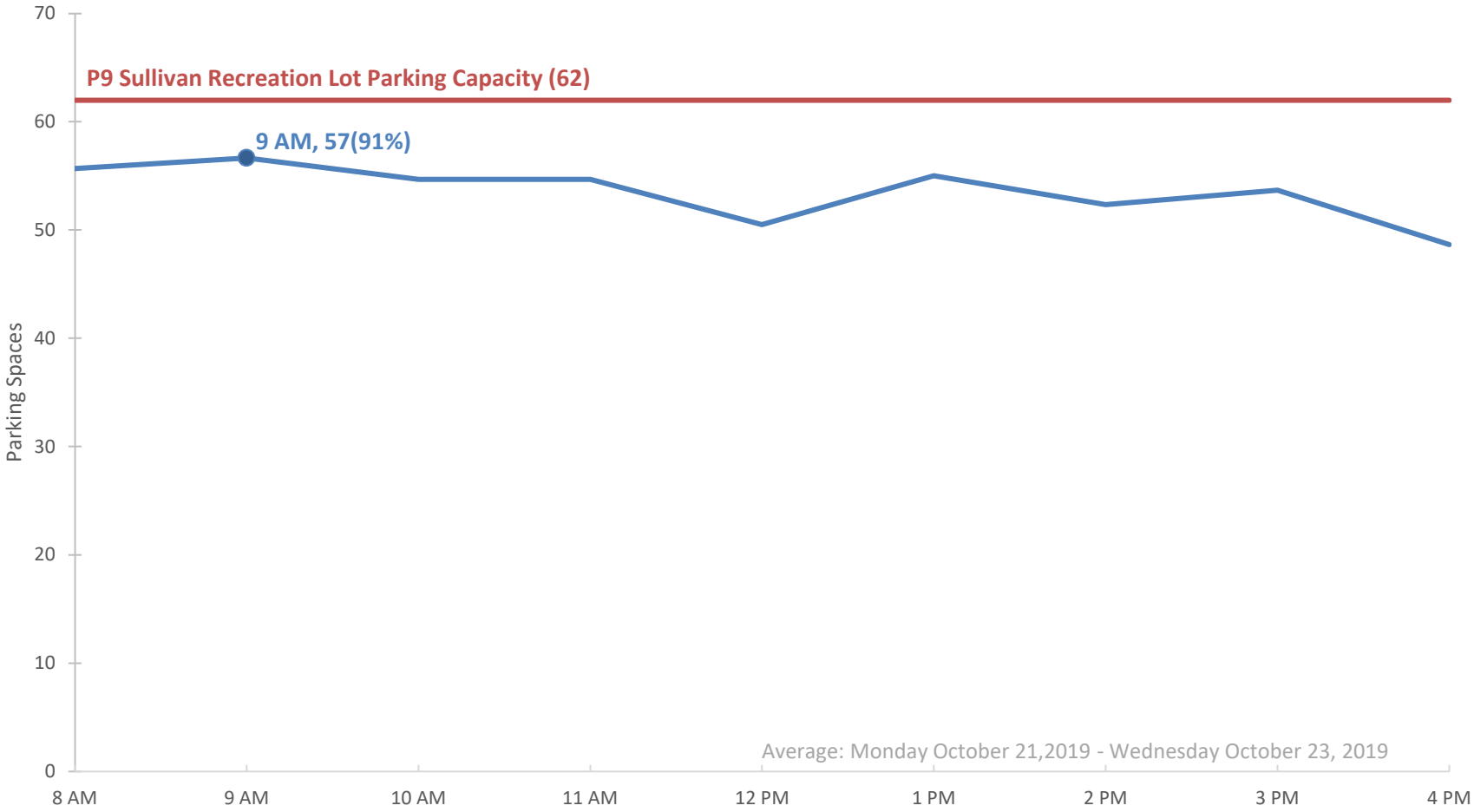
P7 Facilities Building Lot Parking Demand



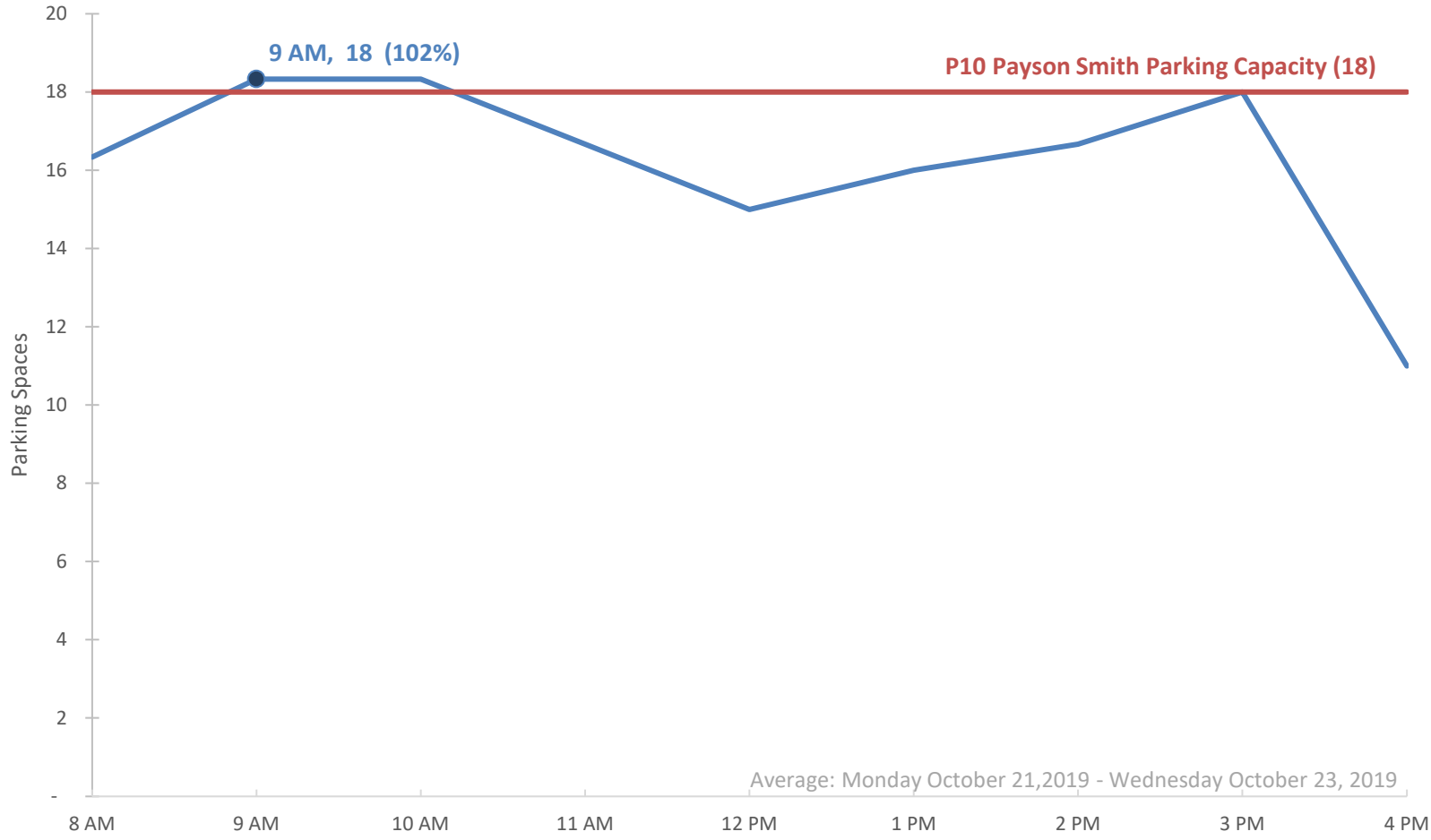
P8 Physical Plant Lot Parking Demand



P9 Sullivan Recreation Lot Parking Demand

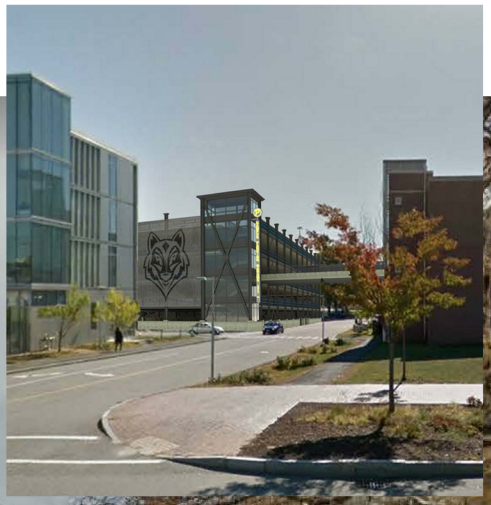


P10 Payson Smith Parking Demand



Parking Feasibility Study

University of Southern Maine
68 Falmouth Street & 88 Bedford/Surrenden Streets
Portland, ME





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Executive Summary

Introduction

Platz Associates was contracted by the University of Southern Maine to conduct a site evaluation and Parking Feasibility Study in support of the growing parking demands at the Portland campus. The scope of this feasibility study is to understand the impact and cost implications for constructing a single or multi-level parking structure with possible vertical and/or lateral expansions at the selected sites located at 68 Falmouth Street and 88 Bedford / Surrenden Streets, Portland, Maine.

The following items are included in the study:

1. Review of the Owner's Development Objectives (communicated via 2019 USM Master Plan).
2. Identify constraints and opportunities for the selected site(s) and adjacent parcels.
3. Site evaluation, including but not limited to: onsite observations, assessing physical characteristics of the site(s), assessing codes, ordinances, and regulations, assessing available utilities, assessing access, circulation, and parking potential.
4. Identify environmental impact requirements/opportunities for site(s).
5. Conceptual Designs for level-deck and ramped multi-deck parking structures, including expansion schemes.
6. Estimate of Project Timeline and Cost of Work for each site.

Background

The site at 68 Falmouth Street is 2 acres +/- and was identified as a future development site per the 2019 USM Facilities Master Plan (see attached Exhibit A). The site at 88 Bedford/ Surrenden Streets is approximately 1.5 acres +/- and was identified as a future parking structure expansion site due to the adjacency to the existing parking garage. Both sites currently function as surface parking lots with fairly level topography across the site(s) and existing stormwater drainage and site lighting utilities. The Facilities Master Plan involves the infill development of surface parking and open spaces, affecting parking by both the displacement of current parking and by creating additional parking demand with new buildings and increased population. The Facilities Master Plan accounts for 1,000 parking spaces, 400 displaced and 600 new spaces. In 2017 the USM Portland campus had a headcount of 5,277 students, most all of whom are commuters.

Development Objectives

The most important considerations of the project are to adhere to the President's Goals and the CMPSC Guiding Principles set forth in the USM Facilities Master Plan and the consideration of the upcoming facilities being considered by the University for the adjacent parcels. While fluid in nature, this forecasting of future construction sequencing could provide for opportunities in efficiency and increase the quality of design while lowering the financial investment or impacts to construction schedules.

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CMPSC Guiding Principles (via 2019 USM Facilities Master Plan):

- *Student Experience*- improving the student's academic, co-curricular and living experience.
- *Inclusiveness*- fostering the ability for all to feel safe and participating members of the USM community.
- *Net-Zero Building Policy*- prioritizes capital renewal of existing facilities.
- *Public Safety*- provide the safest campus environment.
- *Mobility*- supporting robust pedestrian, bicycle, shuttle bus, ride share and metro regional public transit systems.
- *Sustainability*- supporting sustainability policies of the University.
- *Neighbors*- establish campus community that are positive members of the neighborhood.
- *Aesthetics*- create an environment that meets the visual quality that meets the mission and goals of the University.

The Portland Plan of the 2019 Facilities Master Plan envisions a transformational future for the campus, with a flexible and dynamic framework. A new campus heart lined by buildings and including significant landscape improvements would seek to capitalize on long views and gateway entry locations.

Process Methodology

First, an understanding of the project goals was established with an initial project kick-off meeting that included designated members from USM. With this consideration of the goals and vision for the project, our design team then visited the selected site(s) and performed a thorough existing conditions review of the available historic data maps, City archive information, available surveys, and visual observations.

For this feasibility study, our first task was to provide a preliminary assessment of the Owner's Development Objectives and identify constraints and opportunities for each site that will impact them. Next, we conducted site evaluations for the parcels that included: (1) on-site observations; (2) assessing the physical characteristics of the site; (3) assessing codes, ordinances and regulations that impact the Owner's Development Objectives; (4) assessing utilities available to the site; and (5) assessing the access, circulation, and parking potentials. Task 3 was identifying the environmental requirements that may apply to the Owner's Development Objectives for the site, such as the need for environmental impact statements, assessments, documentation, testing, or monitoring. A site context description provided for each location that identifies the physical characteristics of the areas immediately surrounding the sites, including land use patterns and potential expansion concepts and assess the impact of the Owner's Development Objectives on the surrounding sites and community. Our analysis also includes concept designs for each parking feasibility study drawn to City of Portland Zoning Code requirements, design budgets, and proposed project timelines for the selected concept designs. After preparing a draft report of the initial findings, meetings were conducted with designated members from USM to review the findings and offer insights and feedback for the preparation of this final report.

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Relevant Design Considerations: Parking Feasibility Study for 68 Falmouth Street

After evaluating the identified site, the following options were developed for consideration by the University. Option 1 includes surface level parking with a level deck above and no circulation between the two levels. Option 2 includes surface level parking, two intermediate level decks, and a top level deck, with circulation between the levels. Option 3 includes surface level parking with a level deck above, and lateral expansion into the community garden site, with circulation. Option 4 includes surface level parking and vertical expansion with multiple level decks above in a design that is convertible into future classroom or flexible assembly-type galleries or lecture halls situated along Falmouth Street.

All of the proposed options provide highly efficient parking layouts at approximately 300 square feet per space, indicating the dimensional parameters of the proposed site strongly support parking structure development. Additionally, all options offer multiple direct vehicular and pedestrian access points from existing curb cuts and sidewalk systems at all corners of the site, and integrate well with the existing topography which will minimize costs and site disruption. None of the layouts would require any special City of Portland Planning Board relief or zoning variances.

Chief considerations in selecting the preferred option, or sequential combination of options, include; number of parking spaces desired by phase(s), impact to future building development, and parking displacement for future expansion(s). After review with University Staff, Option 4 was selected for additional massing development to test the conversion aesthetics from the perspective of both the residential neighborhood and the classroom spaces in the adjacent Science Building.

The design parameters for Option 4 include:

- *Initial 4-Level parking garage consisting of 80-space ground level with entrances to North and South, two mid-levels of 114 spaces, and a top level of 117 spaces for a total of 425 spaces.*
- *Level-bay construction along Falmouth Street for possible conversion of parking decks into Office/Classroom space, softening the aesthetic offered to the residential neighborhood.*
- *38 parking spaces may be converted to 11,000 sf gross (8,350 sf net) Office/Classroom spaces, which is possible on a per-floor basis.*
- *Vehicular and pedestrian connections are possible in all directions, including the existing sidewalk system and driveways/lots at Falmouth, Bedford, and Durham Streets.*

For the development of the massing and façade studies, three levels of parking was converted resulting in 33,000 sf gross (25,050 sf net) office/classroom space and an adjacent 323 space parking field. This design maximizes the grade-level sidewalk connections and biases the façade development to the pedestrian realm, leaving the top deck of parking to reduce the building's massing along Falmouth Street and the impacts to the views from within the Science Building.

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Relevant Design Considerations: Parking Feasibility Study for 88 Bedford/ Surrenden Streets

After evaluating the identified site, the following options were developed for consideration by the University. Option 1 includes an arcing garage form that responds to the lot line along I-295 with internal circulation ramp connecting all levels of parking and providing site relief and view corridors towards the proposed future graduate center location adjacent to the Library/Osher Map buildings. Option 2 includes a rectangular multi-level garage with internal circulation ramp connecting all levels of parking and skybridge connection to the existing garage at the second level. Option 3 includes a level-deck expansion scenario to the existing garage with independent access to each level and radial internal circulation ramp providing site relief and view corridors towards the proposed future graduate center location adjacent to the Library/Osher Map buildings.

All of the proposed options provide highly efficient parking layouts at approximately 315 square feet per space, indicating the dimensional parameters of the proposed site strongly support parking structure development. Additionally, all options offer multiple direct vehicular and pedestrian access points from existing curb cuts and sidewalk systems at all corners of the site, and integrate well with the existing topography which will minimize costs and site disruption. None of the layouts would require any special City of Portland Planning Board relief or zoning variances.

Chief considerations in selecting the preferred option, or sequential combination of options, include; number of parking spaces desired, site and viewshed impacts to the future graduate center site, and financial impact(s) from modifying the existing garage structure. After review with University Staff, Option 1 was selected for additional massing development to test the conversion aesthetics from the perspective of both the I-295 highway corridor and the access drive adjacent to the Wishcamper Center.

The design parameters for Option 1 include:

- *5-Level parking garage consisting of 110-space ground level with entrances to North and West, three mid-levels of 161 spaces, and a top level of 173 spaces for a total of 766 spaces.*
- *Sculptural arcing form referencing the I-295 corridor and the adjacent cloverleaf highway on/off ramps provides a large marketing opportunity for integration into the façade elements.*
- Relief provided at the future graduate center building site, allowing for exposure and views between the campus and downtown.
- *Vehicular and pedestrian connections are possible in all directions to the existing sidewalk system and Bedford Street.*

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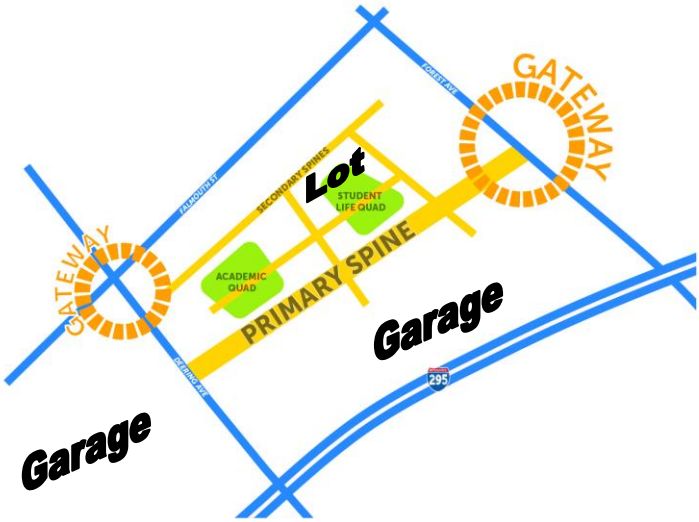
Part 1 : Parking Feasibility Study of 68 Falmouth Street Lot

Preliminary Assessment of Owner's Development Objectives

The 2019 Facilities Master Plan seeks to establish a new residential quad in place of the existing surface parking lot to connect to and pair with the adjacent academic quad. Liner buildings would reinforce the quad enclosure and the parking structures provided for students, faculty and visitors would be concentrated at the perimeter of the campus.



A concern with this approach is it does not provide a convenient parking adjacency to the buildings being served by the parking fields, the prime factor in the utility of a parking structure. Winter weather and the wide Right-of-way width of the Bedford Street arterial drive serving as the campus gateway combine with a long travel distance as significant barriers to the effective utilization of the existing parking garage.

The Design Team suggests incorporating a flexible, expandable, and interconnected parking armature, located within the campus bounds as defined by the perimeter arterial roadways, establishing a new landscaped residential quad for the campus that preserves open space and long views to Downtown Portland while simultaneously providing a highly effective, safe and available parking solution.

Integration of the parking structures directly with the building(s) they serve could provide opportunities to merge "back-of-house" activities for increased efficiency and utility while preserving development flexibility for the site. The visibility and way-finding provided for the parking structures from the arterial connections should be considered carefully in the campus master planning to ensure the highest levels of convenience and utility.

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Site Evaluation

Utilities

All utilities including but not limited to electric, water, sewer, storm drainage and gas service appear available to the site directly from Falmouth Street, pending confirmation of available capacity by each utility. Of these major utilities serving adjacent buildings/lots, only a storm drainage line and a sewer line appear to cross the site and may need adjustment in coordination with the parking structure development. Additionally, a See Appendix D for additional information.

Topography

The site topography varies throughout the campus, but is generally descending in grade from West to East. The site's existing surface parking lot and related site improvements provide the opportunity to connect at-grade on the East edge and adjacent grades slope up approximately 10 feet to the West edge, an advantage for parking structure development that allows the potential for direct connection to upper levels, reducing the impact of internal and external circulation and "couching" the lower level of parking to reduce visual impact from the campus core. See Appendix E for additional information.

Parking

The site is currently used as a surface parking lot consisting of 62 total parking spaces, 4 of which are dedicated to handicap accessibility. The parking lot is for USM faculty and staff and denoted as Lot P9. The only point of vehicle access is from the North corner of the parking lot from Falmouth Street.

Pedestrian Access

There is a path that borders the South East portion of the parking lot which connects to the Sullivan Recreation and Fitness Complex, the Science Building, and other campus pathways. The pathway is accessible from a set of stairs located in the South corner of the parking lot or the open area located in front of the Sullivan Recreation and Fitness Complex. All parking options provide direct connectivity to the pedestrian circulation system, requiring varied levels of off-site disturbance depending on desired access points. See Appendix B for additional information.

Building Height

The proposed height of the parking structures in all of the options vary, however; each option is below the allowable height of 75' per the zoning ordinance. For the purpose of this feasibility study, the Design Team has developed layouts that are limited in height to 38 feet to correspond with and support the view opportunities from the upper levels of the adjacent Science Building. See Appendix C for additional information.

Building Setbacks

All proposed parking structures are within the setbacks set forth in the zoning ordinance. The only setback that is applicable to this study is the setback along Falmouth Street, which is 20'. See Appendix C for additional information.

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Pedestrian Access

Pedestrian access and connectivity is maintained largely "as-is" in each of the parking options. The nature of efficient parking garage design supports pedestrian circulation nodes at the corners where vehicular parking is unavailable. Each parking option anticipates vertical circulation stair towers at these corners, and aligns these pedestrian elements with the existing sidewalk system and away from vehicular drives to provide a high degree of visibility, comfort, and safety.

Vehicle Access

All parking options would maintain the current access point on Falmouth Street, while some would potentially add access points from the central campus parking lot access drive or from Durham Street through the existing Central Heat Station parking lot. These options may not be favorable for long-term implementation, but may be designed to be convertible into pedestrian-focused elements if alternate vehicular access points are provided in a parking garage expansion.

Delivery/Loading Access

The existing loading dock at the surface lot to the Science Building is to be maintained, and importantly, will be expanded with a dedicated entry to reduce traffic backup conditions and to provide additional capacity for future needs. Additional service vehicle or university maintenance parking could be incorporated within this loading zone.



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Identification of Environmental Requirements

Due to the highly variable disposition of silty and sandy soils across the Back Bay basin generally, and extending specifically to the surrounding sites at the existing parking structure at Surrenden Street, it is recommended that a geotechnical engineer be brought on-board early in the schematic design process to provide soil analysis and identify the soil improvements necessary to support the preliminary foundation design.

Beyond this soils composition assessment, there are no known needs for environmental impact statements, additional environmental assessments, or testing/monitoring with respect to the materials reviewed as part of this parking feasibility investigation.

Generally, the proposed parking options provide close integration with the existing grades and take advantage of adjacent elevations to reduce the impact of sitework and potential exposure to the import/export of soils. Additionally, the lighter weight of a steel garage structure would support the use of either spread footings or geopiers, granting the Design Team flexibility to tailor a structural solution with the lowest level of environmental impact.



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Site and Neighborhood Context Description

Campus

The University was founded in 1878 with Corthell Hall being the first university building in Gorham, Maine. The Portland campus is located downtown and bordered by highly trafficked roads including, Interstate Highway 295, Forrest Avenue, Deering Avenue, Falmouth Street, and Bedford Street. The campus buildings are a variety of materials including but not limited to brick, glass curtain wall, panelized systems, and concrete.

Neighborhood

A completely developed urban neighborhood. The adjacent land consists of Interstate Highway 295 on the South, commercial uses on the North and residential uses on the west and south. The largest adjacent land use is the Oakhurst Dairy distribution center between the campus and Forest Ave. The adjacent residential areas provide housing for some of USM's students but are generally a set of very solid and cohesive neighborhoods.

Zoning

The campus is located in Zone R5 in the City of Portland, with an overlay zone type of "USM" for the University of Southern Maine. This zone has a strict set of rules designed to create a quality and cohesive campus environment while integrating with and respecting the residential character of surrounding neighborhoods.

USM Campus Design Principles and Standards (*Adopted May 23, 200)*

STANDARD A-1: Campus Edges Parking lots and structures, blank walls, or backs of buildings shall not be sited in a manner that forms a boundary to neighborhoods and the city.

STANDARD A-5: Views and Landmarks. View corridors and terminations to landmarks such as campus buildings, city buildings, and natural resources, shall be highlighted with design elements such as significant architectural features, quality materials, landscaping, public art or other visual amenities. View corridors and termination points shall include the view up Bedford Street and west across Deering Ave., and other important views as may be identified during campus planning and the City's development review process.

STANDARD B-3: Multi-modality. New development shall relate to a campus circulation system that serves pedestrians/bicyclists, autos, public transportation, service vehicles, and emergency vehicles. New development along transit corridors shall provide convenient and accessible routes from the building to the nearest transit stop.

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STANDARD B-4: Traffic-calming. Circulation improvements internal to the campus shall be designed to create a pedestrian-oriented environment and to discourage speed. Appropriate traffic calming measures may include gateway treatments that signal arrival into the campus environment, corner neck-downs, narrowed travel lanes, roundabouts, speed tables, and other devices. Development along public streets shall be designed with traffic calming measures to the extent allowed by City and State policies and requirements at a minimum.

PRINCIPLE C: Parking, Loading and Service Areas. Parking structures shall be designed and located so as to present an attractive façade to neighboring uses in order to minimize the impact along streets and residential areas. Surface parking lots shall be sited and designed to minimize their visual presence on the campus.

STANDARDS C-1: Structures. Parking structures shall be compatible with adjacent uses and architecture in form, bulk, massing, articulation, and materials. Parking structures shall incorporate architectural design elements in order to achieve visual interest on street frontage facades, and along major pedestrian ways, for the full height of the structure, that serve to enhance the pedestrian experience. STANDARD C-2: Active Uses: Parking structures shall incorporate liner buildings or enclosed active uses on the first floor along all primary frontages (excluding frontage dedicated to entrances, lobbies, and stair towers). Such space shall be provided with a minimum of 9-foot floor to ceiling clearance height and a 25-foot depth (measured from the exterior building wall). Alternatively, the parking structures may be set back at least 35 feet from the primary street right of way and that space shall not be occupied by surface parking or access lanes and shall be designated for future development. The setback space shall be provided with all stubbed utilities and other provisions needed to accommodate further development.

STANDARD C-3: Decks and Ramps. Parking structures shall have horizontal decks on all levels where the decks are visible from the public rights of way. Ramps and no horizontal parking decks shall be screened from all visible angles and shall not be permitted 4 on facades located along or within 45 feet of a public street (Note: such space would allow for the construction of a liner building and a ten-foot separation).

STANDARD C-4: Surface Lots. Parking lots shall be located behind buildings or to the side of existing or future buildings, but shall not occupy more than 64 feet of public street frontage within 45 feet of the street right of way (to allow for a future building). The areas devoted to surface parking shall be screened from streets, walkways, and significant views through the use of design elements such as plantings, fencing, grade changes, and/or walls.

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Site Implications (from Owner-provided campus utility plans)

Water Items:

- 4" Water pipe adjacent to the Eastern side of the lot – located at the James V. Sullivan Recreation & Fitness Complex
- 6" Water pipe adjacent to the Northern side of the lot – located under Falmouth Street
- Fire Hydrant adjacent to the Northern side of the lot – located on the opposite side of Falmouth Street

Gas Items:

- 2" Gas line adjacent to the Eastern side of the lot – located at the James V. Sullivan Recreation & Fitness Complex
- 6" Gas line adjacent to the Northern side of the site – located under Falmouth Street

Tele/Data Items:

- 2 Conduits located at the Northern part of the lot cross from East to West

Electrical Items:

- Conduit(s) located at the Northern part of the lot cross from East to West

Current Traffic Patterns

Forest Avenue serves as the primary arrival point to the USM Portland campus. The secondary arrival point to the campus is at the intersection of Deering, Brighton, and Falmouth Streets. The third arrival point to the campus is Bedford Street, which bisects the campus providing access to most of the parking supply for the campus.

Future Traffic Pattern Considerations

Closure of the Brighton Avenue Extension and installation of a roundabout at the intersection of Brighton, Deering, and Falmouth streets. After which, the remaining extension of Brighton Avenue will be given to USM by the city of Portland.

Alternate Means of Transportation

As identified in the Facility Master Plan, USM supports robust pedestrian, bicycle, shuttle bus, ride share and metro regional public transit systems that look beyond private vehicular parking to meet the transportation needs of the campus community. This could have a potential impact on the parking requirements for the Portland campus.

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Conceptual Drawings

Design Considerations

The practical parking capacity is an important design consideration due to the fact that no garage can operate at 100% efficiency. The industry accepted efficiency is between 85-95%. This allows for variations in parking activity, loss of parking due to mis-parked vehicles, construction, snow piling, and other unforeseen factors. This efficiency rate also takes into account traffic flow problems related to parkers trying searching for available spaces when the garage is at or near its maximum capacity.

Level of Service

The recommended Level-Of-Service (LOS) for visitor parking is LOS "A" or "B" which provides greater dimensions and ease of use for the parking garage, but for regular monthly parkers an LOS of "C" could be utilized to maximize the number of parking spaces and thereby increasing the efficiency of the design and providing a higher return on investment. LOS "D" is an extremely compact garage design that is mostly reserved for underground parking structures or extremely high-density urban designs.

LOS "B" provides a parking stall that is 8'-9" in width and 17'-9" in length, but this study utilizes a 9'-0" wide and 18'-0" long standard stall, and up to 20% compact spacing per City of Portland Design Standards at 8'-0" wide and 15'-0" long. The drive aisles will be sized at 24' in overall width.

Project Overview

Capacity, expansion, aesthetics and size of the parking structure were taken into consideration for four options developed as part of the programming effort so the design features of each could be evaluated. It is also the understanding that a large structure could have an undesirable impact on the site by restricting view corridors and clashing with the architectural character of the surrounding buildings, with the goal to maintain views from the upper levels of the Science Building towards the city skyline. All of the concept designs therefore top-off at 38'-0" above the existing surface lot to allow for these views from the Science Building.

The Parking Options include:

1. Single elevated level-deck parking scenario without internal ramping and providing independent access to two parking levels
2. Ramped multi-level garage with internal circulation ramp connecting all levels of parking.
3. Lateral expansion scenario with independent access to each level (to be combined with Option 2).
4. Level-deck scenario along Falmouth Street convertible to Office/Classroom Space with internal ramped-deck circulation connecting all levels of parking.

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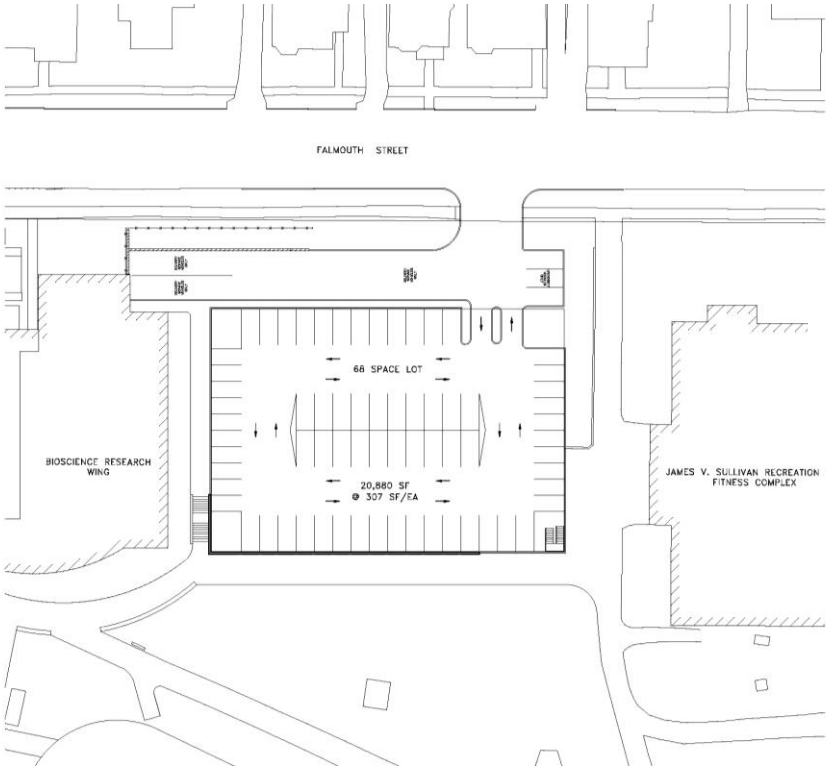
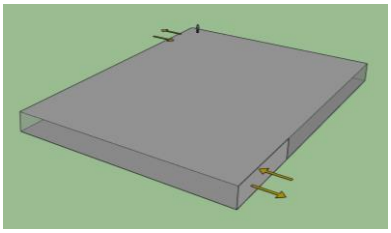
Parking Design Option 1: Single elevated level-deck parking scenario without internal ramping and providing independent access to two parking levels



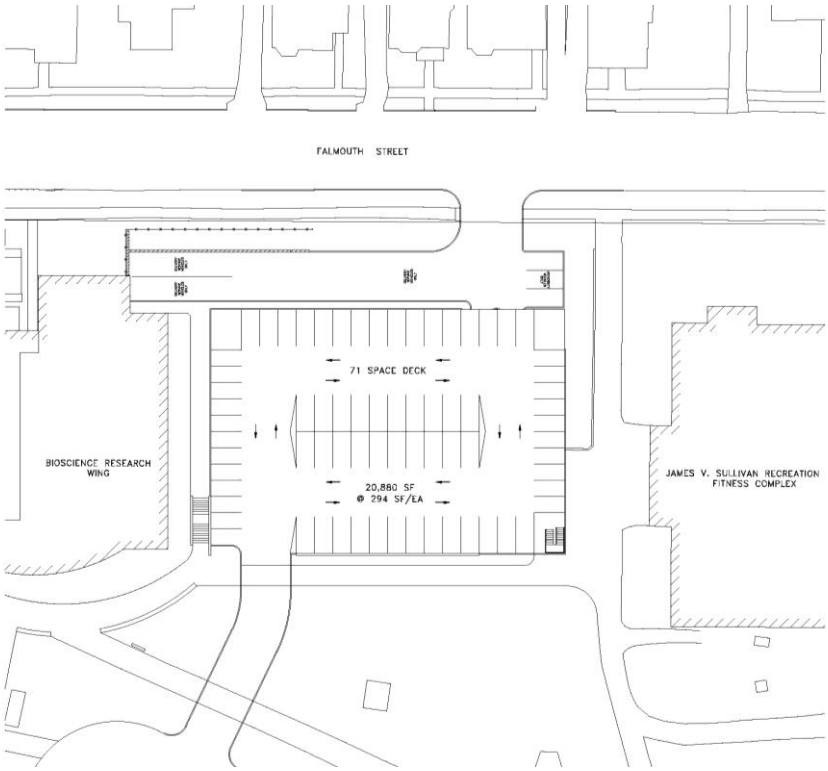


SECOND ~ 20,880 SF @ 294 SF/EA (71 SPACES)

FIRST ~ 20,880 SF @ 307 SF/EA (68 SPACES)

TOTAL ~ 41,760 SF @ 301 SF/EA (139 SPACES)

Level 1



Level 2

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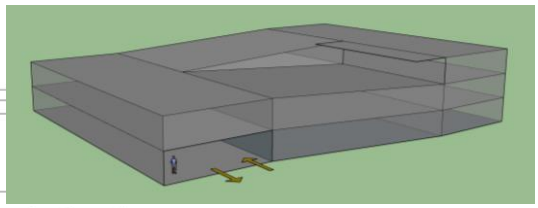
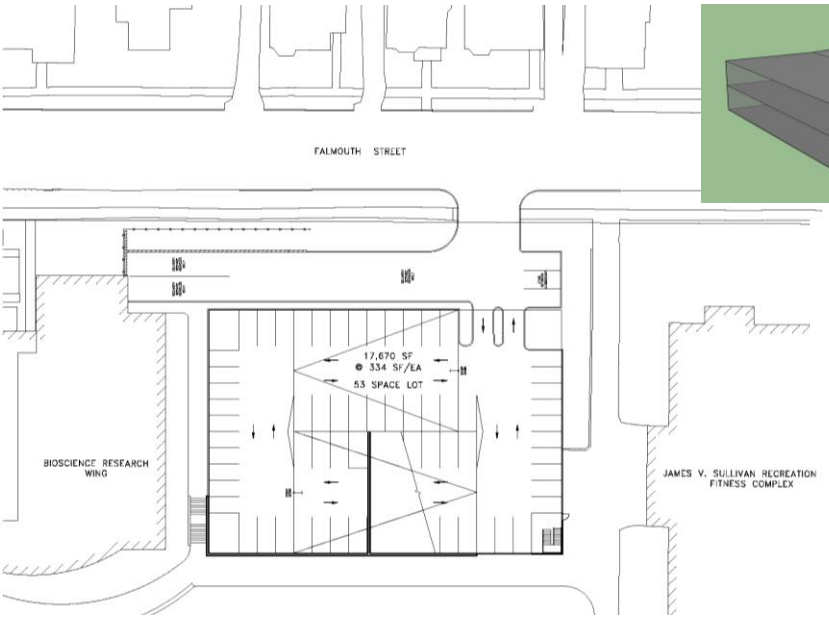
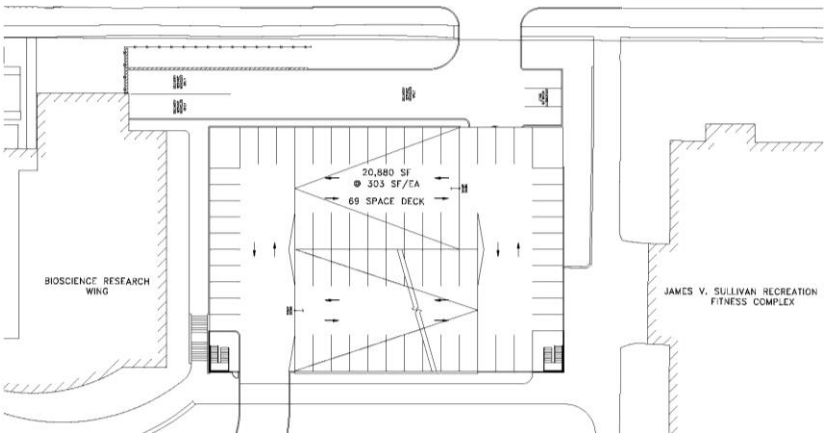
Parking Design Option 2: Ramped multi-level garage with internal circulation ramp connecting all levels of parking





FOURTH ~ 11,520 SF @ 288 SF/EA (40 SPACES)
THIRD ~ 20,880 SF @ 290 SF/EA (72 SPACES)
SECOND ~ 20,880 SF @ 303 SF/EA (69 SPACES)
FIRST ~ 17,670 SF @ 334 SF/EA (53 SPACES)
TOTAL ~ 70,950 SF @ 300 SF/EA (304 SPACES)

Level 1



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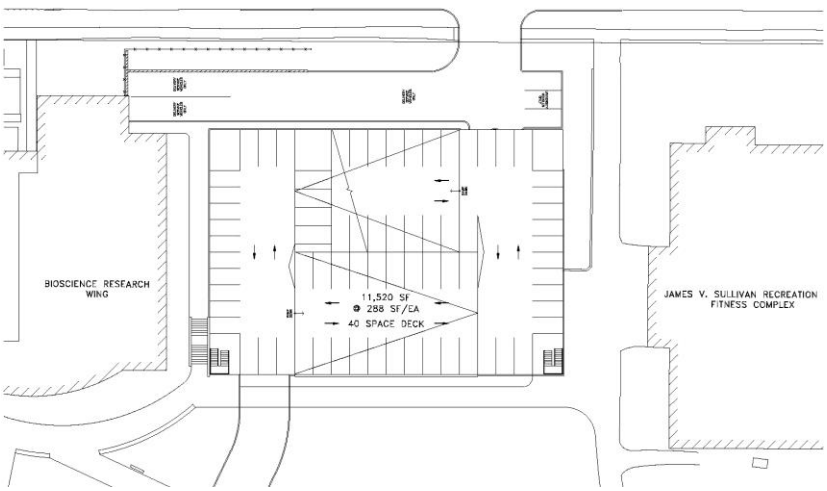

Level 3

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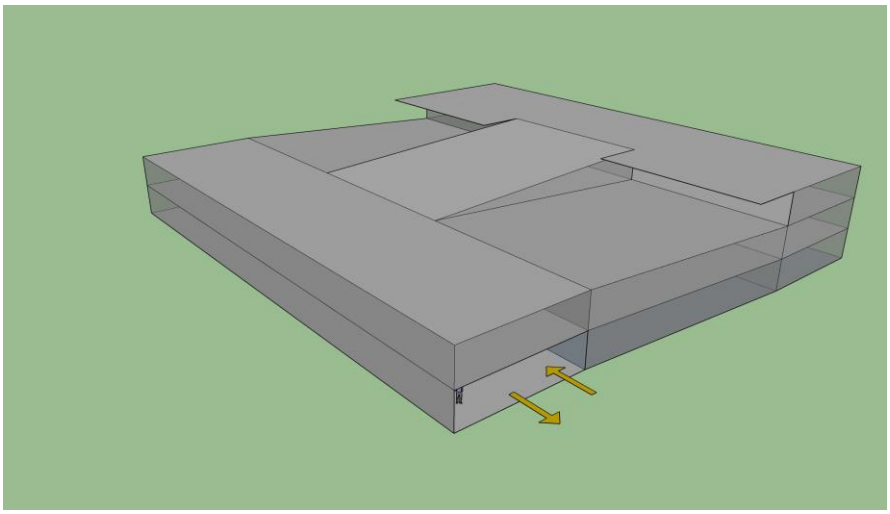
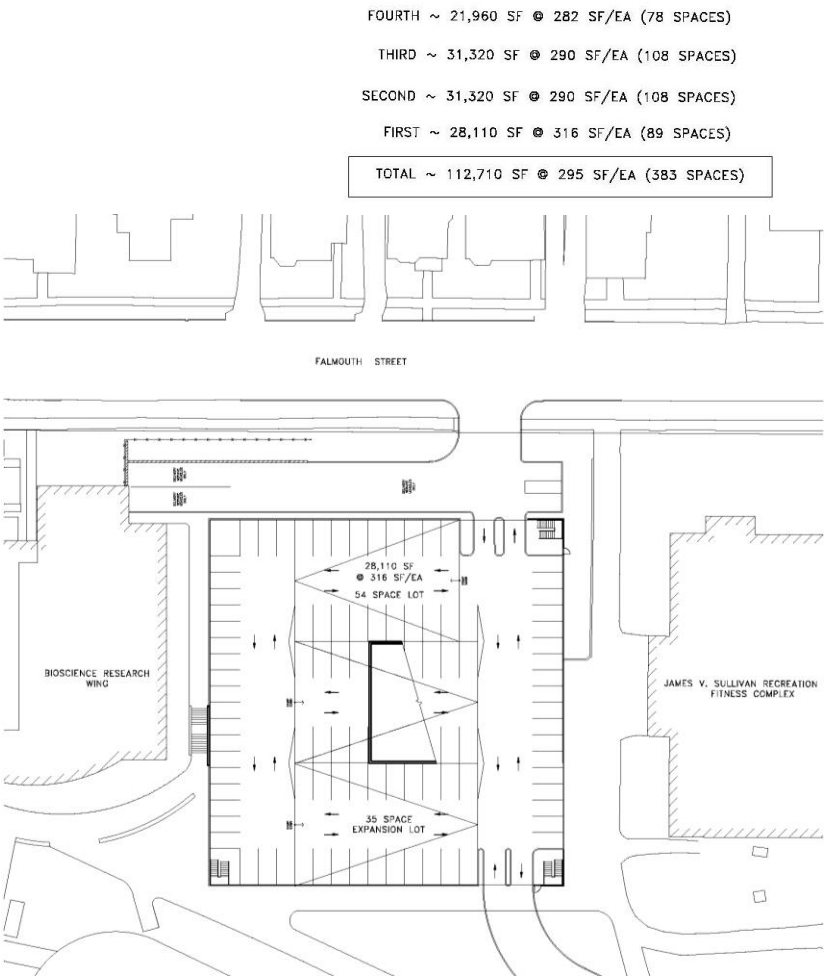
Parking Design Option 3: Level-deck expansion scenario with independent access to each level (to be combined with Option 2)





Level 1

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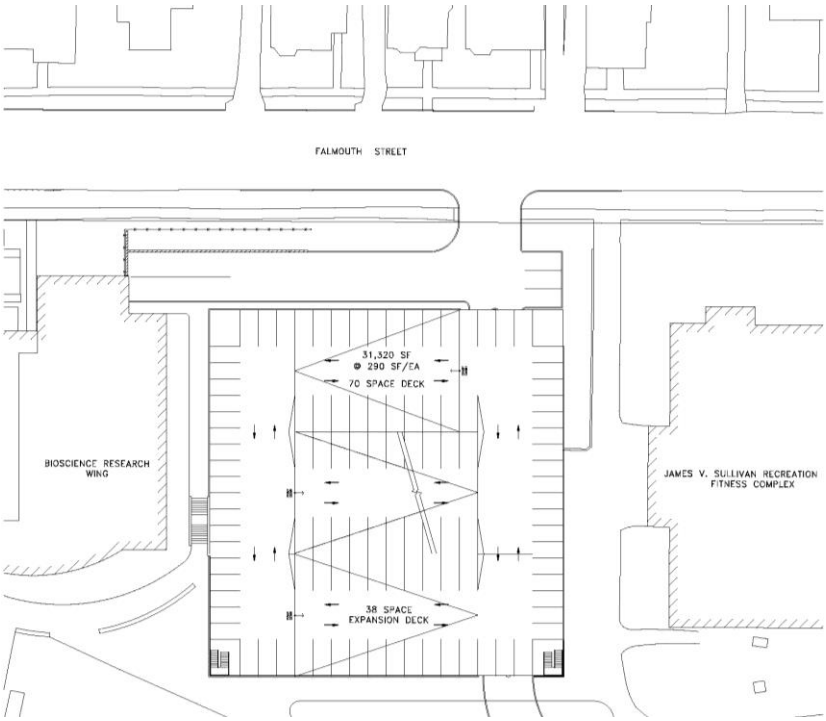
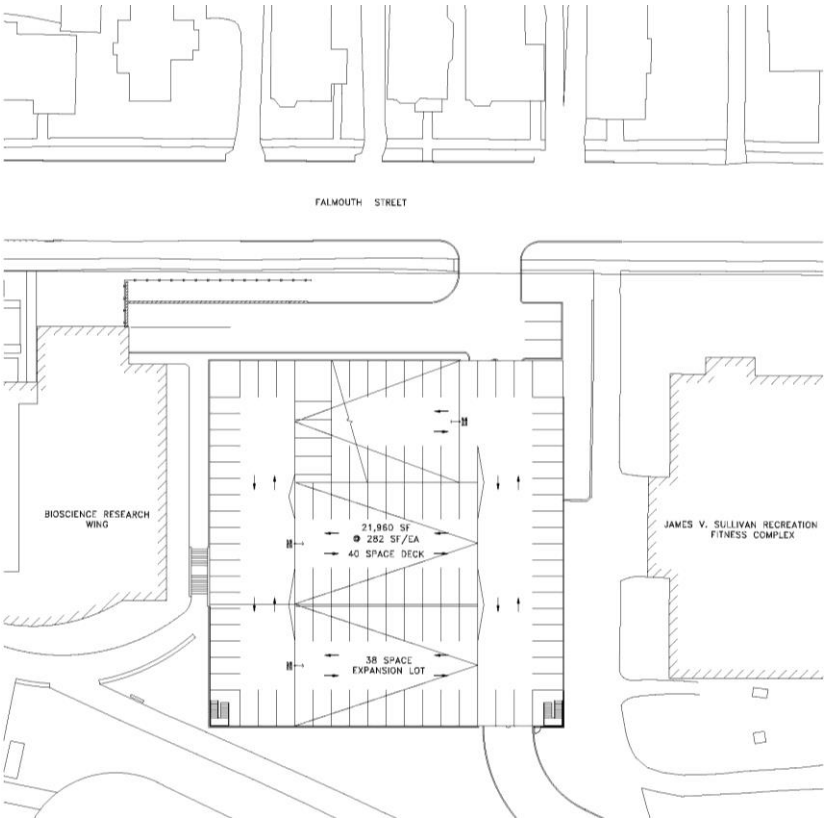


Level 2



Level 3

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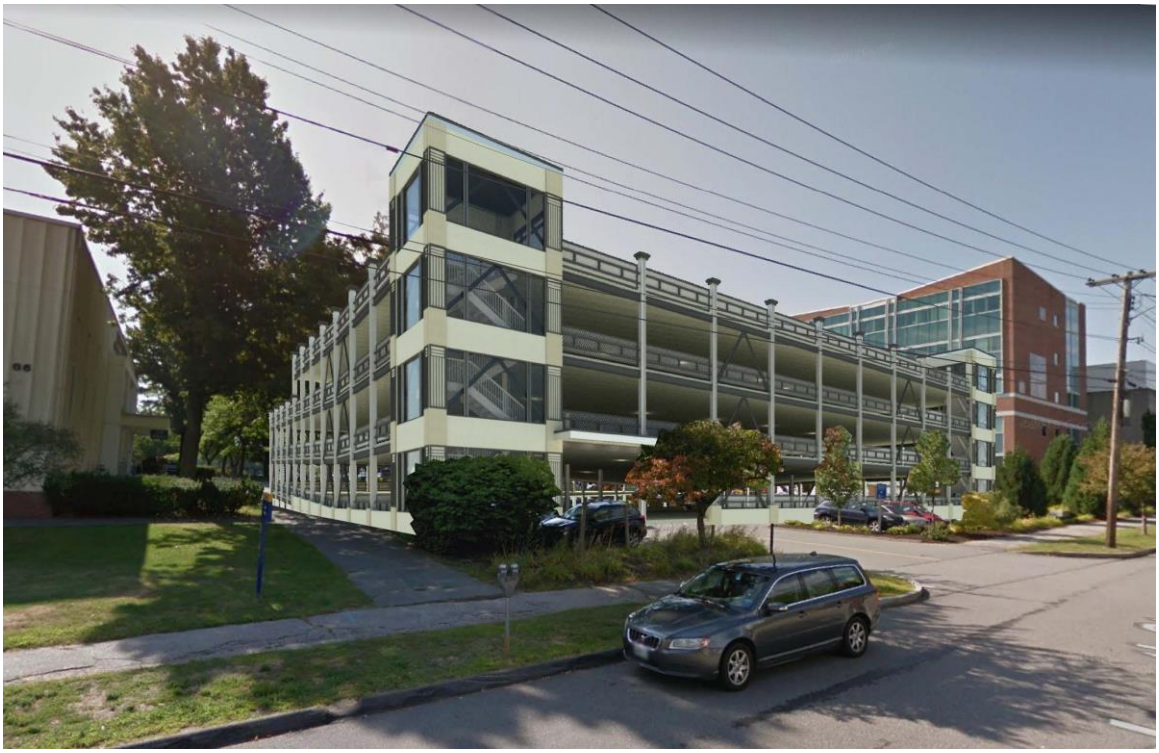
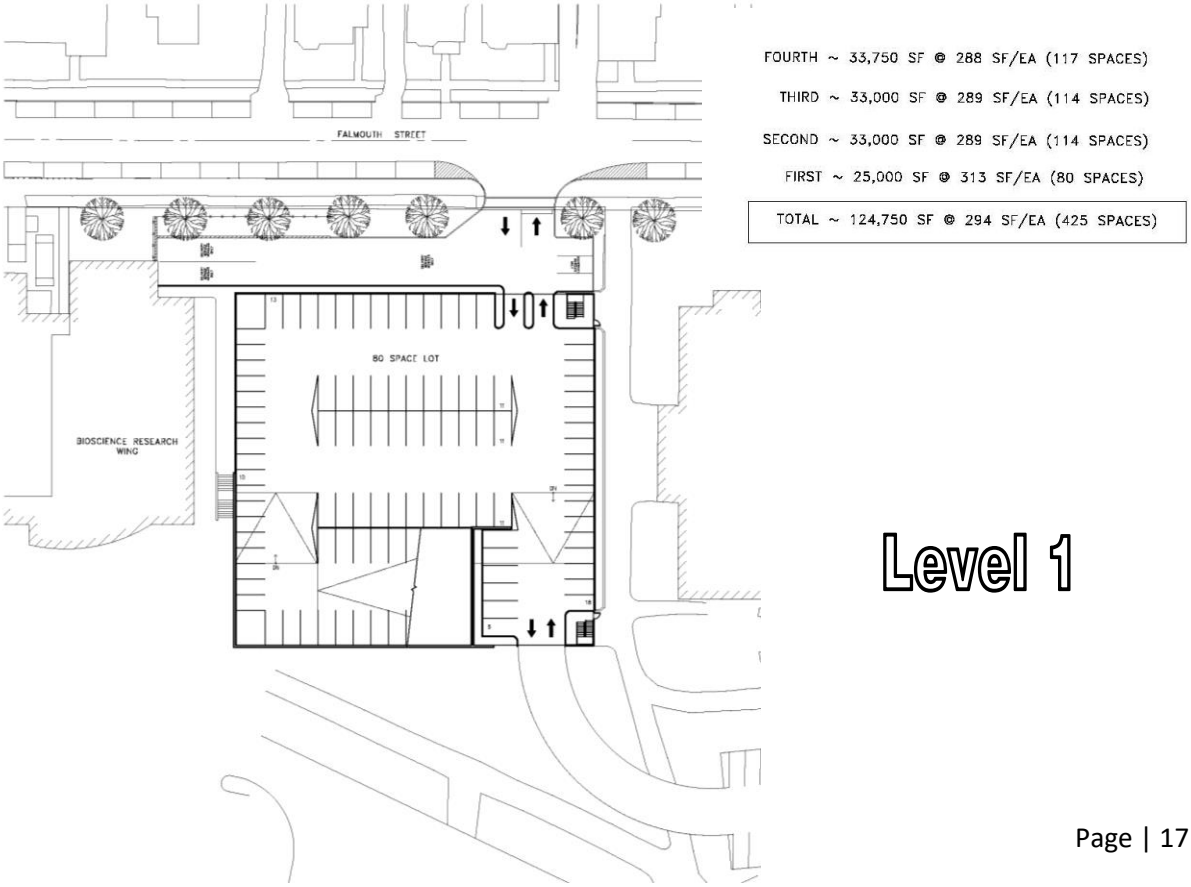
Parking Design Option 4A: Level-deck scenario along Falmouth Street convertible to Office/Classroom Space with internal ramped-deck circulation connecting all levels of parking.





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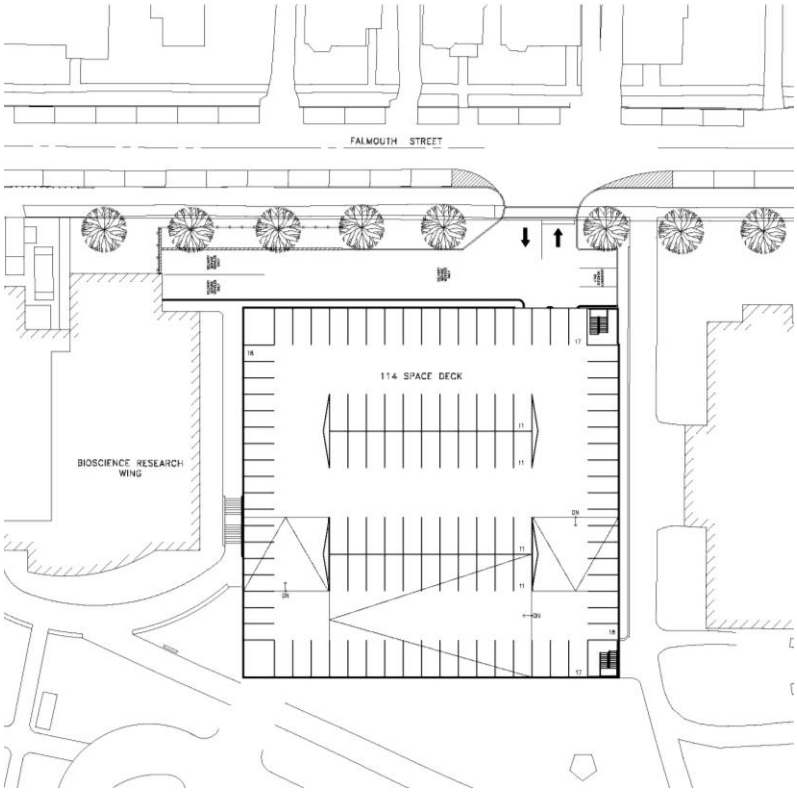
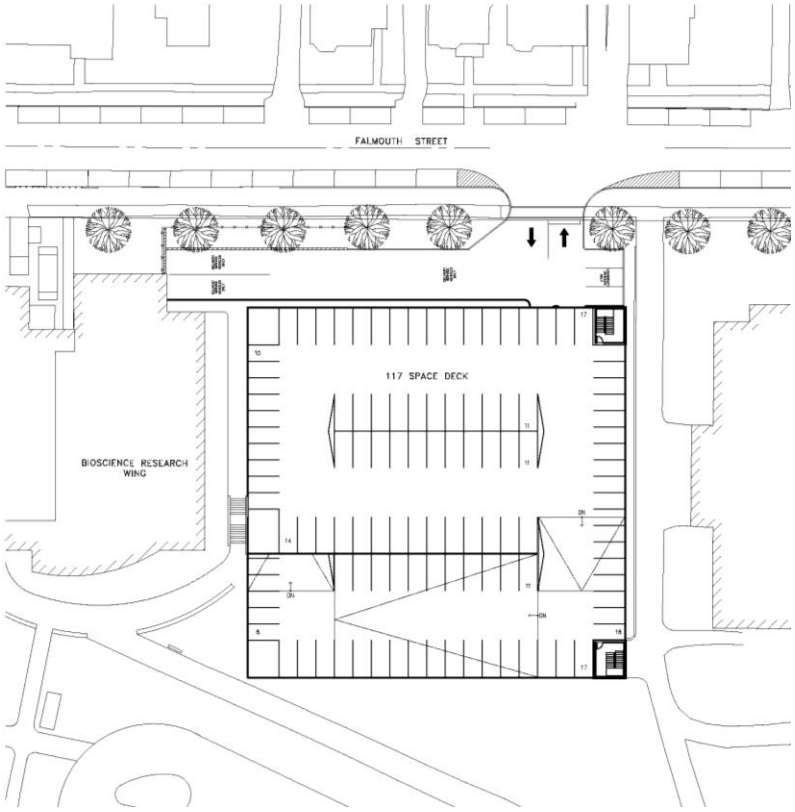


Level 2 & 3



Level 4

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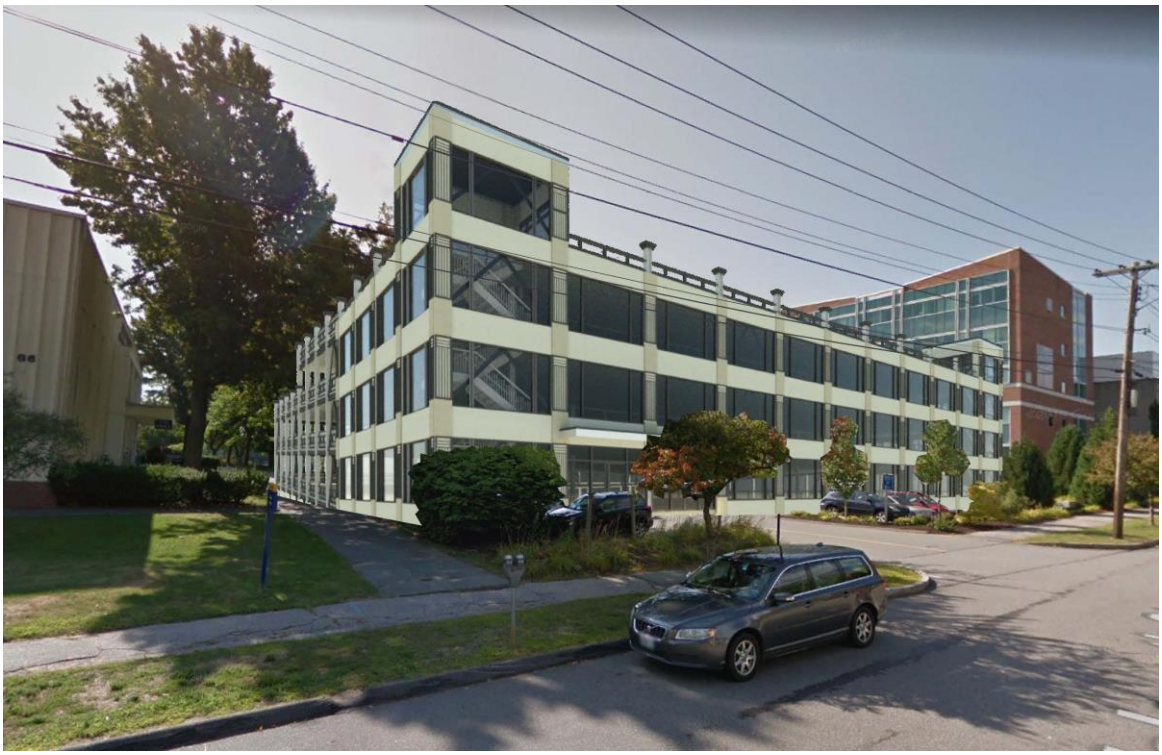
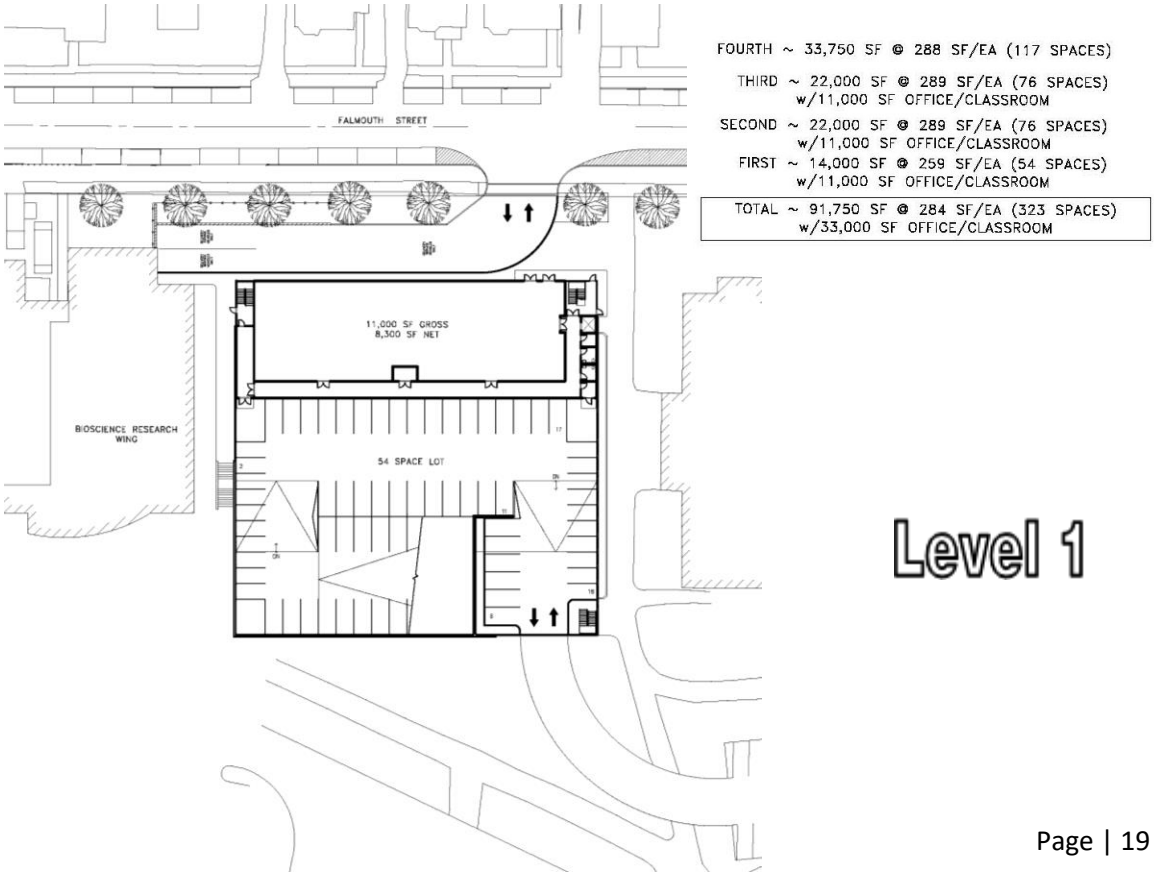
Parking Design Option 4B: Conversion to Office/Classroom Space (33,000 SF gross) with internal ramped-deck circulation connecting all levels of parking behind and above.





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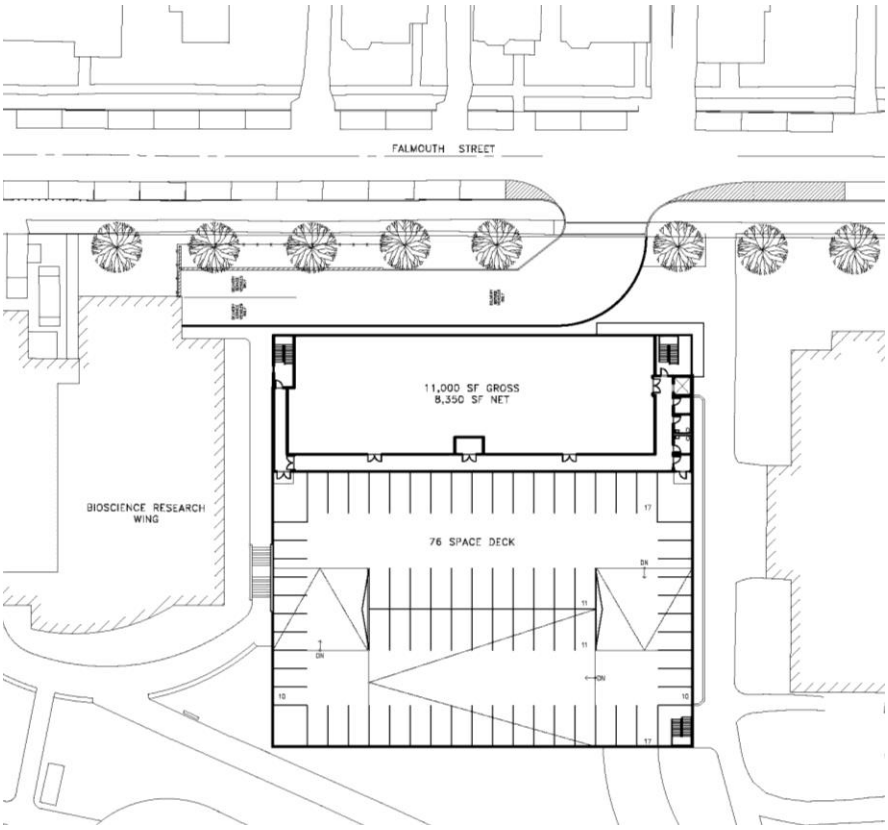

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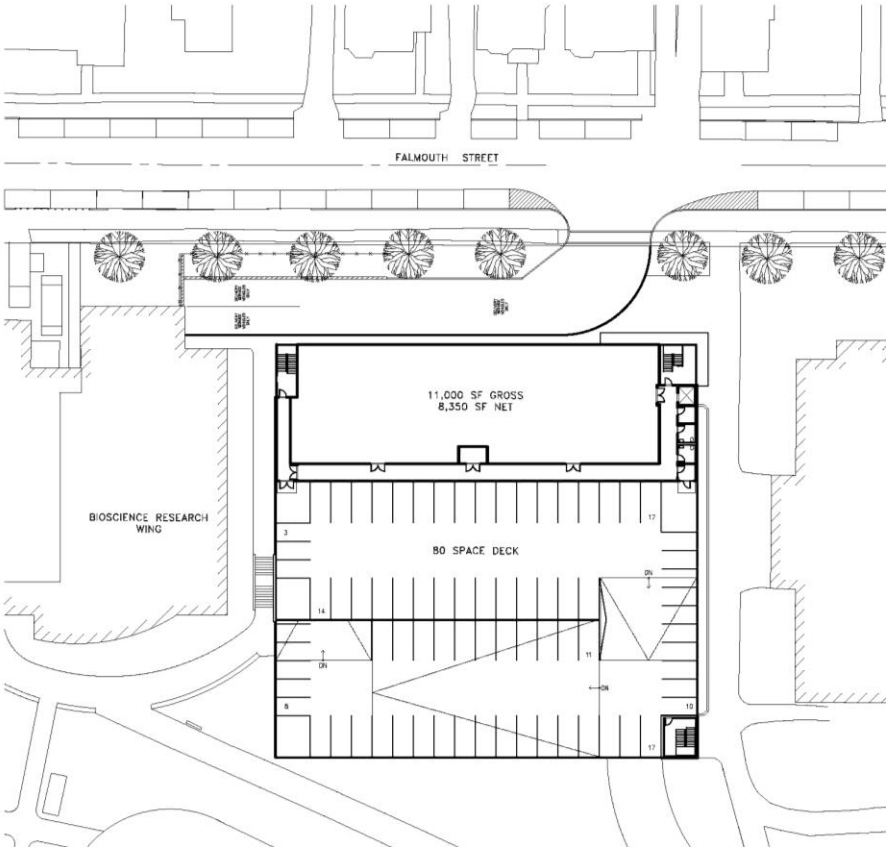

Level 3

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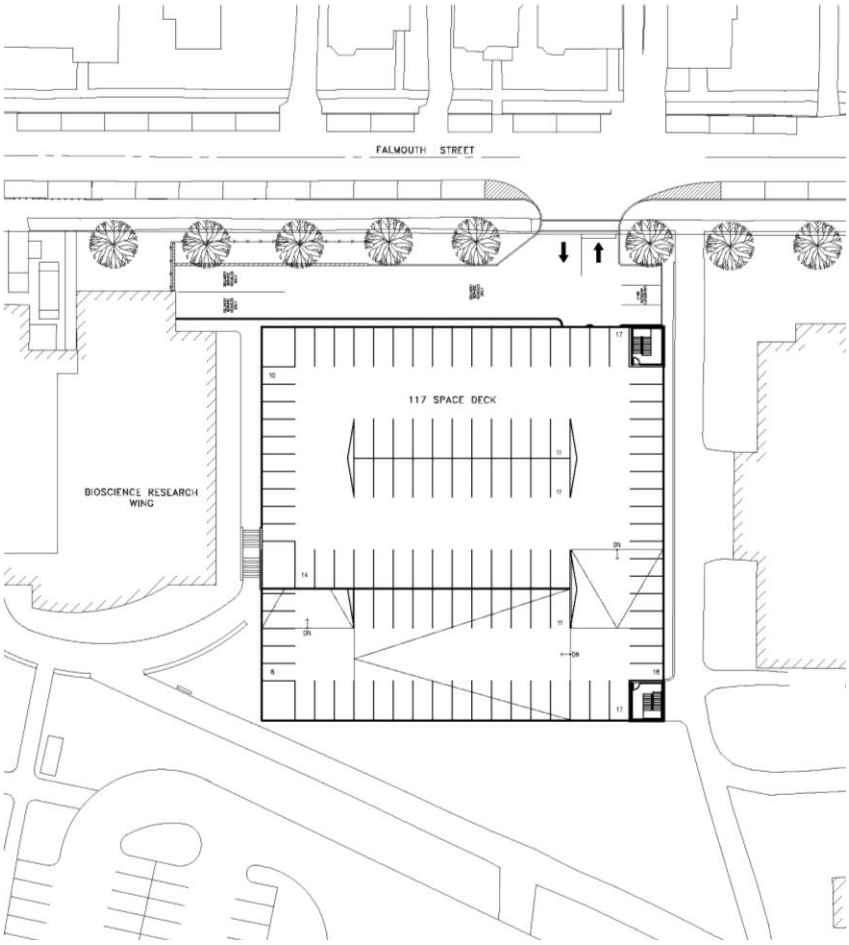

Level 4



Proposed view from Science Building

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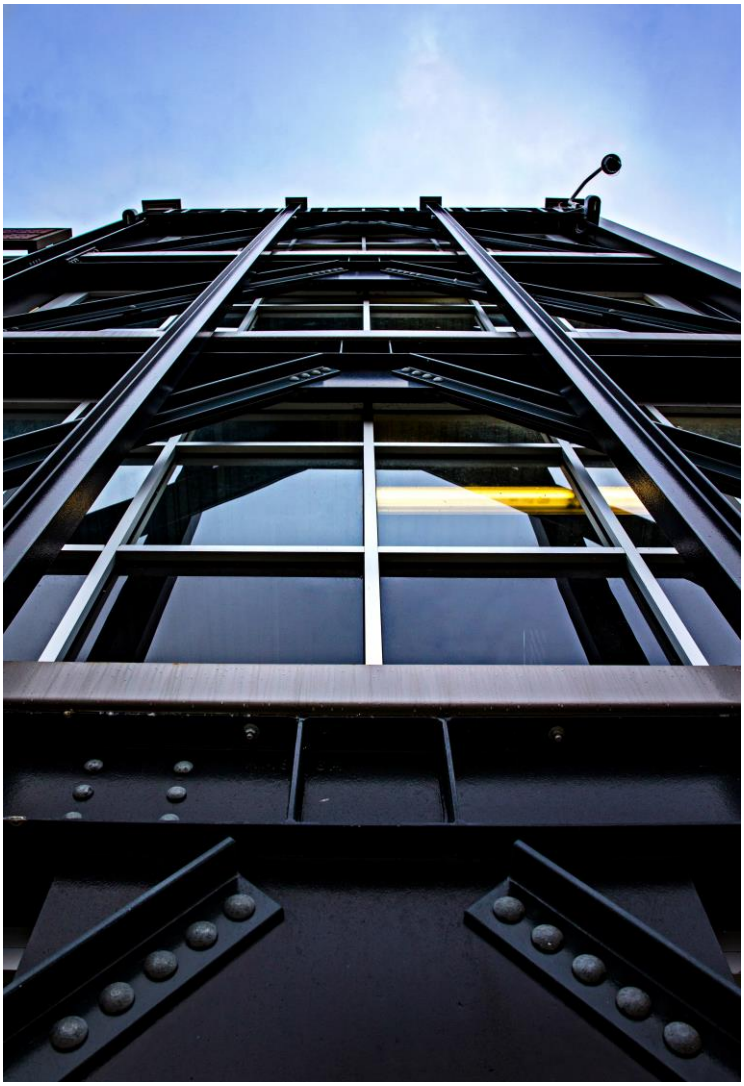
Structural System

The study assumes that a steel structure is used due to cost and the accelerated construction time versus cast in place concrete or pre-cast concrete structures. A footing design of spread footings or rammed aggregate piers is assumed, with cast-in-place composite decks protected with a vehicular traffic coating.

Perhaps most important to the long-term success of the garage design is the patron's feelings of comfort, safety and security while using the facility. Structural steel offers a much thinner structural profile, with small columns, long spans and braced frames rather than massive shear walls, giving the interior of the garage a bright openness with few obstructions for a sense of safety and visual security. Steel framed parking structures can also accommodate any type of façade system, and the building's aesthetics are custom designed to meet the specific requirements of the site or the character of the district surroundings, versus selecting a design from a concrete manufacturer's limited catalogue of standard finishes.



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Design Budget and Proposed Project Timelines

Costs of Steel Structural System

Based on our experience in parking garage design for a number of clients in Maine, we feel that a steel parking structure offers many advantages over a concrete structure and will be a better long-term investment from not only the initial cost and long term maintenance operations perspectives, but also providing more design flexibility and a much more aesthetically-pleasing contributor to the district's architectural fabric.

Initial investment costs are lower for steel-framed parking garages than concrete framing systems, typically quoted 10-15% less, which is partially due to the lighter structural weight and reduced site impacts. Also, the local labor force is far more comfortable with installing a more traditional steel-framed structure versus a concrete structure. The contractors here in Maine will provide a more competitive bid for a steel frame over a concrete system that may force sourcing qualified labor from out-of-state at a higher rate.

The complaint about steel garages in the past is that they have been more expensive to maintain, but we have not found this to be true. Quoted as up to 30% less to maintain than comparative concrete structures by structural engineer examinations, with regular maintenance of the high-performance paint system and elastomeric deck topping, we have found that maintenance costs are very manageable and typically only require spot-patching and paint touch-up, versus the much more extensive deck joint replacements required at regular periodic intervals with precast garages.

Additionally, with the pressures that maintenance budgets endure over the lifespan of a building, the exposed nature of steel-framed design allows for direct visual examination and inspection to assist developing deferred-action maintenance programs to head-off serious issues even during lean times. When concrete structural systems begin to show failure, it is often well past the point of patch and repair, instead requiring the complete and immediate replacement of the overall system which will require a large maintenance capital reserve carried for the life of the garage

Steel frame structures can be easily customized to conform to the particulars of irregular sites, an important consideration in tight urban contexts looking to capitalize on every inch, and may also be expanded in any direction, often planned ahead with the bolt holes pre-drilled. The ease of construction of both the building and the foundation systems capitalize on the efficiencies of shop fabrication, shortening erection schedules and allowing for winter construction. Steel-framed garages typically weigh 20% less than a corresponding concrete structure, which reduces foundation costs and permits a wider range of soil conditions to simplify design.

For all of these reasons, it has been our experience that a steel parking structure would be the most appealing, economical, and flexible garage, offering a maximum return on investment for the University of Southern Maine.

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Design Budget

With the Design-Bid-Build project delivery method, the actual costs of the project are not known with certainty until the bid opening, and are also affected by seasonal availability, the state of the current bid environment, and the complexity of the design as it relates to the available pool of responding contractors. That being said, there are a number of factors that can be used to gauge the pricing performance of the garage design relative to the resultant parking efficiency and the number of special features required for the project.

The current 2019 Means Construction Data pricing guide identifies the average cost of a surface parking space is in the $2,500-$3,000 range, structured parking with elevated decks and an open design in the $18,000-$22,000 range, structured parking with elevated decks in a closed design in the $20,000-$24,000 range, and underground parking with a closed design in the $30,000-$35,000 range. The range of these baseline costs should be considered primarily against the backdrop of the resultant parking efficiency on a square-foot basis, but also the specific project program requirements, such as; vehicular entry, ramping, enclosure, ventilation, and pedestrian access. Due to the highly-efficient nature of the options developed in this parking feasibility study, at approximately 300 sf per space, the average square foot cost of around $45 per square foot for a typical steel-framed parking structure would result in a per-space cost of $13,500.

Proposed Project Timeline

Due to the highly variable impact of the City of Portland design review process, in addition to the review and approval procedure timeline for the University's Capital Improvements process, just to name a couple of possible schedule impacts, the exact project timeline is difficult to determine and some degree of flexibility should be considered when forecasting the project approvals timeline. Also figuring into the early project timeline is the project budget pricing requirements, and the design development gaps afforded to these pricing efforts during design. To accelerate the construction schedule, fast-track techniques, performing parts of the construction effort under winter conditions, and possibly selecting a deck system that does not require a traffic topping may be considered.

The schedule requirements for the major design segments and project approvals would be as follows:

- Preliminary Garage Design and Civil Design Document Preparation……. 2 month duration
- City of Portland Planning Board Approval Process……. 3 month duration
- Design Development and Construction Document Preparation……. 3 month duration
- Project Bid and Contractor Award……. 1.5 month duration
- State Fire Marshal and Local Permit Approvals …….. 2 month duration
- Site and Building Construction ……. 8-10 month duration

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A general timeline for a steel-framed parking garage design and construction that would take best advantage of the traditional construction season with a Spring ground-breaking would be as follows:

- Preliminary Garage Design and Civil Design Document Preparation…….. Nov-Dec 2019
- City of Portland Planning Board Approval Process…….. Nov 2019-Jan 2020
- Design Development and Construction Document Preparation……. Dec 2019-Feb 2020
- Project Bid and Contractor Award……. Feb 2020-March 2020
- State Fire Marshal and Local Permit Approvals ……. March 2020-April 2020
- Structural Steel Shop Drawing Prep and Fabrication…… March 2020-June 2020
- Site and Building Construction …….. April 2020- Dec 2020



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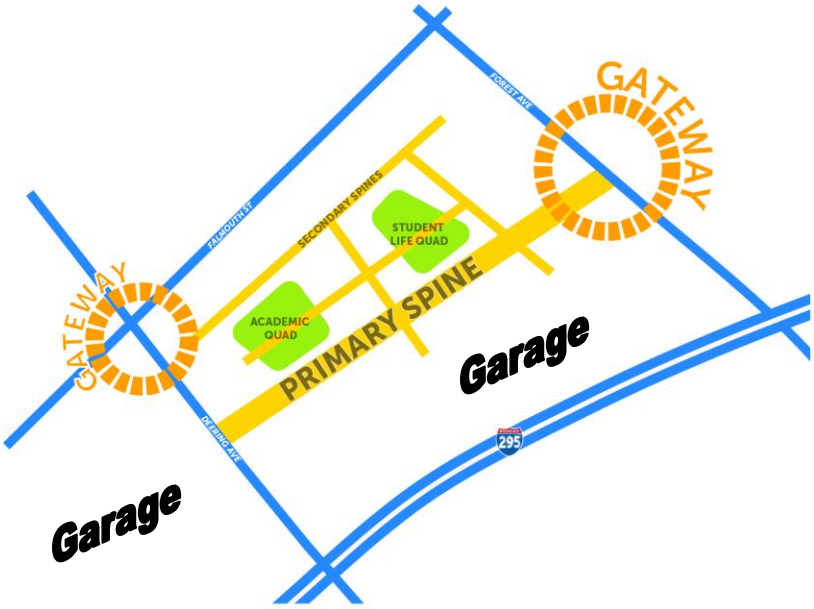
Part 2 : Parking Study of 88 Bedford/Surrenden Street Lot

Preliminary Assessment of Owner's Development Objectives

The 2019 Facilities Master Plan proposes a parking garage expansion in place of the existing surface parking lot to service the adjacent proposed graduate center and existing liner buildings along Bedford Street. The parking structure, provided for students, faculty and visitors, would then be concentrated at the perimeter of the campus with multiple direct connections to several high-population campus buildings.



With the parking structure located behind liner buildings along the arterial drive, the visibility of way-finding signage is critically important to ensure utilization and convenience. Concentrating the parking field adjacent to existing buildings and proposed future developments provides opportunities for either direct connections through pedestrian skybridges or short outdoor transitions through foul weather.

The site has been prepared for a parking structure expansion in this location, with water, sprinkler, and storm drainage lines stubbed to the site at the Northern access drive. Access has also been prepared for both vehicles and pedestrians, with little adjustment required to these site improvements to make way for construction of the new garage building.

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Site Evaluation

Utilities

All utilities including but not limited to electric, water, sewer, storm drainage and gas service appear available either directly to the site or from the local arterial connection to Bedford Street, pending confirmation of available capacity by each utility. Of these major utilities, stubs to the site for future buildings include water for domestic and sprinkler service and storm drainage. They appear to cross the site at a convenient point, but may need adjustment in coordination with the parking structure development. Additionally, a See Appendix D for additional information.

Topography

The site's existing surface parking lot and related site improvements provide the opportunity to connect at-grade on all sides of the proposed parking structure, limited only by the potential internal ramp locations within the garage itself. See Appendix E for additional information.

Parking

The site is currently used as a surface parking lot consisting of 40 total parking spaces, 8 of which are dedicated to handicap accessibility. The parking lot is for USM faculty and staff with some accessible parking serving the adjacent Wishcamper Center, and denoted on the campus map as Lot P3. The only point of vehicle access is from a collector drive at the Northwest corner of the parking lot from Bedford Street.

Pedestrian Access

The Bedford Street arterial drive has a wide pedestrian esplanade that provides opportunities to access the site from the Northwest and Northeast corners. All parking options provide direct connectivity to the pedestrian circulation system, possibly including pedestrian skybridge connections to the adjacent existing parking garage and Wishcamper Center, along possibly with the future graduate center proposed between the Wishcamper and Library/Osher Map Buildings. See Appendix B for additional information.

Building Height

The proposed height of the parking structure in all of the options is 55 feet, however; each option is below the allowable height of 85 feet per the zoning ordinance. For the purpose of this feasibility study, the Design Team has developed layouts that are limited in height to five levels of parking to correspond with the adjacent parking garage and Wishcamper Center building heights. See Appendix C for additional information.

Building Setbacks

All proposed parking structures are within the setbacks set forth in the zoning ordinance. The only setback that is applicable to this study is the setback along the I-295 highway corridor, which is 10'. See Appendix C for additional information.

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Pedestrian Access

Pedestrian access and connectivity is maintained largely "as-is" in each of the parking options. The nature of efficient parking garage design supports pedestrian circulation nodes at the corners where vehicular parking is unavailable. Each parking option anticipates vertical circulation stair towers at these corners, and aligns these pedestrian elements with the existing sidewalk system and away from vehicular drives to provide a high degree of visibility, comfort, and safety.

Vehicle Access

All parking options would maintain the current access point on Bedford Street, aligning the main entrance with the existing adjacent garage for ideal integration with existing parking patterns and equipment. A access drive would be maintained all-around the proposed structure to allow for maintenance and security, loading or staging areas, and/or snow removal.

Delivery/Loading Access

The two existing single-bay loading zones along the perimeter drive around the site are maintained in all options, with the possibility of incorporating additional service vehicle or university maintenance parking within this loading zone.



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Identification of Environmental Requirements

Due to the highly variable disposition of silty and sandy soils across the Back Bay basin generally, and extending specifically to the surrounding sites at the existing parking structure at Surrenden Street, it is recommended that a geotechnical engineer be brought on-board early in the schematic design process to provide soil analysis and identify the soil improvements necessary to support the preliminary foundation design. Generally, the use of a steel-framed structure for the proposed parking garage would reduce the structural pier requirements from those provided for the adjacent precast garage of the same height, providing some assurance that the soils will support the proposed building scenarios.

Beyond this soils composition assessment, there are no known needs for environmental impact statements, additional environmental assessments, or testing/monitoring with respect to the materials reviewed as part of this parking feasibility investigation.

Generally, the proposed parking options provide close integration with the existing level site grades and take advantage of stubbed utilities to reduce the impact of sitework and potential exposure to the import/export of soils. Additionally, the lighter weight of a steel garage structure would support the use of geopiers, granting the Design Team flexibility to tailor a structural solution with the lowest level of environmental and financial impact.



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Site and Neighborhood Context Description

Campus

The University was founded in 1878 with Corthell Hall being the first university building in Gorham, Maine. The Portland campus is located downtown and bordered by highly trafficked roads including, Interstate Highway 295, Forrest Avenue, Deering Avenue, Falmouth Street, and Bedford Street. The campus buildings are a variety of materials including but not limited to brick, glass curtain wall, panelized systems, and concrete.

Neighborhood

A completely developed urban neighborhood, the adjacent land consists of Interstate Highway 295 on the South, University buildings to the North and East, and the existing parking garage to the West. The largest adjacent land use is the parking garage, which is accessed from Surrenden Street. The adjacent university structures are generally a set of very solid and consistant building blocks, within which the proposed garage options would cohesively connect, with circulation view corridors that offer relief to the massing.

Zoning

The campus is located in Zone R5 in the City of Portland, with an overlay zone type of "USM" for the University of Southern Maine. This zone has a strict set of rules designed to create a quality and cohesive campus environment while integrating with and respecting the residential character of surrounding neighborhoods.

Site Implications (from Owner-provided campus utility plans)

Water Items:

- 6" Water pipe stubbed to the North side of the lot – located at Conant Street
- 8" Water pipe for a possible sprinkler system stubbed to the North side of the lot – located at Conant Street
- Fire Hydrant at the Northwest corner of the lot – located on the site side of the access drive

Gas Items:

- 8" Gas line to the North of the site is available for connection down the access drive – located under Bedford Street

Tele/Data Items:

- Two 4" conduits are located at the Northern part of the site cross from the existing parking garage to the Wishcamper Center.

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Electrical Items:

- Conduits are located at all sides of the site, with some lines that might serve a future building needing verification.

Current Traffic Patterns

Forest Avenue serves as the primary arrival point to the USM Portland campus. The secondary arrival point to the campus is at the intersection of Deering, Brighton, and Falmouth Streets. The third arrival point to the campus is Bedford Street, which bisects the campus providing access to most of the parking supply for the campus.

Future Traffic Pattern Considerations

Closure of the Brighton Avenue Extension and installation of a roundabout at the intersection of Brighton, Deering, and Falmouth streets. After which, the remaining extension of Brighton Avenue will be given to USM by the city of Portland. The proposed parking garage would connect to the Bedford Street arterial drive, adjacent to the existing garage exit, which the Design Team suggests could be adjusted to allow incoming traffic in addition to the exit pattern.

Alternate Means of Transportation

As identified in the Facility Master Plan, USM supports robust pedestrian, bicycle, shuttle bus, ride share and metro regional public transit systems that look beyond private vehicular parking to meet the transportation needs of the campus community. This could have a potential impact on the parking requirements for the Portland campus. Areas within and around the proposed parking garage may be outfitted with ride share signage or bicycle racks to encourage and support alternate transportation modes.



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Conceptual Drawings

Design Considerations

The practical parking capacity is an important design consideration due to the fact that no garage can operate at 100% efficiency. The industry accepted efficiency is between 85-95%. This allows for variations in parking activity, loss of parking due to mis-parked vehicles, construction, snow piling, and other unforeseen factors. This efficiency rate also takes into account traffic flow problems related to parkers trying searching for available spaces when the garage is at or near its maximum capacity.

Level of Service

The recommended Level-Of-Service (LOS) for visitor parking is LOS "A" or "B" which provides greater dimensions and ease of use for the parking garage, but for regular monthly parkers an LOS of "C" could be utilized to maximize the number of parking spaces and thereby increasing the efficiency of the design and providing a higher return on investment. LOS "D" is an extremely compact garage design that is mostly reserved for underground parking structures or extremely high-density urban designs.

LOS "B" provides a parking stall that is 8'-9" in width and 17'-9" in length, but this study utilizes a 9'-0" wide and 18'-0" long standard stall, and up to 20% compact spacing per City of Portland Design Standards at 8'-0" wide and 15'-0" long. The drive aisles will be sized at 24' in overall width.

Project Overview

Capacity, expansion, aesthetics and size of the parking structure were taken into consideration for three options developed as part of the programming effort so the design features of each could be evaluated. It is also the understanding that a larger structure could have an undesirable impact on the site by restricting view corridors and clashing with the scale and architectural character of the surrounding buildings. All of the concept designs therefore top-off at 55'-0" above the existing surface lot to match with the scale and massing of the adjacent buildings.

The Parking Options include:

1. Arcing garage form that responds to the lot line along I-295 with internal circulation ramp connecting all levels of parking and providing site relief and view corridors towards the proposed future graduate center location adjacent to the Library/Osher Map buildings.

2. Rectangular multi-level garage with internal circulation ramp connecting all levels of parking and skybridge connection to the existing garage at the second level.

3. Level-deck expansion scenario to the existing garage with independent access to each level and radial internal circulation ramp providing site relief and view corridors towards the proposed future graduate center location adjacent to the Library/Osher Map buildings.

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Parking Design Option 1: Arcing garage form that responds to the lot line along I-295 with internal circulation ramp connecting all levels of parking



FIFTH ~ 53,315 SF @ 308 SF/EA (173 SPACES)

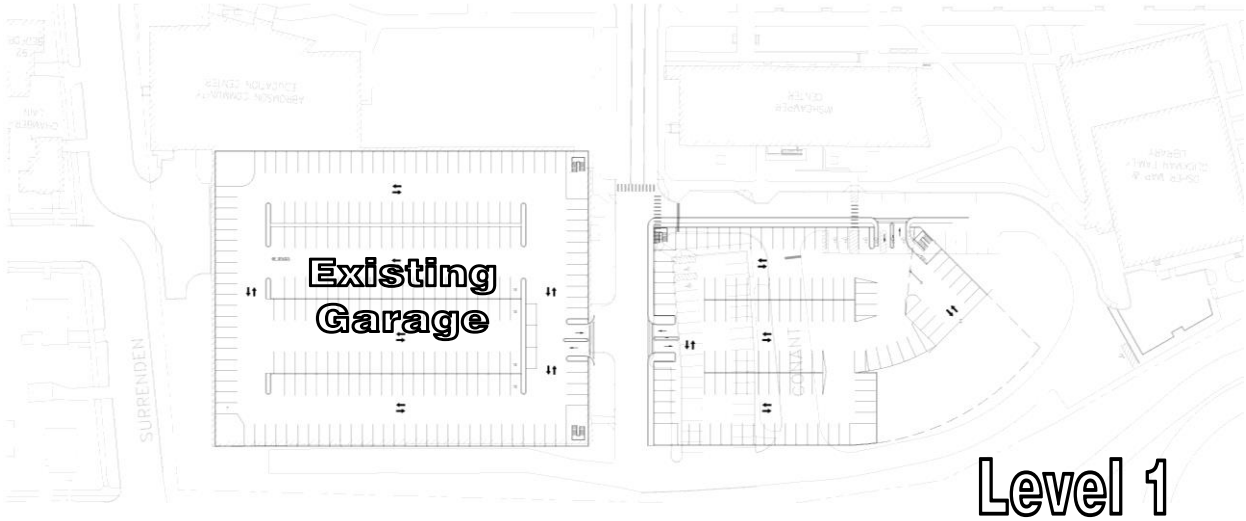
FOURTH ~ 49,715 SF @ 309 SF/EA (161 SPACES)

THIRD ~ 49,715 SF @ 309 SF/EA (161 SPACES)

SECOND ~ 49,715 SF @ 309 SF/EA (161 SPACES)

FIRST ~ 37,560 SF @ 341 SF/EA (110 SPACES)

TOTAL ~ 240,020 SF @ 313 SF/EA (766 SPACES)



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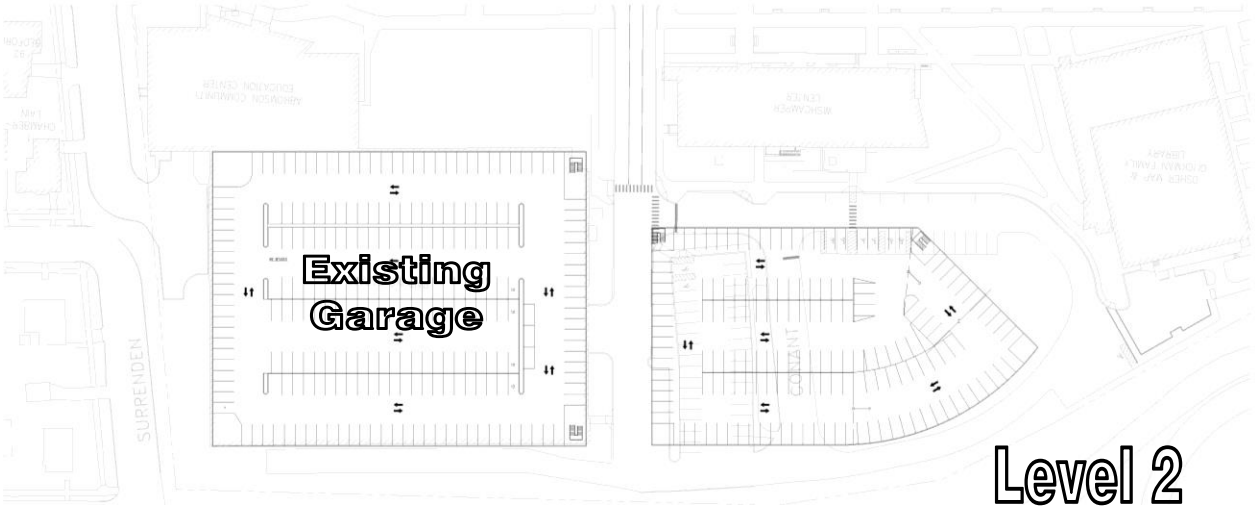

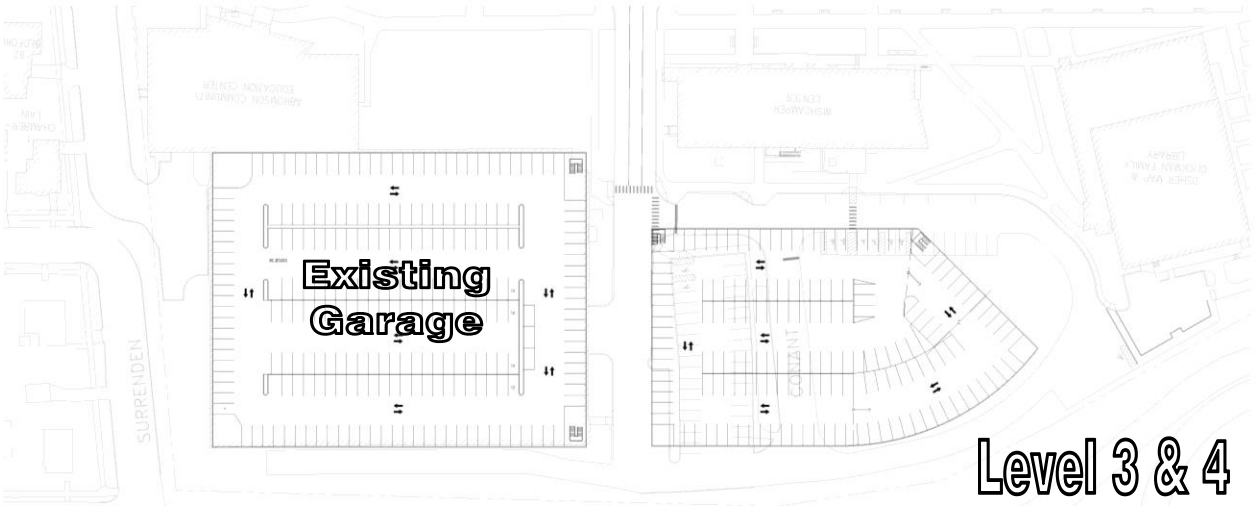

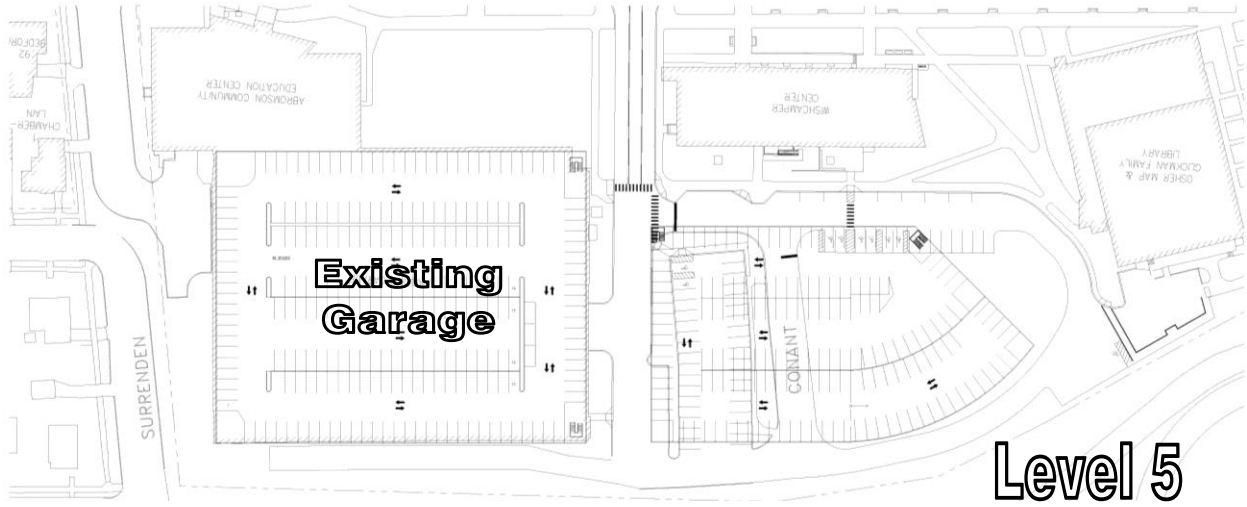

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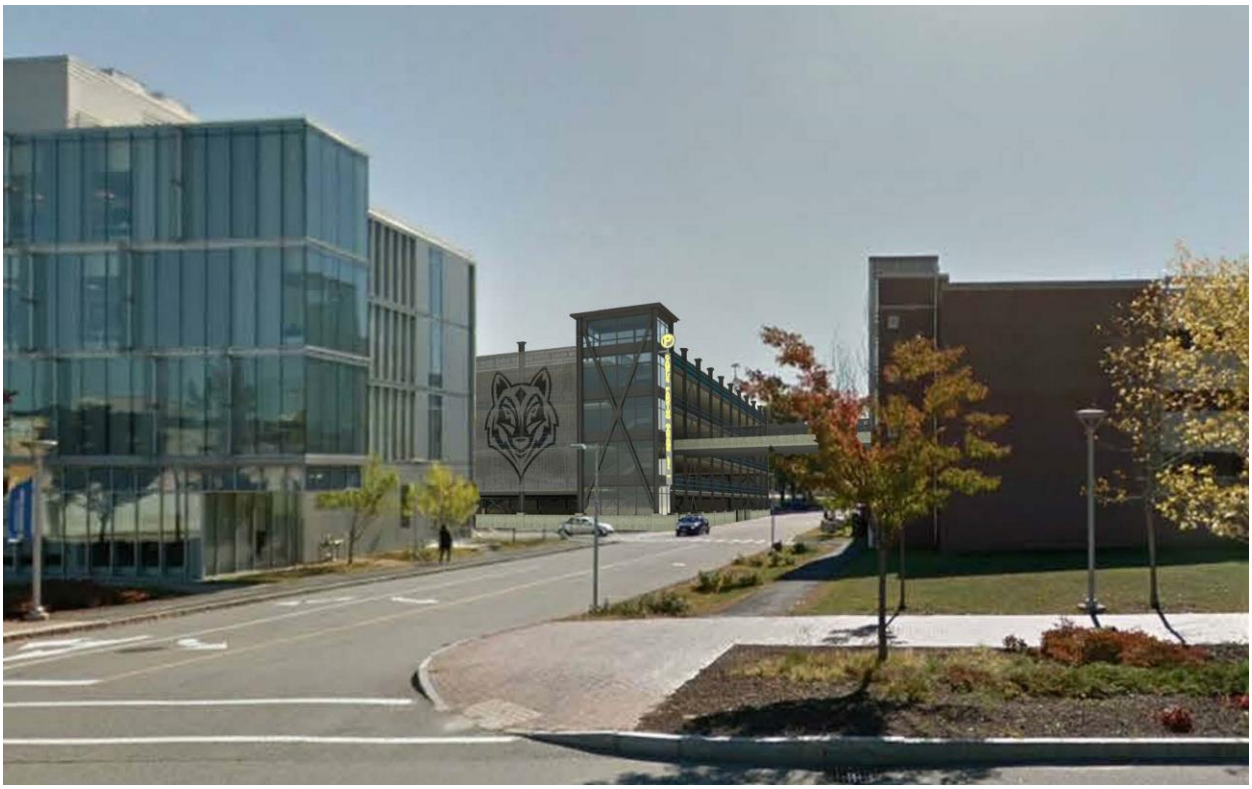
Parking Design Option 2: Rectangular multi-level garage with internal circulation ramp connecting all levels of parking and skybridge connection to the existing garage at the second level.



FIFTH ~ 47,575 SF @ 311 SF/EA (153 SPACES)

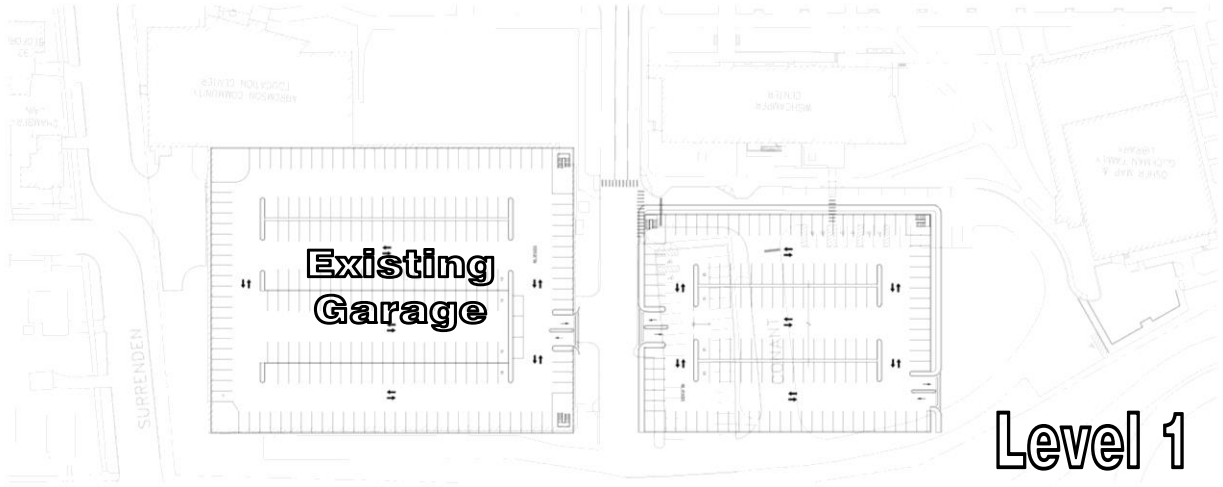
FOURTH ~ 46,475 SF @ 318 SF/EA (146 SPACES)

THIRD ~ 46,475 SF @ 318 SF/EA (146 SPACES)

SECOND ~ 46,475 SF @ 318 SF/EA (146 SPACES)

FIRST ~ 46,475 SF @ 334 SF/EA (139 SPACES)

TOTAL ~ 233,475 SF @ 320 SF/EA (730 SPACES)



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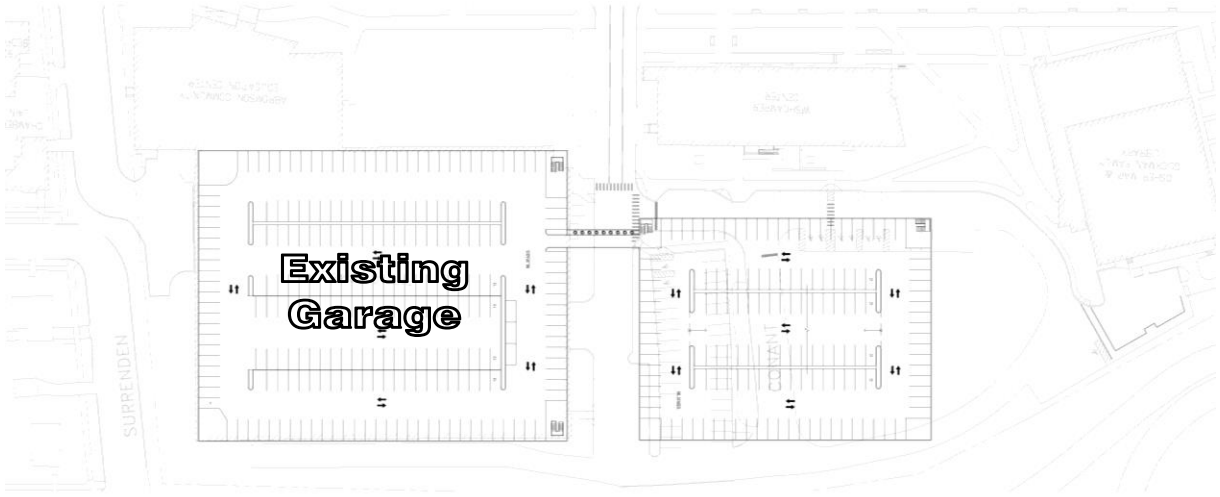

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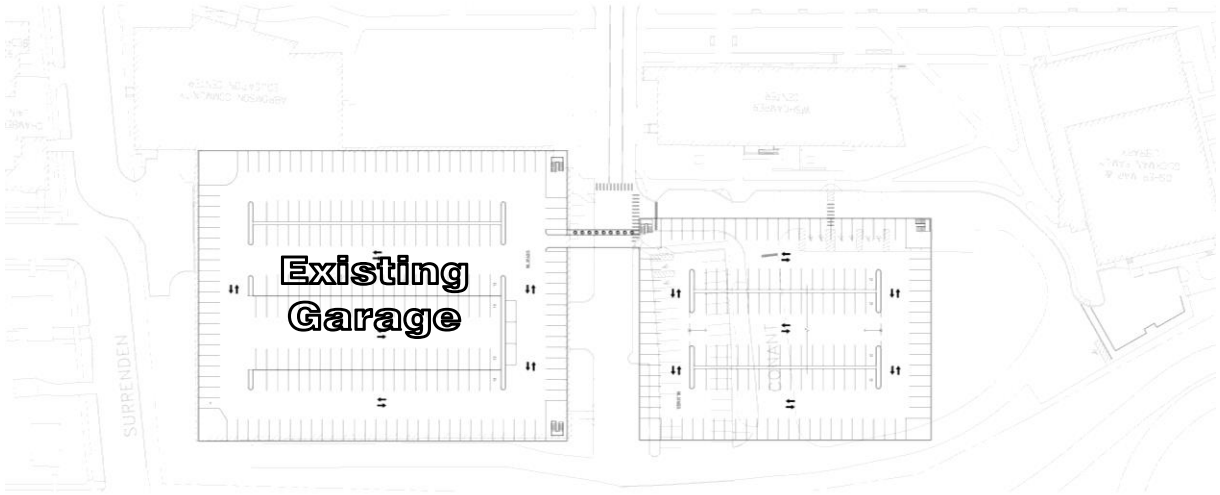

Level 5

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Parking Design Option 3: Level-deck expansion scenario to the existing garage with independent access to each level and radial internal circulation ramp

FIFTH ~ 53,315 SF @ 308 SF/EA (173 SPACES)

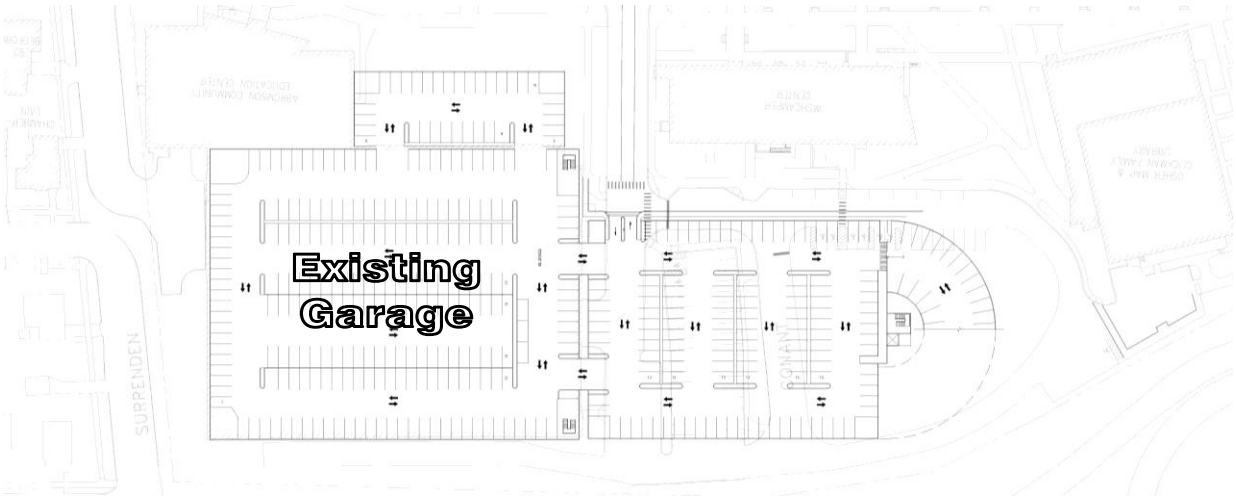
FOURTH ~ 49,715 SF @ 309 SF/EA (161 SPACES)

THIRD ~ 49,715 SF @ 309 SF/EA (161 SPACES)

SECOND ~ 49,715 SF @ 309 SF/EA (161 SPACES)

FIRST ~ 37,560 SF @ 341 SF/EA (110 SPACES)

TOTAL ~ 240,020 SF @ 313 SF/EA (766 SPACES)



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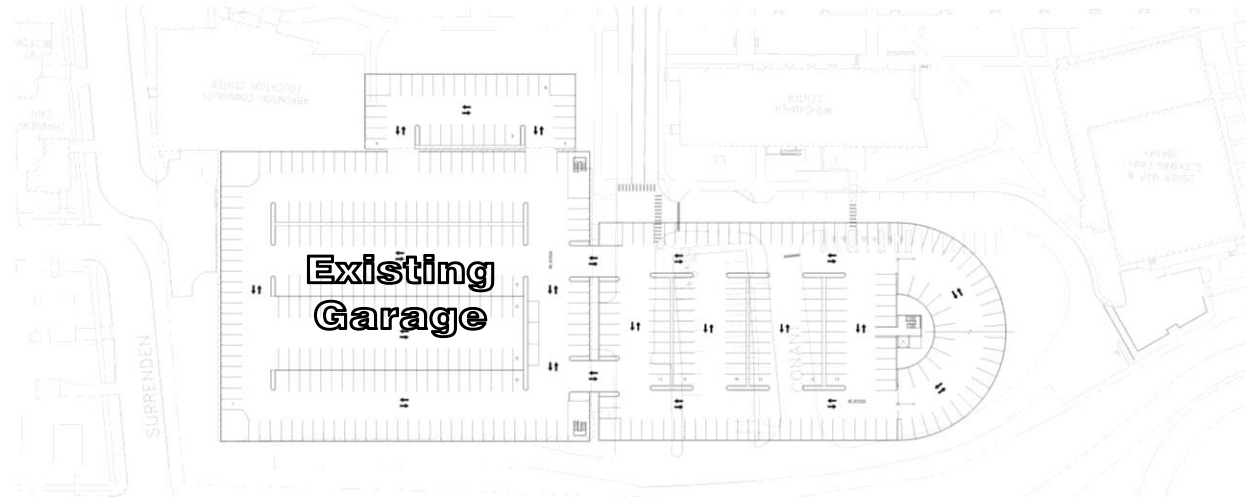

Level 3-5

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Design Budget and Proposed Project Timelines

Costs of Modifying Precast Structural System

Parking Design Option 3 investigates the modification of the existing precast parking structure to expand the parking field with level parking decks and two drive aisles. While a steel-framed parking garage is easily modified post-construction, that is not the case with precast structures. Every element of a precast garage is performing a structural task that would need to be replaced in some form, and due to the heavy loads that precast garages produce, this task is potentially expensive. Cutting into shear walls or even spandrel façade elements might require moment frames and/or removal of the precast tees for a lighter steel-framed system in the area(s) affected. Additionally, the structural piers have been designed for a certain loading, so additional loads would likely need to be carried by separate adjacent footings/piers.

Design Budget

With the Design-Bid-Build project delivery method, the actual costs of the project are not known with certainty until the bid opening, and are also affected by seasonal availability, the state of the current bid environment, and the complexity of the design as it relates to the available pool of responding contractors. That being said, there are a number of factors that can be used to gauge the pricing performance of the garage design relative to the resultant parking efficiency and the number of special features required for the project.

The current 2019 Means Construction Data pricing guide identifies the average cost of a surface parking space is in the $2,500-$3,000 range, structured parking with elevated decks and an open design in the $18,000-$22,000 range, structured parking with elevated decks in a closed design in the $20,000-$24,000 range, and underground parking with a closed design in the $30,000-$35,000 range. The range of these baseline costs should be considered primarily against the backdrop of the resultant parking efficiency on a square-foot basis, but also the specific project program requirements, such as; vehicular entry, ramping, enclosure, ventilation, and pedestrian access. Due to the highly-efficient nature of the options developed in this parking feasibility study, at approximately 315 sf per space, the average square foot cost of around $45 per square foot for a typical steel-framed parking structure would result in a per-space cost of $14,200.

Proposed Project Timeline

Due to the highly variable impact of the City of Portland design review process, in addition to the review and approval procedure timeline for the University's Capital Improvements process, just to name a couple of possible schedule impacts, the exact project timeline is difficult to determine and some degree of flexibility should be considered when forecasting the project approvals timeline. Also figuring into the early project timeline is the project budget pricing requirements, and the design development gaps afforded to these pricing efforts during design. To accelerate the construction schedule, fast-track techniques, performing parts of the construction effort under winter conditions, and possibly selecting a deck system that does not require a traffic topping may be considered.

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The schedule requirements for the major design segments and project approvals would be as follows:

- Preliminary Garage Design and Civil Design Document Preparation……. 2 month duration
- City of Portland Planning Board Approval Process…….. 3 month duration
- Design Development and Construction Document Preparation……. 3 month duration
- Project Bid and Contractor Award……. 1.5 month duration
- State Fire Marshal and Local Permit Approvals ……..... 2 month duration
- Site and Building Construction ……. 8-10 month duration

A general timeline for a steel-framed parking garage design and construction that would take best advantage of the traditional construction season with a Spring ground-breaking would be as follows:

- Preliminary Garage Design and Civil Design Document Preparation…….. Aug-Sept 2019
- City of Portland Planning Board Approval Process……. Aug-Oct 2019
- Design Development and Construction Document Preparation……. Sept 2019-Nov 2019
- Project Bid and Contractor Award……. Dec 2019-Jan 2020
- State Fire Marshal and Local Permit Approvals ……..… Dec 2019-Jan 2020
- Structural Steel Shop Drawing Prep and Fabrication…… Feb 2020-May 2020
- Site and Building Construction …… March 2020- Nov 2020

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Exhibit A. 2019 University Of Southern Maine Facilities Master Plan

UNIVERSITY OF SOUTHERN MAINE | FACILITIES MASTER PLAN



400,000 GSF | *Site available for academic, housing, parking or athletic growth beyond current program*

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Exhibit B. 2018 University Of Southern Maine Aerial Photo





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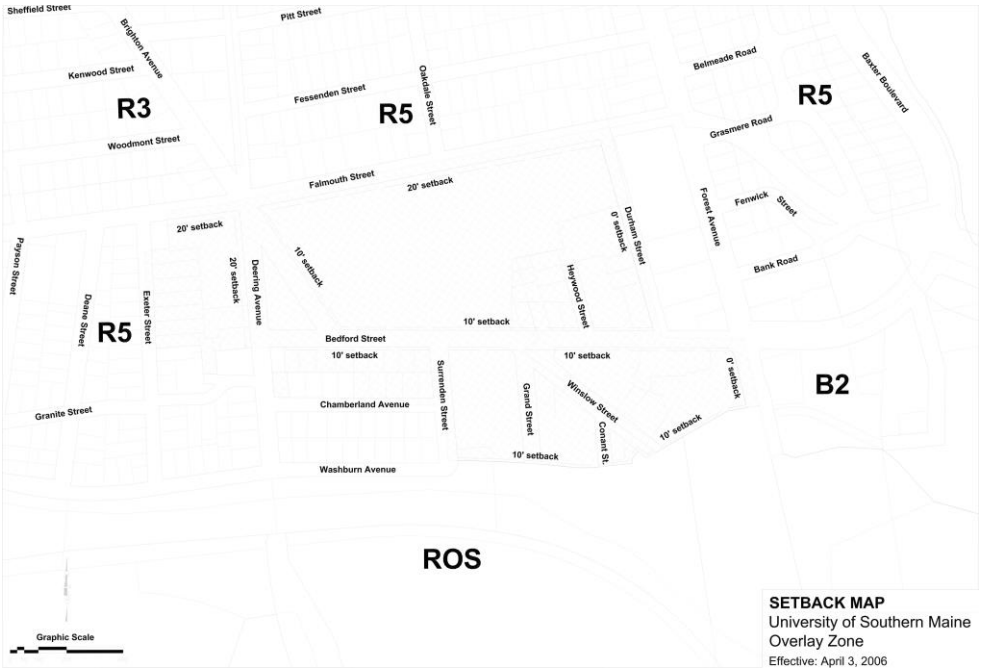
Exhibit C. University Of Southern Maine Zoning Overlay Plan



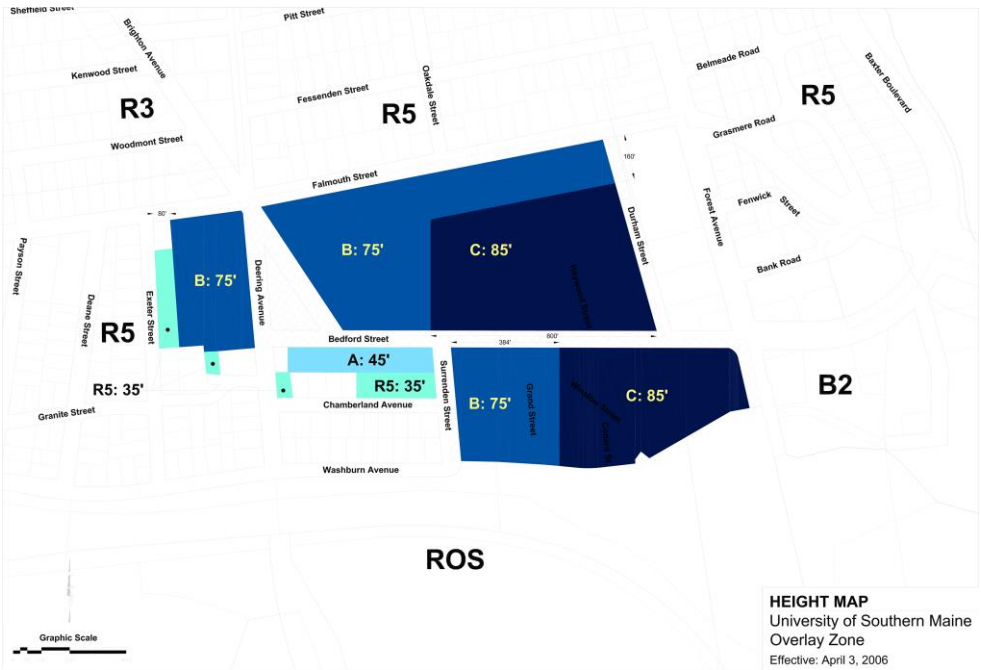


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Exhibit D. University Of Southern Maine Utilities Overlay Plan

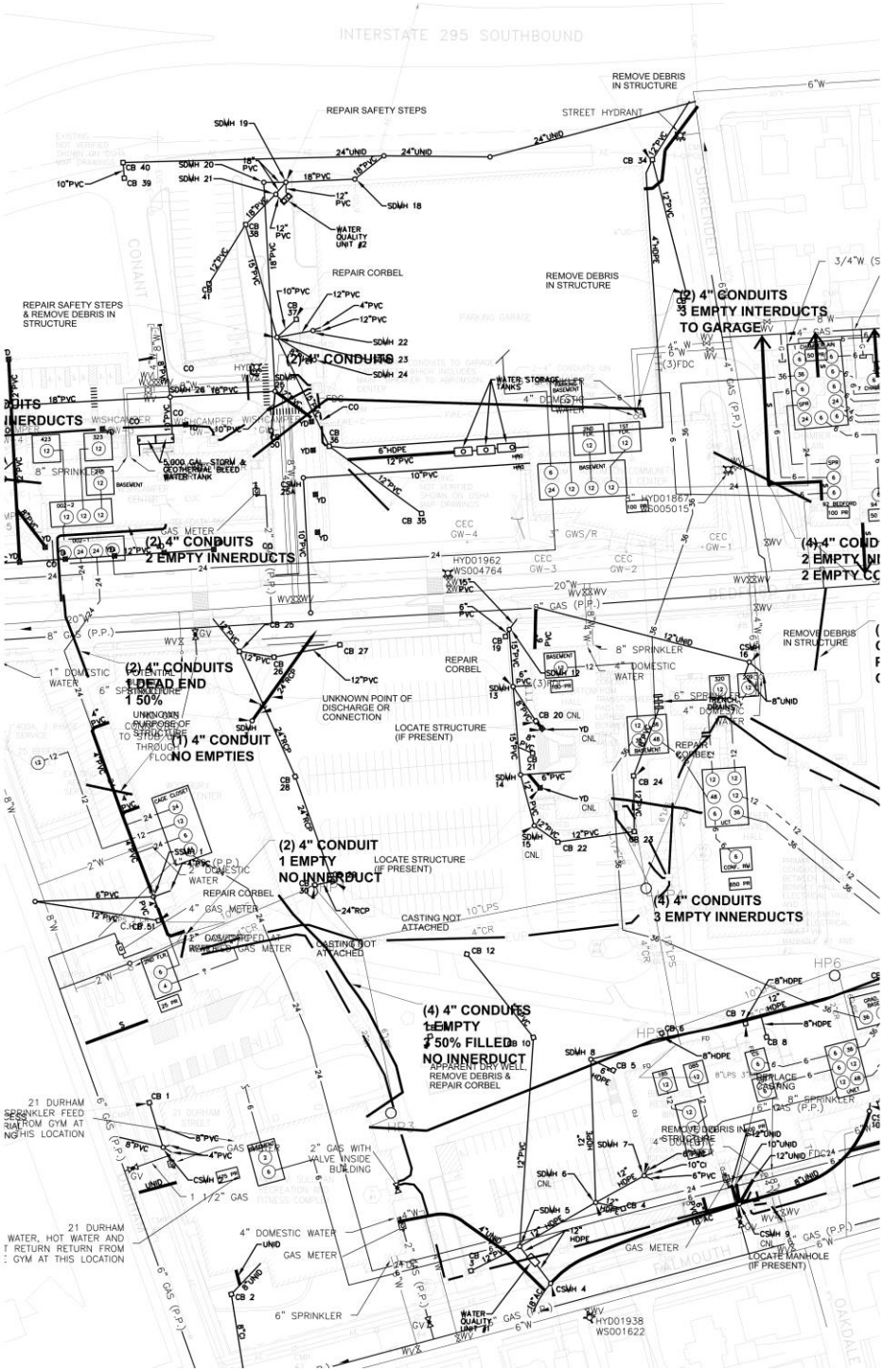

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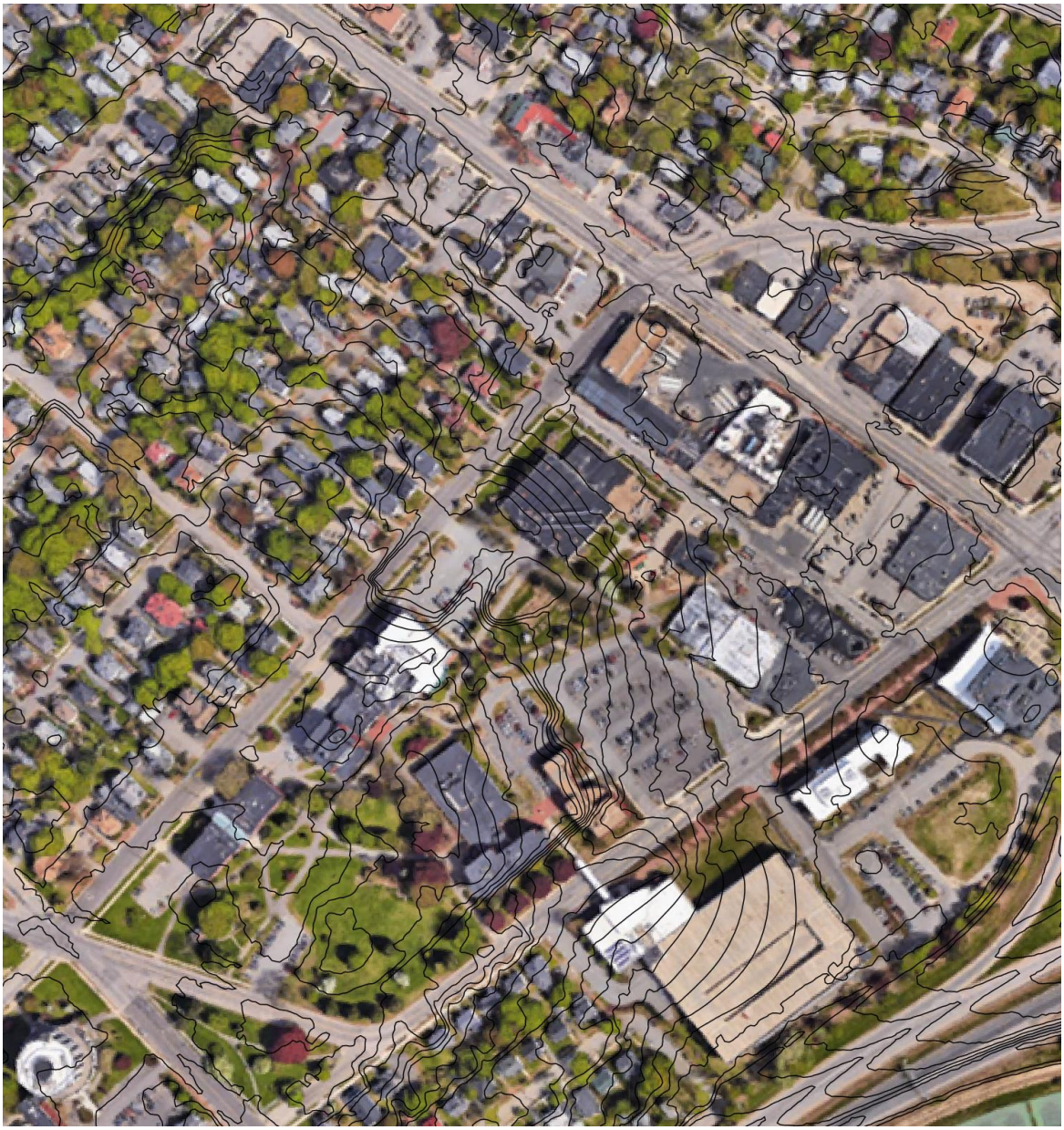
Exhibit E. University Of Southern Maine Topography Overlay Plan



Memorandum

To: Aaron Witham
University of Southern Maine

Date: March 5, 2020

Project #: 55325.00

From: Jennifer Conley, PE, PTOE

Re: Traffic Impact Analysis for Residence Hall, Student Center and Parking Garage

---

VHB has conducted a Traffic Impact Study (TIS) for the proposed development of a Residential Hall and Student Center at the University of Southern Maine (USM). Although a parking garage is not the subject of the current permit application, for the purposes of the traffic analysis, the proposed parking garage was included because in the long term, trips to and from the residences will also be traveling to the new parking garage. The 580-bed residence hall will be located on the corner of Bedford Street and Durham Street. The new Student Center will be located to the west of the residence hall, set back from Bedford Street. Vehicular access for loading will be provided to the sites via a lot off of Durham Street. Pedestrian access to the dormitory will be via a front entrance on Bedford Street, an entrance on Durham Street and an entrance across from the Student Center. The main entrances to the student center will face the lawn towards Bedford Street with an additional entrance to the rear of the building.

Although the parking garage is not included as a part of the initial permitting effort, the permitting for the parking garage is expected to closely follow the application for the dormitory and student center. In addition, a number of the residents of the proposed dormitory are expected to be students who may bring cars to campus, the parking supply is anticipated to soon become necessary. As such, it made sense for the traffic impacts of the parking garage to be included in this traffic analysis. The parking garage will be located on the site of the existing Sullivan Gym lot (between the Sullivan Gym and the Science Building), between the Student Center and Falmouth Street. For the purpose of this analysis, the parking garage is anticipated to supply between 400 and 500 spaces accessed via Falmouth Street. The garage is intended to primarily serve the new dormitory with excess supply to be distributed to either staff, visitors, or commuter students, as needed.

The Traffic Impact Study is summarized within this document, which contains:

- a description of the site and existing transportation network in the study area;
- a description development program for the site;
- a trip generation and distribution estimate for the proposed development;
- an evaluation of traffic operations at key nearby intersections; and,
- a set of conclusions and recommendations to support the project.

Existing Conditions

The existing conditions in the vicinity of the proposed development as outlined above were reviewed. As indicated, the proposed development is expected to occur on the northwest corner of the intersection of Bedford and Durham Streets and the proposed parking garage is to be located on Falmouth Street between Brighton Avenue/Deering Avenue and Forest Avenue. As such, likely points of vehicular access will be via either end of Falmouth Street. The intersections of Falmouth Street at Forest Avenue (signalized) and Falmouth Street at Brighton Avenue/Deering

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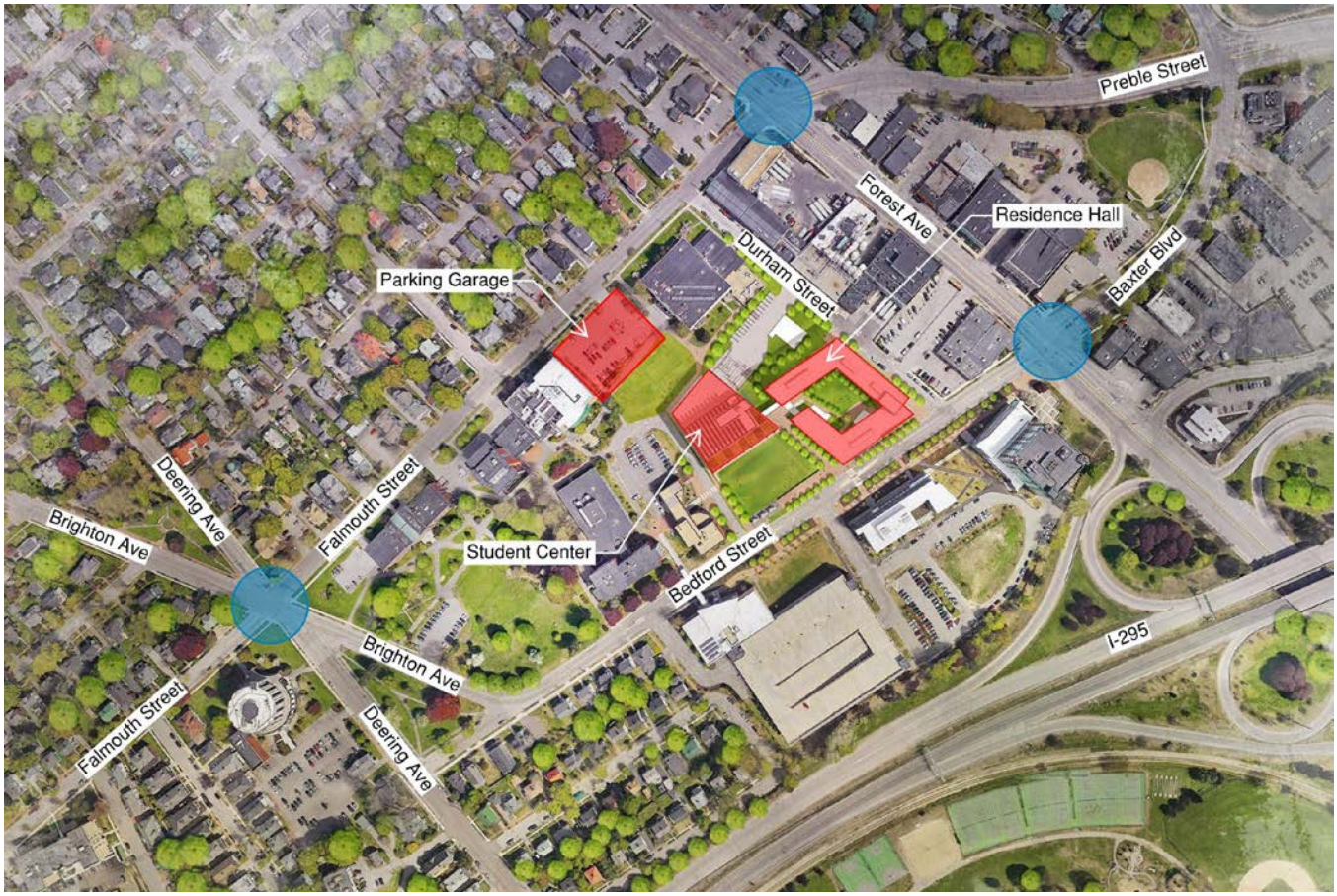
South Portland, Maine 04106

Avenue (signalized, but soon to become a roundabout) were studied. In addition, because the existing parking garage is located on Bedford and until the proposed garage is opened, access will likely be via Bedford Street, the intersection of Forest Avenue at Bedford Street was also studied.

A review of existing conditions focused on the project site and transportation network access to and from the site as depicted in **Figure 1**.

Figure 1: Study Area



Existing Roadway Characteristics

The proposed development will be located on the USM campus on the block located between Bedford Street, Forest Avenue, Falmouth Street, and Brighton Avenue. Forest Avenue is an arterial running northwest to southeast through Portland. In the vicinity of the project site, Forest Avenue (numbered Routes 302 and 100) consists of two through lanes in each direction in addition to turn lanes at some of the signalized intersections. Despite already providing some pedestrian, bicyclists and transit accommodation, Forest Avenue has recently been the focus of a corridor study to determine how to allocate the right of way in order to better serve all users.

Bedford Street intersects with Forest Avenue just north of the I-295 ramps at a four-way signalized intersection with Baxter Boulevard and extends less than 1700 feet to its end at Deering Street. Bedford Street is serves two-way traffic in a single lane in each direction with turn lanes when needed. The roadway is punctuated by pedestrian crossing locations providing access to USM buildings on both sides of the street. The proposed dormitory will abut Bedford Street and the student center will face it over a green area. Bedford Street also provides access to the existing parking garage.

Brighton Ave extends west and north from where it intersects with Bedford Street at an unsignalized intersection and continues 15 miles (under different names) until it intersects with Route 302 in North Windham, providing access to the campus from a number of communities to the west and north. Although Brighton Avenue currently forms the end of this block, future plans will reconfigure this area. Brighton Avenue consists of a single travel lane in each direction along with bicycle accommodation in both directions as well as parking in the eastbound direction. West of Brighton Avenue, Bedford Street consists of a single travel lane towards Brighton avenue and operates under Stop control.

The intersection of Brighton Avenue at Falmouth Street and Deering Avenue is a six-way signalized intersection that is scheduled to be converted into a roundabout, with construction beginning in the spring of 2020. This intersection is currently accessed by six two-way roadways and experiences congestion, confusion, and safety issues. The intersection experiences high pedestrian volumes and has sidewalks and crosswalks on all legs.

Falmouth Street, while primarily residential, is one of the few continuous east-west streets connecting Saint John street and Forest Avenue. Between the intersections of Brighton Avenue/Deering Street and Forest Avenue, Falmouth Street consists of a single travel lane in each direction with parking and sidewalks provided on both sides of the street. Falmouth Street will ultimately provide access to the proposed garage anticipated to serve primarily residential students.

Falmouth Street intersects Forest Avenue and Preble Street to form a four-way signalized intersection. This intersection was also considered for improvements in the previously mentioned corridor study that included Forest Avenue.

Existing Traffic Volume Data

Turning movement count data was collected at the study area intersections of Forest Avenue at Bedford Street; Forest Avenue at Falmouth Street and at Falmouth Street, Brighton Avenue and Deering Avenue. Traffic data was collected on Tuesday February 25, 2020 when both USM and local Portland schools were in session. The weather was cloudy and approximately 40-degrees. Data was collected during the typical peak commuter peak periods, 7:00 to 9:00 AM and 4:00 to 6:00 PM. The peak hour occurred from 7:30 to 8:30 AM and 4:30 to 5:30 PM at the three study area

intersections. Data adjustments were researched to determine the design hourly volumes at these locations. Traffic count data from MaineDOT was reviewed and a weekly mean factor of 1.02 and the highest volume week adjustment of 0.89 were applied to the volumes to result in design hourly volumes. All traffic volume data is provided in the appendix.

Existing Campus Parking Demand and Commuter Trip Patterns

USM conducted a parking study in October 2019 and found that the parking demand is at or above 80 percent of the parking supply from 10:00 AM to 4:00 PM and peaks at over 90 percent from 1:00 to 3:00 PM on weekdays. Outside of those hours, there is little parking demand on-campus.

The majority of the commuting students park in the existing campus garage. The number of trips entering and exiting the existing USM garage were obtained for a typical school week in October 2019. A review of the data collected between Tuesday, October 21, 2019 and Thursday, October 23, 2019 has revealed that the commuter student trips peak from 11:00 AM to 12:00 PM when the trips entering the garage are almost equal to the numbers leaving the garage. 10.5 percent of the day's trips typically occur between this time period. The hours of 8:00 to 9:00 AM, 12:00 to 1:00 PM, 2:00 to 3:00 PM and 4:00 to 5:00 PM generate a similar number of trips with differing directional splits. In the morning, most students are entering. Midday there are some students entering while others exiting and, in the afternoon, most students are exiting the garage. Approximately 10 percent of the daily trips to and from the garage occur during each of these hours. This data suggests that not all students are on-campus at the same time. There are a number of students that leave in the midday peak hour while others arrive at that time.

Future Conditions

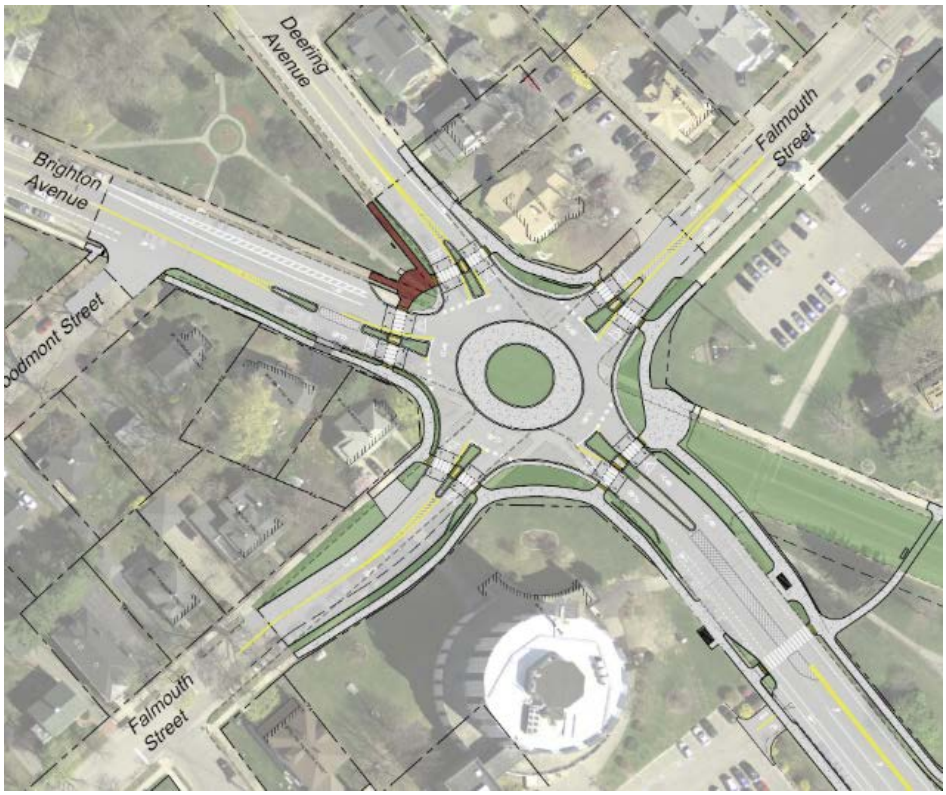
The future conditions in the study area were analyzed both with and without the proposed project. The future traffic volumes and intersection operations for both the project opening year of 2022 and the future horizon year of 2027.

Infrastructure Improvements

The future conditions for the study area include a significant infrastructure change at the intersection of Falmouth Street, Brighton Avenue and Deering Avenue. Beginning in Spring 2020, construction will begin at this signalized intersection to create a roundabout. As shown in Figure 2 from the City of Portland website, the eastern leg of Brighton Avenue will be discontinued, and the traffic redirected to the southeast Deering Avenue leg of the intersection. The remaining five legs of the intersection will form the new roundabout. With constructed starting shortly, this intersection will be analyzed as a roundabout in all scenarios.

The traffic volume data collected at the intersection of Falmouth Street, Brighton Avenue and Deering Avenue was redistributed to represent the volumes that will exist at the five-leg roundabout in the future, rather than the current six-leg condition. The proposed roundabout design is presented in **Figure 2**.

Figure 2: Proposed Roundabout at Falmouth Street, Brighton Avenue and Deering Avenue ***(City of Portland)***

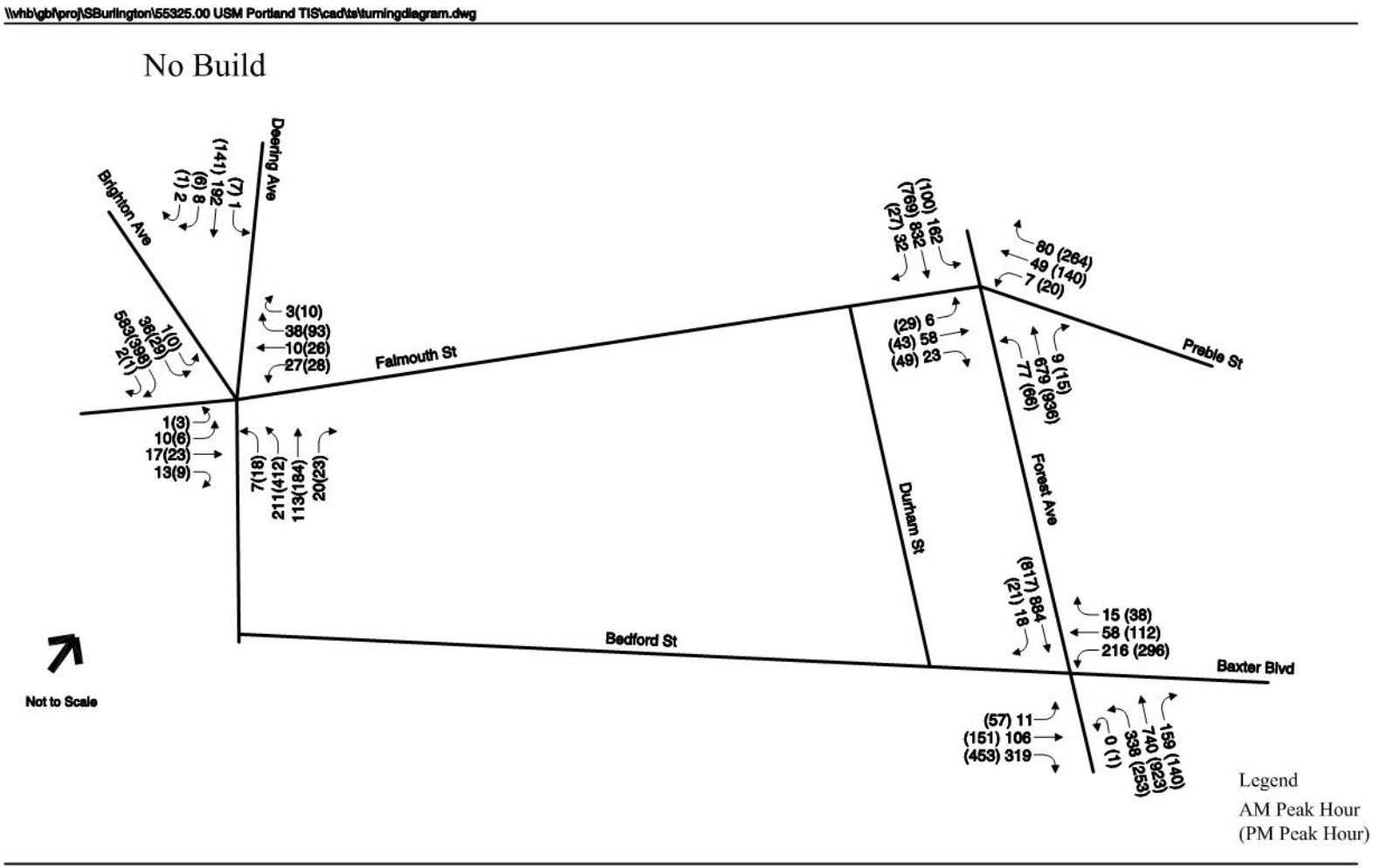


In addition to the impending improvements at Falmouth Street, Brighton Avenue and Deering Avenue, the *Portland-South Portland Smart Corridor Plan* evaluated alternatives for improving traffic operations along Forest Avenue. As a part of a DPW water resources project, the striping changes have been incorporated to better serve cyclists at these intersections. Adaptive traffic signal control will be in place at these signals shortly. This technology will allow for a more responsive signal system that, for example, ends green time for approaches that do not have traffic on them and lengthens green time for approaches with additional demand. For the purposes of the analysis, the signal timings from the *Portland-South Portland Smart Corridor Plan* were field checked in used as a baseline operation.

Background Traffic Volume Adjustments

The *Portland-South Portland Smart Corridor Plan* identified sites along the corridor where potential large developments could occur and included projections for those developments in the Planning Study (each of which was outside of this immediate study area). With a seven-year time horizon and no defined plans for those sites, that approach is not appropriate for this traffic analysis. Instead, a one percent per year background growth rate was applied to the traffic volumes to account for any smaller projects that are contemplated in the area and could affect traffic volumes at the study area intersections. This annual growth rate is consistent with the growth rate used for the roundabout analysis. **Figure 3** illustrates the 2027 No Build traffic volumes.

Figure 3: 2027 No Build Traffic Volumes



Trip Generation

VHB has evaluated the trip generation of the proposed campus developments. Although only the 580-bed residential hall and new Student Center is currently proposed, the University understands that based on their student profile, it is likely that a number of the dorm beds will be occupied by upperclassmen who will want to bring a car to campus. Therefore, this analysis considers not only the residence space and Student Center, but also the provision of an additional parking facility on-campus.

Approximately 68 percent of residential students at the Gorham campus currently have a parking pass. That percentage is high due in part to the policy that the parking fee is coupled with other fees and not a separate chosen fee. The University is incorporating changes to that program to ensure that bringing a car to campus would be an additional cost and a choice made by students. In addition, the location of the Portland campus is more likely to work with a car free lifestyle as there are transit opportunities and destinations nearby for walking and biking.

Adding residential beds to a campus typically will reduce vehicle trips if enrollment is expected to remain the same. A portion of the student body who were previously commuting to and from the campus each day, now will reside on-campus and walk to classes. The students with cars will occasionally use them to drive to recreation or commercial establishments and others may get vehicular deliveries or visitors, but the reduction in the typical peak hour trips is usually significant.

The proposed Student Center is not expected to generate a significant number of trips as it is an expansion of an existing use on the campus and is expected to continue to serve the student population. With the improved facility, it is possible that additional special events could occur that would generate additional trips, but if they were to occur, the traffic would be intermittent and not generate a typical trip generation.

The most significant generator of trips on a college campus is typically increases in enrollment. Enrollment has been slowly growing in recent years, but may have been limited due to a lack of on-campus housing. Recently, demand has been high for on-campus housing at the Gorham campus, resulting in 210 students being housed in triples (rooms with two other students). This indicates that there is already demand for 210 additional beds. In addition, based on surveys, the University has identified that 296 additional undergraduate students and 106 existing graduate students currently are living off-campus that would like to be in on-campus housing. It is also likely that a number of students have opted to attend other Universities that could accommodate them in on-campus housing (in less than a triple room).

Short-Term Trip Generation

In the short term, based on the needs of the existing students, it is likely that a number of commuter students to the Portland Campus (either from Gorham or from off-campus housing) will convert to on-campus residential students. Based on the existing known demand, as many as 210 Gorham residents who are living in triples and up to 402 students who are living off-campus (296 undergrad students and 106 grad students) who currently commute would likely convert to residential students. This would fill the 580 beds on the Portland campus. Of these students, many of them will not generate even one vehicle trip on a typical day. Others will have classes on the Gorham campus and become a commuter in the opposite direction. A few other trips will be generated for eating, shopping, part time jobs

and recreation in the area. Portland commuters who will no longer be commuting as they become on-campus residents.

The University conducted a survey that found that students at the Portland campus currently commute by the rounded percentages listed below.

Portland Campus Mode Shares:

- 70% drive alone
- 10% use transit
- 10% walk or bike
- 10% carpool

As such, if 580 commuter students were removed from the campus, that would result in approximately 858 fewer vehicle trips per day (400 people driving alone is 800 trips and 58 people in 29 carpools is 58 trips). However, as indicated above, a percentage of the new residential students will originate from the existing residential facilities in Gorham. For trips just between the two schools, the transit percent is significantly higher.

Mode share between Portland and Gorham campuses:

- 40% drive alone
- 40% use transit
- 20% carpool

If all of the 580 Portland residential students had been previously coming from Gorham moved on-campus, the trip reduction would be 580 trips (232 people driving alone is 464 trips and 116 people in 58 carpools is 116 trips).

With 210 of the new residential students coming from the Gorham campus and the remainder coming from the general commuting population, the number of trips to the campus will be reduced by 680 trips.

Portland on-campus residents who may commute

However, a number of these new on-campus residents may have classes at the Gorham campus. If one half of the Portland campus residents have courses at the Gorham campus, and the mode share is consistent with the students coming from Gorham to Portland, then there would be 116 students driving alone to the other campus and 58 in carpools resulting in 290 new vehicle trips related to the residents commuting to that campus.

Other Trips

As indicated above, on any given day, it is likely that 10 percent of the residential student population will make a trip off-campus. Based on the urban location of the campus, it is likely that a number of these trips will be made via alternate modes like walking and biking. The *Walkscore* website lists USM at a Bikescore of 93 out of 100, the equivalent of a "Biker's Paradise" As the entire Portland peninsula can be accessed within 2 miles of USM. Within 5 miles, one can reach South Portland to the south, Westbrook to the west, and the border of Falmouth to the north.

However, to be conservative, it was estimated that each of these trips would occur via personal vehicle. This would result in a trip increase of 100 vehicle trips per day.

Total Short-Term Trips

Combining the trip reduction associated with commuters converting to residents with the reverse commuter trips and other trips results in a total trip reduction of 290 vehicle trips per day, a large percentage of them being removed during the campus peak hours. Although the number of trips would decrease significantly, the total parking demand would likely remain constant as vehicles that are currently parked elsewhere the majority of the time (overnight, non-class hours) will now be stored on-campus for a longer portion of the day. In some cases, vehicles may be used to travel to other campuses during the day creating an available space for a student coming to the Portland campus. However, instead of the peak parking demand occurring for just a few hours midday, these vehicles would be parked on-campus most of the time.

Long-Term Trip Generation

As indicated above, the off-campus trip generation of the Student Center is expected to be minimal with the exception of special events. Similar to the short-term trip generation, the dorm beds are expected to result in a net loss of trips. Even the parking garage itself will not generate traffic unless demand is anticipated to increase to serve a new traffic generator.

The driver of long-term trip generation will be an increase in the student population. USM is projecting that the student body will increase by 972 students (or 706 full time equivalents) between now and 2027, the five-year time horizon after completion of the student housing and Student Center. Of that increase, 580 are expected to be housed in the residence hall, leaving an increase of approximately 390 students that will commute (whether from another campus or from off-campus) to the Portland campus.

New commuter trips

As noted above, surveys indicate that of the students that commute to the Portland campus, 70 percent of them drive alone and 10 percent of them carpool. Applying these rates to the 390 students results in 273 students driving alone (273 entering and 273 exiting) and 40 students in carpool (20 entering and 20 exiting) for a total of approximately 590 daily commuter vehicle trips to and from the campus. Applying the trip characteristics observed over the course of the day at the existing garage results in a peak trip generation of 58 vehicle trips from 8:00 to 9:00 AM, 62 vehicle trips from 11:00 AM to 12:00 PM, 60 vehicle trips from 2:00 to 3:00 PM and 52 trips from 4:00 to 5:00 PM.

New residential trips

As outlined above, there are expected to be a number of trips associated with the new residences. Unlike in the opening year when those trips are in place of commuter trips, with the growth of enrollment expected in the five years after opening, the residential students will be above the current enrollment levels. Therefore, the 290 reverse commuting residential students and the 100 miscellaneous trips per day would be increased trips as well. The miscellaneous trips would primarily occur during the off-peak hours in the evenings with few occurring during class time. To be conservative, the 290 reverse commuting trips were estimated to occur at the same times as the

commuting peak on the Portland campus, resulting in a peak hour trip generation of 29 trips from 8:00 to 9:00 AM, 30 trips from 11:00 AM to 12:00 PM, 29 trips from 2:00 to 3:00 PM, and 26 trips from 4:00 to 5:00 PM.

New other trips associated with long term increase in enrollment

With increases in student enrollment, there will be an increase in faculty, staff and other services (most significantly deliveries of all types). A review of the ratio of the number of enrolled students to the number of faculty and staff reveals an anticipated increase of approximately 270 person trips per day (135 entering and 135 exiting). Because most of the existing faculty and staff currently travel by personal auto, it was assumed that the future staff would as well. Faculty and staff are not anticipated to generate many trips during the peak hours of student travel, however, to be conservative, 30 trips were anticipated during each of the student peak hours. It was also estimated that an additional five trips were made during each of the peak hours to account for deliveries, service, maintenance, etc. associated with the increase in enrollment.

Total Long-Term Trip Generation based on USM data

The total long-term trip generation based on USM data indicates that the campus will generate an additional 122 vehicle trips during the weekday AM peak hour and 113 vehicle trips during the weekday PM peak hour.

Table 1: Long-Term Trip Generation Based on USM Information

		Commuter Students[1]	Residential Students[2]	Faculty/Staff/ Other[3]	Parking Garage[4]	**Total Trips**
Weekday AM Peak Hour	Enter	57	0	30	-	***87***
	Exit	1	29	5	-	***35***
	Total	58	29	35	-	**122**
Weekday PM Peak Hour	Enter	10	22	5	-	***37***
	Exit	42	4	30	-	***76***
	Total	52	26	35	-	**113**

[1]Based on anticipated enrollment of 970 additional students, 390 new commuter students anticipated, commuter mode splits and hourly trip pattern at existing garage

[2]Based on 580 dormitory beds, trips to other campuses, mode splits between campuses and other recreational etc trips

[3]Estimates for faculty, staff and other trips

[4] parking garage – trips assigned to generators

Long-Term Trip Generation Comparison

For comparison purposes, an industry standard trip generation estimate for the proposed future enrollment increases was calculated based on rates published by the Institute of Transportation Engineers (ITE) in the 7th edition of the Trip Generation Manual (as per MaineDOT Traffic Management Permit Requirements) and checked against the 10th edition (most recent edition) for any more recent updates. The trip rates were calculated for the weekday AM and PM peak hours using the Land Use Code (LUC) for University/College (LUC 550). These time periods are typically the highest volume times on the adjacent roadway network. One of the USM school peak hours does overlap somewhat with the roadway peak period.

The ITE 7th edition data indicates that the total AM peak hour trip generation of the campus would be 204 trips (163 in and 41 out) and the PM peak hour trip generation of the campus would be 233 trips (70 in and 163 out) without any adjustment for the trip patterns noted as this urban/suburban campus. The more recent ITE data (10th edition) indicates that the campus would generate 126 trips (101 in and 25 out) in the highest AM peak hour and 136 trips (43 and 93 out) in the highest PM peak hour.

The mode shares for the campus (70% drove alone and 10% carpool) were applied to the trip estimates per ITE. The results are illustrated in **Table 2** below as well as the information determined based on the trip patterns at the existing campus garage and other existing campus data.

Table 2: Long-Term Trip Generation – Industry Standards (adjusted for mode share) compared to Local Data

		ITE 7th Edition[1]	ITE 10th Edition[2]	Local Data[3]
Weekday AM Peak Hour	Enter	122	76	87
	Exit	31	19	35
	Total	153	95	122
Weekday PM Peak Hour	Enter	52	43	37
	Exit	122	92	76
	Total	174	135	113

[1]Based on Institute of Transportation Engineers *Trip Generation*, 7th Edition
[2]Based on Institute of Transportation Engineers *Trip Generation*, 10th Edition
[3]Based on data outlined in Table 1 for increased commuter and residential students

Any project which generates 100 or more passenger car equivalents (PCE) trips during the peak hour of traffic generation, must file a Traffic Movement Permit application with Maine Department of Transportation. As outlined above, the project is anticipated to generate between approximately 100 and 200 passenger car equivalents during the peak hours. While the Maine Traffic Movement Permit requires use of the 7th edition of ITE, those rates have been

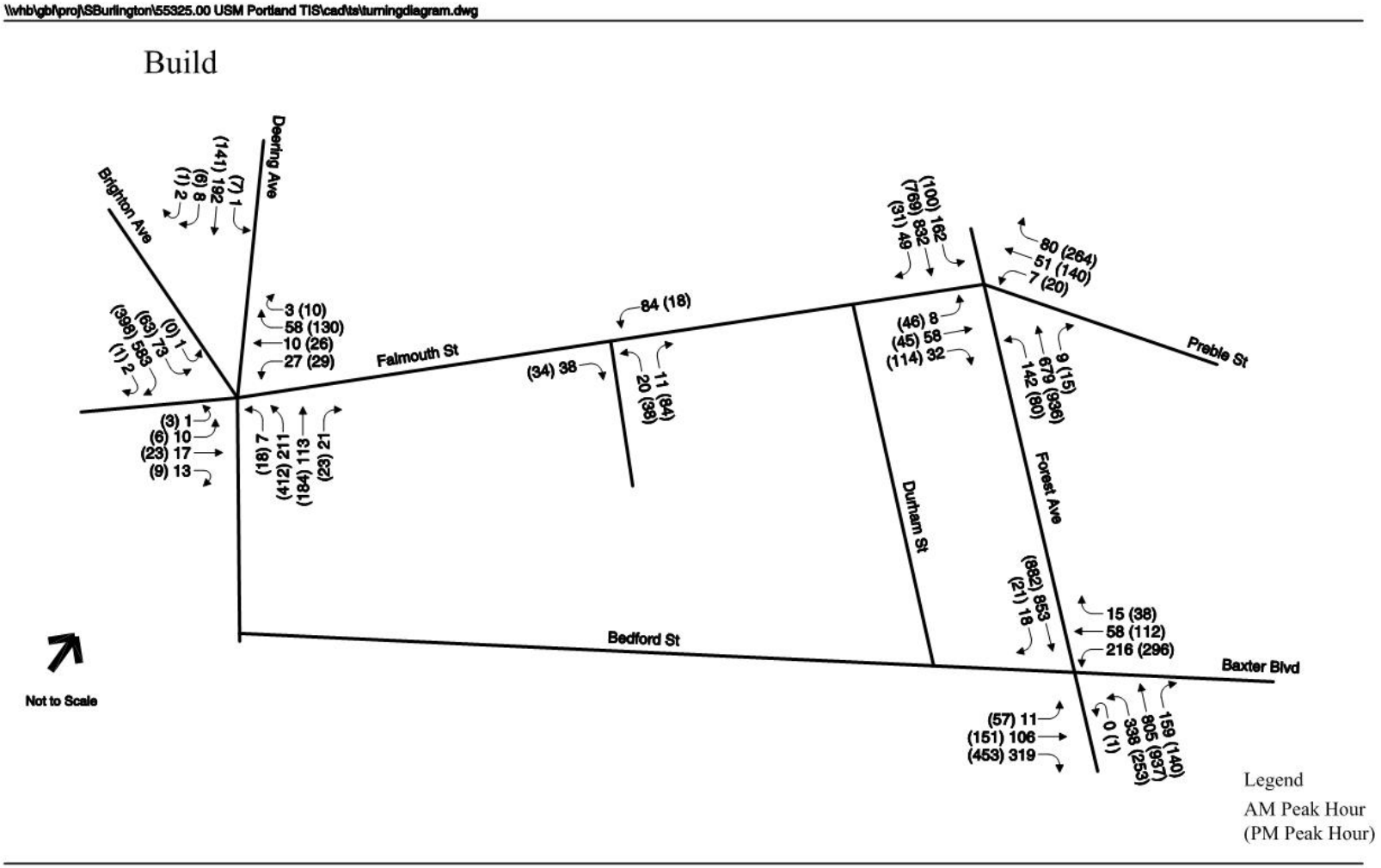
significantly updated in the more recent version and result in data that is more in line with what is expected based on actual campus information. To be conservative and in line with the requirements of the Maine Traffic Movement Permit Data, the ITE 7th edition data was used for the following analysis, however, it was assumed those trips were made up of the components expected on this campus and were distributed accordingly.

TRIP DISTRIBUTION

The various trips generated by the site will distribute in different ways. The residential trips attending classes in Gorham will travel to and from the west on Brighton Avenue. The commuter site-generated trips were distributed onto the adjacent street network based on zip code data for the existing student body, assuming the University will continue to draw from similar geographic areas. Most site trips are anticipated to be generated to and from the south on Forest Avenue with 46 percent of traffic oriented to and from I-295 and another seven percent oriented to and from downtown Portland and parts of South Portland. The next sources of trips are 30 percent to and from Brighton Avenue and 14 percent to and from points north via Forest Avenue. Minor percentages access USM from Deering Avenue points south and Baxter Boulevard. The remaining trips will likely distribute in a similar fashion, with the majority of trips into and out of Portland or onto I-295 and remaining trips to the north and west.

Based on the expected trip distribution, the site-generated trips were added to the 2027 No Build peak hour traffic volumes to establish the 2027 Build networks. The Build networks are shown in **Figure 4**. The trip generation figure is included in the Appendix.

Figure 4: 2027 Build Traffic Volumes



TRAFFIC ANALYSES

Intersection Capacity Analyses

Intersection capacity analyses were performed for the study area intersections. Levels of service (LOS) were calculated based on the criteria published in the *2000 Highway Capacity Manual*.[1] Level of service is the term that defines the conditions that may occur on a given roadway or at an intersection when accommodating various traffic volume loads. Levels of service range from A to F with LOS A representing generally free flowing operating conditions and LOS F representing generally congested conditions. Synchro 9 was used to determine the LOS at signalized intersections and Sidra Intersection 8 was used to determine the LOS at the proposed roundabout. Copies of the LOS calculations are provided in the Appendix.

Table 4 summarizes the operational analysis at the signalized study area intersections during the 2027 weekday AM and PM peak hours under No Build and Build conditions. As shown, the intersection of Forest Avenue at Falmouth Street is expected to operate at LOS B in 2027. Because the operation was borderline B/C, with the project in place, the operation will become LOS C with only a two second project related delay increase. Even the heavy increase of the Forest Avenue northbound left turns onto Falmouth Street in the morning can be accommodated in the storage length available.

The signalized intersection of Forest Avenue at Bedford Street is expected to operate at LOS D in 2027 both without and with the project. Project related delays are expected to be three seconds or less per vehicle. Even in the No Build condition, without project traffic, a number of movements at this intersection are currently operating at LOS E. The installation of adaptive signal control will ensure that the intersection operates at optimal conditions throughout the day.

Table 4: 2027 Signalized Intersection Operation

Intersection	No Build			Build		
Peak Hour	v/c[+]	Delay*	LOS **	v/c[+]	Delay*	LOS **
Forest Avenue at Falmouth/Preble						
AM Peak Hour	0.48	18.3	B	0.53	20.3	C
PM Peak Hour	0.52	18.7	B	0.54	20.5	C
Forest Avenue at Bedford/Baxter						
AM Peak Hour	0.79	39.0	D	0.79	39.2	D
PM Peak Hour	0.90	45.7	D	0.93	48.8	D

[+] *Volume to capacity ratio*
** Delay expressed in seconds per vehicle*
*** Level of Service*

[1] Highway Capacity Manual, Federal Highway Administration, Transportation Research Board, 2000.

Table 5 summarizes the operational analysis at the Brighton Avenue, Deering Avenue and Falmouth Street roundabout during the 2027 weekday AM and PM peak hours under No Build and Build conditions. As shown, even with anticipated growth and project related traffic, the proposed infrastructure will result in a LOS B or better condition during the peak hours at the roundabout in 2027.

Table 5: Roundabout Levels of Service

Peak Hour	No Build			Build		
Movement	v/c*	Delay**	LOS ***	v/c	Delay	LOS
AM peak hour						
Deering Ave southeast	0.36	4.0	A	0.39	4.3	A
Falmouth Street northeast	0.13	5.5	A	0.16	5.3	A
Deering Ave northwest	0.38	4.8	A	0.39	5.1	A
Brighton Ave east	0.79	9.5	B	0.83	11.5	B
Falmouth Street southwest	0.15	11.4	B	0.16	12.3	B
PM peak hour						
Deering Ave southeast	0.63	4.5	A	0.68	5.1	A
Falmouth Street northeast	0.37	9.4	A	0.48	11.4	B
Deering Ave northwest	0.40	9.7	A	0.43	11.1	B
Brighton Ave east	0.54	4.2	A	0.58	5.0	A
Falmouth Street southwest	0.10	7.2	A	0.10	7.7	A

** Volume to Capacity Ratio*
*** Delay expressed in seconds per vehicle*
**** Level of Service*

The driveway approach of the garage proposed on Falmouth Street is anticipated to operate at LOS B with 12 to 13 seconds of delay during both the AM and PM peak hours.

Transportation Demand Management (TDM)

The University of Southern Maine (USM) has recently developed a Transportation Demand Management (TDM) plan that provides a cohesive strategy for establishing and implementing a successful TDM program for the Portland campus. The TDM plan seeks to enhance multimodal accessibility, ensure the use of non-vehicular modes, and discourage the use of driving through parking management, to achieve and build upon the university's parking demand reduction goals for the campus. The TDM Plan presents a suite of strategies and timeframe for when USM intends to implement the various strategies. The strategies aim at promoting walking and bicycling, improving transit service to promote ridership, promoting carpooling, changing time-of-day travel demands to eliminate or reduce

vehicle trips, and managing parking demand via changes to USM's pricing and permit policies. The implementation of TDM will reduce the vehicle trips to the site and reduce delays at area intersections.

Conclusions

The addition of the dormitory beds to the campus is anticipated to reduce vehicle trips as commuters convert to on-campus residences. The student center is expected to better serve the existing student population and is not expected to increase trips to the campus except perhaps for special events. In the future, with optimistic enrollment increases, and conservative methodology, vehicular trips are anticipated to increase between 163 and 174 during the weekday AM and PM peak hours. With these trips added to the roadway network, delay increases will be minimal at the signalized intersections along Forest Avenue and at the proposed roundabout at Falmouth Street and Brighton and Deering Avenues. Overall, this proposed project is not intended to adversely impact traffic operations in the vicinity of the USM campus.

University of Southern Maine
Portland Commons Residence Hall
Preliminary Plan for Summer/Fall Move-In

Proposed Planning Committee Membership
USM - Transportation Coordinator, Parking Office, Public Safety, Residential Life, Graduate Student
Community – City of Portland, Neighborhood and Oakhurst

Two spring meetings to develop a plan in order to effectively communicate to all stakeholders. An additional meeting in late July or early August to finalize all logistics and an early/mid-September meeting to evaluate the plan and make recommendations for improvement.

Overview
30% (175 students) – SUMMER RESIDENTS & EARLY ARRIVALS - student staff, student-athletes, etc.
returning groups arrive in small numbers during a 10-day to two week period
35% (200 students) Blue Move-In Day
35% (200 students) Gold Move-In Day

Blue/Gold Move-In Days
Students will be assigned different dates (Blue or Gold) and times of the day (8 am to 6 pm) to prevent congestion and long lines. Assignments will be determined by floor & room or Alpha by last name. Each hour time block would have 20 students moving in to the residence hall.

Procedures (for students)
1. Plan to arrive on the assigned date and during the designated time slot
2. Follow directions (up Bedford Street/down Falmouth Street) towards entrance to Durham Street
3. Staff will control vehicle flow and access to Durham Street unloading areas (as space is available) The Sullivan Gym parking lot/garage will be utilized as a vehicle staging area
4. When at unloading area, Student will start the curbside check-in process with Res Life staff
5. When checked-in, student vehicle will be unloaded in designated/approved areas (Heat Plant parking lot on Durham Street)
6. Once items are unloaded, vehicle will be moved to the Bedford Street parking garage
7. Once vehicle is parked in the Bedford Street garage, items will be taken to room by hand or with provided carts

Move-Out Plan
Currently in Gorham, we do not have a move-out plan as students move out sporadically over a two-week period. We would envision a similar process in Portland. The Planning Committee would be charged in March of each year to develop similar procedures for anticipated high-capacity days (Commencement and lease end date).

Notes
The Portland Commons Residence Hall is for Law, Graduate and Upper class students. Very few families will participate in the move-in/move-out process.

Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: 207-287-3901

FOR DEP USE **FORM A PAGE 1**
ATS # _____
L-_____
Total Fees: _____
Date: Received _____

****

SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.SA. §§481-490

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)	☐ **20 acre development** ☐ **Planning Permit** ☐ **Metallic Mining**	☐ **Marine Oil Terminal** ☐ **Structure** ☐ **Subdivision**	■ **Major Amendment** ☐ **Minor Amendment**

1. Name of Applicant:	University of Southern Maine	**6. Name of Agent (if applicable):**	Woodard & Curran, Darrin Stairs
2. Applicant's Mailing Address:	25 Bedford St, Portland, ME 04104	**7. Agent's Mailing Address:**	41 Hutchins Dr., Portland, ME
3. Applicant's Daytime Phone #:	207-780-4585	**8. Agent's Daytime Phone # :**	(207) 558-3662
4. Applicant's Fax # (if available):		**9. Agent's Fax # (if available):**	
5. Applicant's *e-mail address* (REQUIRED -license will be sent via: e-mail):	john.souther@maine.edu	**10. Agent's *e-mail address* (REQUIRED - license will be sent via e-mail):**	dstairs@woodardcurran.com

PROJECT INFORMATION

11. Name of Development:	USM Campus and Student Success Center and Residence Hall						
12. Map and Lot #'s:	**Map #:**	**Lot #:**	**13. Deed Reference #'s:**		**Book #:** 15109	**Page #:** 33	
14. Location of Project City/Town:	Portland	**15. County:**	Cumberland	**16. UTM Northing**	4835207.	**17. UTM Easting**	70.27361111
18. Brief Description of Project including total parcel size:	Amendment to existing SLOD for redevelopment of 3.8 acres with a new Career and Student Success Center and Residence Hall on campus.						

19. Type of Direct Watershed: (Check all that apply)

☐ Lake not most at risk ☐ River, stream or brook ☐ Coastal wetland
☐ Lake most at risk ☐ Urban impaired stream ☐ Wellhead or public water
☐ Lake most at risk, severely blooming ☐ Freshwater wetland

20. Name of Waterbody Project Site drains to:	Site drains to municipal sewer system; within the Back Cove watershed		
21. Amount of Developed Area:	Total acres: 3.8	Existing Developed area: 3.8 acres	New Developed area: 0 acres (Entire site to be redeveloped)
22. Amount of Impervious Area:	Total acres: 2.5	Existing Impervious areas 0 acres	New Impervious area: 2.5 acres (Net Reduction of 1.16 acres)

23. Development started prior to obtaining a license?:	☐ **Yes** ■ **No**		
24. .Development or any portion of the site subject to enforcement action?	☐ **Yes** ■ **No**	**If yes**, name of enforcement staff involved?	
25. Common scheme of development?:	☐ **Yes** ■ **No**	**26. Title, Right or Interest:**	■ **own** ☐ **lease** ☐ **purchase option** ☐ **written agreement**
27. Natural Resources Protection Act permit required?:	☐ **Yes** ■ **No**	**If yes:** ☐ **PBR** ☐ **Tier 1** ☐ **Tier 2** ☐ **Full Permit**	
28. Existing DEP Permit number (if applicable):	L-20438-22-D-A		
29. Names of DEP staff person(s) present at the pre-application meeting:	NA		
30. Does agent have an interest in project? If yes, what is the interest?	☐ **Yes** ■ **No**		

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following :

CERTIFICATIONS / SIGNATURES

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the electronic address located on the front page of this application (see #5 for the applicant and #10 for the agent)"..

Signed: _____ **Title** Project Manager **Date:** March 5, 2020

Notice of Intent to Comply with Maine Construction General Permit	**With this Site Law application form and my signature, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.** **If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.** **Signed** _____ **Date:** March 5, 2020

NOTE: You must file a MCGP Notice of Termination (Form K) within 20 days of completing permanent stabilization of the project site.

CERTIFICATION

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for development approval is complete and accurate to the best of his/her knowledge.

Signature: _____

Name (print): Darrin Stairs

Date: March 5, 2020

Re/Cert/Lic No.: _____

Engineer PE15118

Geologist _____

Soil Scientist _____

Land Surveyor _____

Site Evaluator _____

Active Member of the Maine Bar _____

Professional Landscape Architect _____

Other _____

Maine's Public Universities
UNIVERSITY OF MAINE SYSTEM

UNIVERSITY OF SOUTHERN MAINE
PORTLAND • GORHAM • LEWISTON • ONLINE

February 27, 2020

To: Local, State, and Federal Review Officials

The University of Southern Maine, a member of the University of Maine System, is preparing plans for the Career and Student Success Center (CSSC) at the University of Southern Maine, Portland, ME. The University has retained Woodard & Curran, Inc. to assist in the preparation of the applications associated with permitting approvals for this project. When necessary, Woodard & Curran, Inc. is authorized as its agent to represent the University in addressing questions on the plans, or applicable applications, for this project.

Sincerely,

John M. Souther,
Executive Director of Facilities Management,
University of Southern Maine for the
University of Maine System

Facilities Management
P.O. Box 9300, Portland, ME 04104-9300
(207) 780-4160, TTY (207) 780-5646, FAX (207) 780-4538
www.usm.maine.edu
A member of the University of Maine System

FORM D

SUBMISSIONS CHECKLIST

If a provision is not applicable, put "NA"

Section 1. Development description

A. Narrative

X 1. Objectives and details

X 2. Existing facilities (with dates of construction)

B. Topographic map

X 1. Location of development boundaries

X 2. Quadrangle name

C. Construction plan

X 1. Outline of construction sequence (major aspects)

2. Dates

D. Drawings

X 1. Development facilities

X a. Location, function and ground area

NA b. Length/cross-sections for roads

X 2. Site work (nature and extent)

X 3. Existing facilities (location, function ground area and floor area)

4. Topography

X a. Pre- and post-development (contours 2 ft or less)

X b. Previous construction, facilities and lot lines

X **Section 2. Title, right or interest** (copy of document)

Section 3. Financial capacity

X A. Estimated costs

B. Financing

X 1. Letter of commitment to fund

2. Self-financing

NA a. Annual report

NA b. Bank statement

3. Other

NA a. Cash equity commitment

NA b. Financial plan

NA c. Letter

NA 4. Affordable housing information

Section 4. Technical ability (description)

X A. Prior experience (statement)

X B. Personnel (documents)

Section 5. Noise

X A. Developments producing a minor noise impact (statement)

NA 1. Residential developments

NA 2. Certain non-residential subdivisions

X 3. Schools and hospitals

NA 4. Other developments

NA a. Type, source and location of noise

NA b. Uses, zoning and plans

NA c. Protected locations

NA d. Minor nature of impact

NA e. Demonstration
NA B. Developments producing a major noise impact (full noise study)
NA 1. Baseline
NA a. Uses, zoning and plans
NA b. Protected locations
NA c. Quiet area
NA 2. Noise generated by the development
NA a. Type, source and location of noise
NA b. Sound levels
NA c. Control measures
NA d. Comparison with regulatory limits
NA e. Comparison with local limits

X **Section 6. Visual quality and scenic character**(narrative, description, visual impact analysis)

X **Section 7. Wildlife and fisheries** (narrative)

NA **Section 8. Historic sites** (narrative)

NA **Section 9. Unusual natural areas** (narrative)

Section 10. Buffers
NA A. Site plan and narrative

Section 11. Soils
X A. Soil survey map and report
X 1. Soil investigation narrative
X 2. Soil survey map
X B. Soil survey intensity level by development type
1. Class A (High Intensity) Soil Survey
2. Class B (High Intensity) Soil Survey
3. Class C (Medium High-Intensity) Soil Survey
4. Class D (Medium Intensity) Soil Survey
C. Geotechnical Investigation
NA D. Hydric soils mapping

Section 12. Stormwater management
A. Narrative
X 1. Development location
NA 2. Surface water on or abutting the site
NA 3. Downstream ponds and lakes
X 4. General topography
X 5. Flooding
NA 6. Alterations to natural drainage ways
X 7. Alterations to land cover
X 8. Modeling assumptions
9. Basic standard
X 10. Flooding standard
X 11. General standard
X 12. Parcel size
13. Developed area
14. Disturbed area
15. Impervious area
B. Maps
X 1. U.S.G.S. map with site boundaries
X 2. S.C.S. soils map with site boundaries
X C. Drainage Plans (a pre-development plan and a post-development plan)

X 1. Contours
X 2. Plan elements
X 3. Land cover types and boundaries
X 4. Soil group boundaries
X 5. Stormwater quantity subwatershed boundaries
X 6. Stormwater quality subwatershed boundaries
X 7. Watershed analysis points
X 8. Hydrologic flow lines (w/flow types and flow lengths labeled)
X 9. Runoff storage areas
X 10. Roads and drives
X 11. Buildings, parking lots, and other facilities
X 12. Drainage system layout for storm drains, catch basins, and culverts
NA 13. Natural and man-made open drainage channels
NA 14. Wetlands
NA 15. Flooded areas
X 16. Benchmark
X 17. Stormwater detention, retention, and infiltration facilities
X 18. Stormwater treatment facilities
NA 19. Drainage easements
X 20. Identify reaches, ponds, and subwatersheds matching stormwater model
NA 21. Buffers

X D. Runoff analysis (pre-development and post development)
X 1. Curve number computations
X 2. Time of concentration calculations
X 3. Travel time calculations
X 4. Peak discharge calculations
X 5. Reservoir routing calculations

X E. Flooding Standard
X 1. Variance submissions (if applicable)
X a. Submissions for discharge to the ocean, great pond, or major river
X i. Map
X ii. Drainage plan
X iii. Drainage system design
NA iv. Outfall design
NA v. Easements
NA b. Insignificant increase
NA i. Downstream impacts

X c. Submissions for discharge to a public stormwater system
X i. Letter of permission
X ii. Proof of capacity
NA ii. Outfall analysis and design (pictures)
X 2. Sizing of storm drains and culverts
X 3. Stormwater ponds and basins
X a. Impoundment sizing calculations
X b. Inlet calculations
X c. Outlet calculations
NA d. Emergency spillway calculations
X e. Subsurface investigation report
NA f. Embankment specifications
NA g. Embankment seepage controls
NA h. Outlet seepage controls
X i. Detail sheet
j. Basin cross sections
X k. Basin plan sheet
NA 4. Infiltration systems
NA a. Well locations map
NA b. Sand and gravel aquifer map
NA c. Subsurface investigation report with test pit or boring logs

NA d. Permeability analysis
NA e. Infiltration structure design
NA f. Pollutant generation and transport analysis
NA g. Monitoring and operations plan
NA i. Locations of storage points of potential contaminants
NA ii. Locations of observation wells and infiltration monitoring plan
NA iii. Groundwater quality monitoring plan
NA 5. Drainage easement declarations.
X F. Stormwater quality treatment plan peak discharge calculations
X 1. Basic stabilization plan
NA a. Ditches, swales, and other open channel stabilization
NA b. Culvert and storm-drain outfall stabilization
NA c. Earthen slope and embankment stabilization
X d. Disturbed area stabilization
NA e. Gravel roads and drives stabilization

X 2. General Standard
X a. Calculations for sizing BMP
X b. Impervious area calculation
X c. Developed area calculation
X d. Summary spreadsheet of calculations

NA 3. Phosphorus control plan
NA a. Calculations for the site's allowable phosphorus export
NA b. Calculations for determining the developed site's phosphorus export
NA c. Calculations for determining any phosphorus compensation fees
NA 4. Offset Credits
NA a. Urban impaired stream
NA Offset credit calculation
NA b. Phosphorus credit determination
NA i. Location map
NA ii. Scaled plan
NA iii. Title and right
NA iv. Demolition plan
NA v. Vegetation plan
NA vi. Offset credit calculation
NA vii. Calculation for the new allowable export
NA 5. Runoff treatment measures
NA a. structural measures
NA i. Design drawings and specifications
NA ii. Design calculations
NA iii. Maintenance plan
NA iv. TSS removal or phosphorus treatment factor determinations
NA v. Stabilization plan
NA b. Vegetated buffers
NA i. Soil survey
NA ii. Buffer plan
NA iii. Turnout and level spreader designs
NA iv. Deed restrictions
NA 6. Control plan for thermal impacts to coldwater fisheries
NA 7. Control plan for other pollutants
X 8. Engineering inspection of stormwater management facilities

X G. Maintenance of common facilities or property
X 1. Components of the maintenance plan
X A. Maintenance of facilities by owner or operator
X 1. Site owner or operator (name legally responsible party)
X 2. Contact person responsible for maintenance
NA 3. Transfer mechanism

X 4. List of facilities to be maintained
X 5. List of inspection and maintenance tasks for each facility
NA 6. Identifications of any deed covenants, easements, or restrictions
___ 7. Sample maintenance log
___ 8. Copies of any third-party maintenance contracts
NA B. Maintenance of facilities by homeowner's association
NA 1. Incorporation documents for the association
NA 2. Membership criteria
NA 3. Association officer responsible for maintenance
NA 4. Establishment of fee assessment for maintenance work
NA 5. Establishment of lien system
NA 6. Reference to department order(s) in association charter
NA 7. Transfer mechanism from developer to association
NA 8. List of facilities to be maintained
NA 9. Identification of any deed covenants, easements, or restrictions
NA 10. Renewal of covenants and leases
NA 11. List of inspection and maintenance tasks for each facility
NA 12. Sample maintenance log
NA 13. Copies of any third-party maintenance contracts
NA C. Maintenance of facilities by municipality or municipal district
NA 1. Identification of the municipal department or utility district
NA 2. Contact person responsible for maintenance
NA 3. Evidence of acceptance of maintenance responsibility
NA 4. Transfer mechanism from developer
NA 5. List of facilities to be maintained
NA 6. List of inspection and maintenance tasks for each facility
NA 7. Identifications of any deed covenants, easements, or restrictions
NA 8. Sample maintenance log
X 2. General inspection and maintenance requirements
NA a. Drainage easements
X b. Ditches, culverts, and catch-basin systems
X c. Roadways and parking surfaces
X d. Stormwater detention and retention facilities
NA 1. Embankment inspection and maintenance
NA 2. Outlet inspection and clean-out
NA 3. Spillway maintenance
X 4. Sediment removal and disposal
NA e. Stormwater infiltration facilities
NA 1. Sediment protection plan
NA 2. Infiltration rehabilitation plan
NA 3. Sediment removal and disposal
NA 4. Groundwater monitoring plan
NA f. Proprietary treatment devices
NA g. Buffers
NA h. Other practices and measures

Section 13. Urban Impaired Stream Submissions

NA 1. Off-site credits
NA 2. Compensation fees (Urban Impaired Stream/Phosphorus)
NA 3. Development impacts

Section 14. Basic Standards

X A. Narrative
X 1. Soil types
NA 2. Existing erosion problems
NA 3. Critical areas
NA 4. Protected natural resources
X 5. Erosion control measures

X 6. Site stabilization
X B. Implementation schedule
X C. Erosion and sediment control plan
X 1. Pre-development and post-development contours
X 2. Plan scale and elements
X 3. Land cover types and boundaries
NA 4. Existing erosion problems
NA 5. Critical areas
X 6. Protected natural resources
X 7. Locations (general)
X 8. Locations of controls
X 9. Disturbed areas
10. Stabilized construction entrance
X D. Details and specifications (for both temporary and permanent measures)
NA E. Design calculations
X F. Stabilization plan
X 1. Temporary seeding
X 2. Permanent seeding
X 3. Sodding
X 4. Temporary mulching
X 5. Permanent mulching
X G. Winter construction plan
X 1. Dormant seeding
X 2. Winter mulching
NA H. Third-party inspections
NA 1. Inspector's name, address, and telephone number
NA 2. Inspector's qualifications
NA 3. Inspection schedule
NA 4. Contractor contact
NA 5. Reporting protocol

Section 15. Groundwater

NA A. Narrative
NA 1. Location and maps
NA 2. Quantity
NA 3. Sources
NA 4. Measures to prevent degradation
NA B. Groundwater protection plan
NA C. Monitoring plan
NA 1. Monitoring points
NA 2. Monitoring frequency
NA 3. Background conditions
NA 4. Monitoring parameters
NA 5. Personnel qualifications
NA 6. Proof of training
NA 7. Equipment and methods
NA 8. Quality assurance/quality control
NA 9. Reporting requirements
NA 10. Remedial action plan
NA D. Monitoring well installation report
NA 1. Well location map
NA 2. Elevation data
NA 3. Well installation data
NA 4. Well construction details
NA 5. Borehole logs
NA 6. Summary of depth measurements
NA 7. Characteristics of subsurface strata
NA 8. Well installation contract

NA 9. Schematic cross-sections
NA 10. Monitoring point summary table
NA 11. Protective casing
NA 12. On-site well identification

Section 16. Water supply

X A. Water supply method
NA 1. Individual wells (evidence of sufficient/healthful supply)
NA a. Support of findings by well drillers
NA b. Support of findings by geologist
NA 2. Common well(s) (reports)
NA a. Hydrogeology report
NA b. Engineering report
NA c. Well installation report
NA d. Long-term safe yield and zone of influence determination
NA e. Public water supply
NA i. Proposed well or wells
NA ii. Existing well or wells
NA iii. Water quality analysis
NA 3. Well construction in shallow-to-bedrock areas
NA 4. Additional information
X 5. Off-site utility company or public agency
NA 6. Other sources
NA B. Subsurface wastewater disposal systems (locations of systems and wells)
X C. Total usage (statement re: total anticipated water usage)

Section 17. Wastewater disposal

NA A. On-site subsurface wastewater disposal systems (investigation results)
NA 1. Site plan
2. Soil conditions summary table
NA 3. Logs of subsurface explorations
4. Additional test pits, borings or probes
NA a. Soil conditions A
NA b. Soils with Profiles 8 and 9 parent material
NA c. Soil conditions D
NA d. Disposal field length 60 feet or greater
NA 5. 3-bedroom design
NA 6. Larger disposal systems
a. System design details
NA b. Plan view
NA c. Cross sections
NA d. Test pit data
NA e. Mounding analysis
NA B. Nitrate-nitrogen impact assessment
NA 1. When required
NA a. Exempted NA
i. Conventional systems meeting certain setbacks
NA ii. Denitrification systems
NA b. Special conditions and other exemptions
NA 2. Assumptions
NA a. Initial concentration
NA b. Background concentration
NA c. Contribution from development
NA d. Mixing and dilution
NA e. Severe-drought scenario
NA f. Wastewater flow to subsurface wastewater disposal fields

NA 3. Assessment report minimum requirements
NA a. Narrative and calculations
NA b. Site plan
NA i. Well locations
NA ii. 10 mg/l and 8 mg/l isocons
NA iii. Groundwater contours and groundwater flow divides
NA c. References
NA 4. Denitrification systems
NA a. Design plans and specifications
NA b. Installation information
NA c. Monitoring plan
NA d. Maintenance
NA e. Backup system
X D. Municipal facility or utility company letter
NA E. Storage or treatment lagoons

X **Section 18. Solid waste** (list: type, quantity, method of collection and location)
X A. Commercial solid waste facility (final disposal location)
X B. Off-site disposal of construction/demolition debris (final disposal location)
C. On-site disposal of woodwaste/land clearing debris
NA 1. Applicability of rules (evidence re: applicability of rules)
2. Burning of wood wastes
NA a. Delineation on site plan
NA b. Plans for handling unburned woodwaste and woodash
NA c. Evidence of capacity to accept waste (approved facility)
NA d. Usage of materials
NA e. Data on mixing ratios and application rates
X D. Special or Hazardous Waste

Section 19. Flooding
NA A. Explanation of flooding impact
NA B. Site plan showing 100-year flood elevation
NA C. Hydrology analysis
X D. FEMA flood zone map with site boundaries

Section 20. Blasting
NA A. Site Plan or map
NA B. Report
1. Assessment
2. Blasting plan

Section 21. Air emissions (narrative and summary)
NA A. Point and non-point sources identified
NA B. Emission components (point sources)

Section 22. Odors
NA A. Identification of nature/source
NA B. Estimate of areas affected
NA C. Methods of control)

NA **Section 23. Water vapor** (narrative)

X **Section 24. Sunlight** (statement and drawing, if required)

Section 25. Notices
NA A. Evidence that notice sent
NA B. List of abutters for purposes of notice

Supplemental requirements for Wind Energy Developments only:

Section 26. Shadow flicker

NA A. A copy of the Windpro Analysis and associated narrative

Section 27. Public Safety

NA A. Design safety certifications or other documents attesting to the safety of the wind turbine equipment.
NA B. Evidence pertaining to overspeed controls
NA C. Site plan documenting safety setbacks zones for each wind turbine
NA D. Other documents as necessary to demonstrate safety considerations

Section 28. Tangible Benefits

NA A. Narrative demonstration of tangible benefits

Section 29. Decommissioning

NA A. Description of implementation trigger for decommissioning
NA B. Description of extent of decommissioning
NA C. Itemization of total cost to complete decommissioning
NA D. Demonstration of financial assurance for completeness of decommissioning plan

Section 30. Generating Facility-visual Quality and Scenic Character

NA A. (narrative, description, visual impact analysis)

USM Career and Student Success Center and Residence Hall

Site Location of Development

41 Hutchins Drive
Portland, ME 04102
800-426-4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0232656.00
University of Southern Maine
March 2020

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1. DEVELOPMENT DESCRIPTION

This narrative report is in support of a Site Location of Development (SLOD) Permit Amendment for the proposed USM Career and Student Success Center ("CSSC") and Residence Hall to be located at 23-29 Bedford Street in Portland, Maine. A letter authorizing Woodard & Curran to act at the agent on behalf of the Applicant is attached to this application.

1.1 OBJECTIVES & DETAILS

The University of Southern Maine comprises three campus locations in central and southern Maine, a region that is viewed nationally as among the most livable and desirable in the country. The three campuses, located in Portland, Gorham, and Lewiston, have different physical features and dynamics, and each offers a variety of educational, cultural, and recreational opportunities to USM students. This project represents a significant implementation of the USM Facilities Master Plan. In addition to the approximately 60,000 SF Student Success Center and the 580-bed Residence Hall (approximately 220,000 SF) the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services; site lighting; and other site amenities. The proposed work is shown on the drawings and renderings included with this application and is detailed below.

The proposed CSSC and Residence Hall project is located on the Portland Campus of USM, at approximately the corner of Bedford Street and Durham Street in Portland, Maine (Site). The attached Location Map and Tax Maps show the project location. The project is located within two underlying City Zones. Most of the project is in the R-5 Residential Zone, with a small portion on the eastern side in B-2 Community Business Zone. The entirety of the project is in the USM Overlay Zone. The purpose of the USM Overlay zone is to allow the University to continue and reasonably expand within defined boundaries, and to recognize the unique qualities of a university campus while at the same time protecting the value and integrity of established neighborhoods. This project is in alignment with that purpose. University buildings and structures are subject to the requirements of the underlying zoning districts, except as modified by the USM Overlay Zone.

The site is currently developed with the Facilities Building, the Woodbury Student Center, and several paved parking lots. The proposed project includes redevelopment of the site for a new Career and Student Success Center, Residence Hall, and Campus Quad. The project will also include reconstruction of the sidewalks along the project's frontages, and the addition of street trees and streetlights.

In addition to the SLOD permit, the proposed work requires the following permits:

- City of Portland Level III Site Plan;
- Maine Construction General Permit Notice of Intent; and
- FAA Notice of Proposed Construction.

1.2 EXISTING FACILITIES

The Existing Conditions Plan, included in the drawings submitted with this application, depicts the existing conditions of the project area, based on a ground-level survey and site observations completed by SurveyWorks, Inc in February 2020. The Site is currently fully developed with buildings and surface parking lots. There are no significant natural features or wetlands due to the intense level of existing development. Topography slopes generally from west to east towards the intersection of Bedford and Durham Streets, from approximate elevation 50' down to 23'.

1.3 TOPOGRAPHIC MAP

A USGS topographic map showing the approximate location of proposed project is attached to this Section for your reference. Topography slopes generally from west to east towards the intersection of Bedford and Durham Streets, from approximate elevation 50' down to 23'.

1.4 CONSTRUCTION PLAN

Construction is anticipated to begin in August of 2020. Erosion and sediment control measures will be installed prior to any ground disturbing activities, as described in Section 14 of this Report. A Construction Management Plan has been submitted to the City as part of the Site Plan Application review process.

The Site will be managed during construction to minimize impacts to the adjacent land uses. Maintaining access to adjacent properties and public facilities will be a priority. Traffic impacts to adjacent roadways, including Bedford, Durham and Falmouth Streets, will be minimized during construction to the greatest extent possible. Traffic controls will consist of temporary signage and barriers where necessary to manage vehicle, pedestrian, and bicycle traffic and direct it safely around the construction area. Street opening permits will be required for utility connections. Additionally, stormwater will be discharged through an outfall to Fore River.

Below is the anticipated sequence of construction activities for major aspects of the development:

- Installation of erosion and sediment control measures and traffic control measures;
- Demolition and site preparation activities;
- Construction of utilities, stormwater management system;
- Construction of the buildings;
- Installation of landscaping and final surface materials; and
- Removal of erosion and sediment control measures.

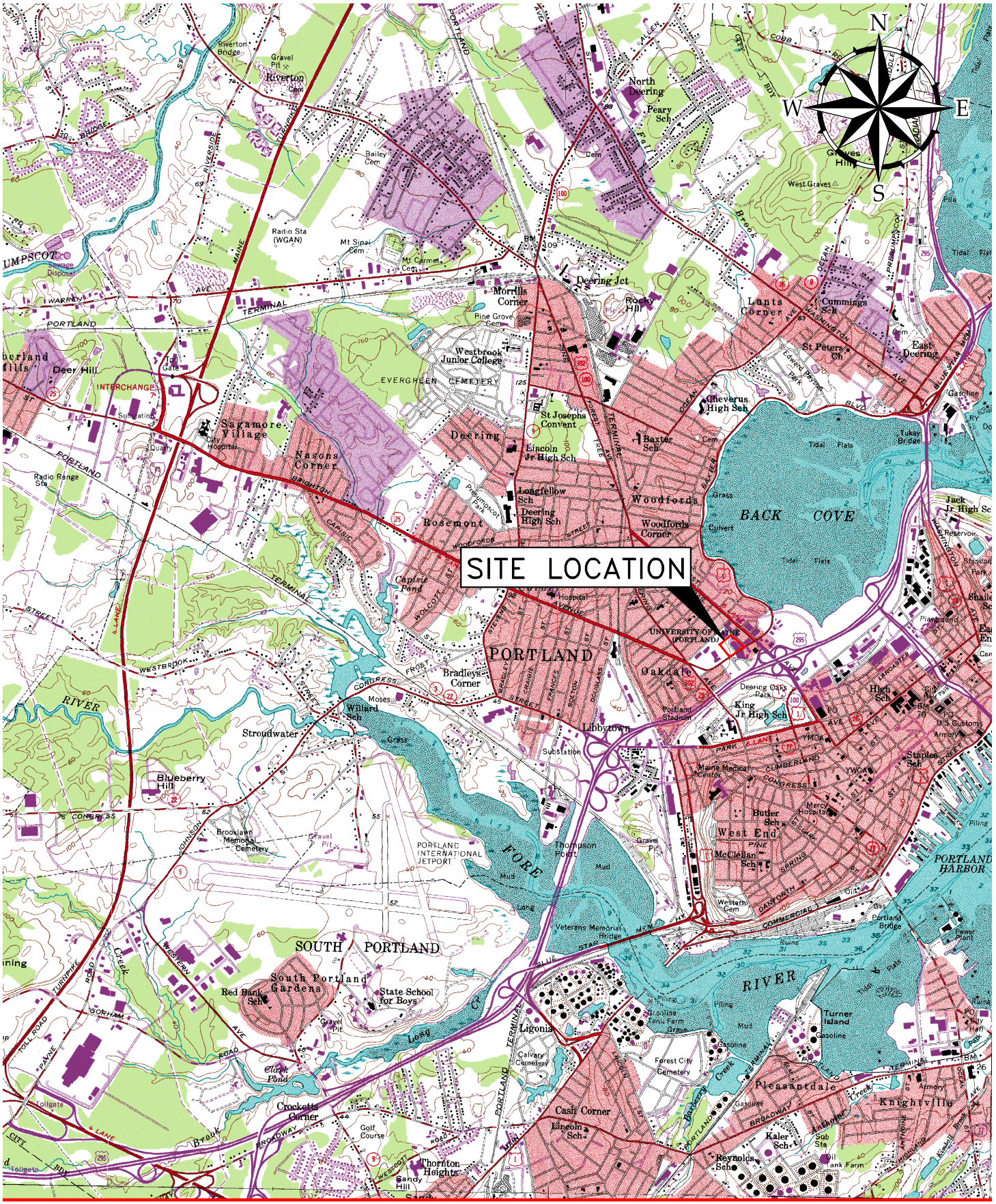
1.5 DRAWINGS

Design drawings showing the proposed development are attached to this Section.

1.6 LIST OF ATTACHMENTS

The following documents are attached to this Section:

- Topographic Map; and
- Design Drawings (Bound Separately).



WOODARD & CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

LOCATION MAP

DESIGNED BY: DS	CHECKED BY: DS
DRAWN BY: DS	0232656.00 LOCATION MAP*.dwg

UNIVERSITY OF SOUTHERN MAINE
PO BOX 9300
PORTLAND, ME

CAMPUS STUDENT SUCCESS CENTER
& STUDENT RESIDENTIAL
PORTLAND, MAINE

JOB NO: 0232656.00
DATE: March 2020
SCALE: 1" = 1000'

Location Map

2. TITLE, RIGHT, OR INTEREST

The proposed development is located on properties owned by the Applicant and identified as Tax Map 114, Lots G-6 thru G-10; and Map 114A, lots H-5 thru H-15. Attached are copies of the deeds associated with these properties.

2.1 LIST OF ATTACHMENTS

- Deed, dated August 28, 1957, Cumberland County Registry of Deeds, Book 2370, Pg 135.
- Deed, dated December 24, 1964, Cumberland County Registry of Deeds, Book 2873, Pg 133.
- Deed, dated March 28, 1970, Cumberland County Registry of Deeds, Book 3121, Pg 878.
- Deed, dated October 14, 1999, Cumberland County Registry of Deeds, Book 15109, Pg 33.

378

4111 (90)

Know all Men by these Presents,

That FOREST CITY CHEVROLET ~~COMPANY~~ Company

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of One Dollar ($1.00) and other valuable considerations,

paid by UNIVERSITY OF MAINE, a body politic and corporate, organized under the laws of the State of Maine,

the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said University of Maine, its successors

~~heirs~~ and assigns forever,

a certain lot or parcel of land together with any improvements thereon situated on the northwesterly side of Bedford Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the northwesterly side of Bedford Street with the southwesterly side of Heywood Street; thence southwesterly by Bedford Street two hundred forty-three (243) feet, more or less, to land of University of Maine, being the land conveyed by Edward D. Noyes to Portland Junior College by deed dated December 31, 1956 and recorded in the Cumberland County Registry of Deeds, Book 2332, Page 151; thence northwesterly by said land of University of Maine two hundred forty-five (245) feet, more or less, to other land of University of Maine, being the land conveyed by Edward D. Noyes to Portland University Extension Courses, Inc. by deed dated July 1, 1948 and recorded in said Registry of Deeds, Book 1916, Page 364; thence northeasterly by said other land of University of Maine one hundred sixty-three (163) feet, more or less, to land of University of Maine, being the same land conveyed by Edward D. Noyes to it by deed dated April 9, 1958 and recorded in said Registry of Deeds, Book 2404, Page 15; thence southeasterly by said land and by an extension southeasterly of the line of said land which is the southwesterly side of Heywood Street three hundred (300) feet, more or less, to Bedford Street and the point of beginning.

Being the same premises conveyed to Forest City Motor Co. by deed of Beatrice M. Noyes and by deed of Canal National Bank, et al, as Trustees under the Will of Edward Deering Noyes, Jr. both deeds dated May 18, 1964, recorded in Cumberland County Registry of Deeds, Book 2821, Pages 354 and 346 respectively. The grantor herein is the successor in interest to said Forest City Motor Co. by change of corporate name duly recorded in said Registry of Deeds.

To have and to hold, the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said University of Maine, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee, its/ successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;

that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Forest City Chevrolet ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Philip Gemmer, its President ~~Treasurer~~, thereunto duly authorized, this 28 TH day of MARCH in the year one thousand nine hundred and seventy.

Signed, Sealed and Delivered in presence of

Helen A. Pinder

Forest City Chevrolet

~~Company~~

By Philip Gemmer

President ~~Treasurer~~

(CORPORATE SEAL)

FOREST CITY CHEVROLET INC. 1970

State of Maine

County of Cumberland **ss.** 19 70

Then personally appeared the above named

Philip Gemmer, President ~~Treasurer~~ **of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act**

(90) 135

Know all Men by these Presents,

That Portland Junior College ~~Company~~,

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of one dollar and other valuable considerations

paid by University of Maine, a corporation organized and existing under the laws of the State of Maine and located at Orono in the County of Penobscot and State of Maine

the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said University of Maine its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land with the buildings thereon situated in Portland aforesaid bounded and described as follows:

Beginning at a pipe set in the ground at the corner formed by the intersection of the easterly side of Brighton Avenue and the southerly side of Falmouth Street; thence by said southerly side of Falmouth Street in an easterly direction nine hundred eighty-two and sixty-seven hundredths (982.67) feet to a pipe set in the ground on said southerly side of Falmouth Street; thence southerly with an included angle of ninety-four degrees thirty-eight minutes (94° 38') three hundred fifty-two and eighty-nine hundredths (352.89) feet to a pipe; thence westerly on a line parallel with Falmouth Street and at an included angle of eighty-five degrees twenty-two minutes (85° 22') one hundred sixty-four and sixty-five hundredths (164.65) feet to a point, said point being on the line of a row of trees running approximately north and south; thence southwardly along the line of said row of trees two hundred forty-five (245) feet more or less to the northerly side of Bedford Street; thence westerly along the northerly side of said Bedford Street six hundred (600) feet more or less to the easterly side of Brighton Avenue; thence along the easterly side of Brighton Avenue four hundred eighty-seven and thirty-eight hundredths (487.38) feet more or less to the point of beginning.

Reference is made to three deeds to Portland University Extension Courses, Inc., the name of which, subsequently, by act of the Legislature has been changed to Portland Junior College, and a fourth deed to Portland Junior College, all from Edward Deering Noyes dated and recorded as follows: December 28, 1946, Book 1854 Page 424, June 30, 1947, Book 1875 Page 227, July 1, 1948, Book 1916 Page 364, and December 31, 1956, Book 2332 Page 151.

Portland Junior College to University of Maine -- War

135

To have and to hold, the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said

University of Maine, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee , its successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;
that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that if and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee , its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Portland Junior College ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Philip I. Milliken , its Treasurer, thereunto duly authorized, this 28th day of August in the year one thousand nine hundred and fifty-seven.

Signed, Sealed and Delivered
in presence of

Jane C. Magnusson

Countersigned
Raymond S. Rracy
President

~~Company~~.
PORTLAND JUNIOR COLLEGE
By Philip I Milliken
Treasurer.

(CORPORATE SEAL)

State of Maine

County of Cumberland ss. August 28, 1957

Then personally appeared the above named Philip I. Milliken Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me,

Jane C. Magnusson Justice of the Peace.
~~Notary Public~~

AUG 28 1957
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 12 H 27 M P.M., and recorded in
BOOK 2370 PAGE 135 Register

Vogel

to

University of Maine

-

War

Know all Men by these Presents, That

I, BEATRICE N. VOGEL, of Falmouth, County of Cumberland and State of Maine, formerly known as Beatrice M. Noyes,

in consideration of one dollar and other valuable consideration s paid by UNIVERSITY OF MAINE, an educational corporation organized and existing under the laws of the State of Maine,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said University of Maine, its successors and assigns forever, a one-third (1/3) interest in common and undivided in and to a certain lot or parcel of land situated on the southwesterly side of Durham Street, City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the southwesterly side of Durham Street at the most northerly corner of land now or formerly of Allan G. Ballard, et al, which corner is situated one hundred eighty-two and eleven hundredths (182.11) feet, northwesterly of Bedford Street as measured along said southwesterly side of Durham Street; thence southwesterly by land of said Ballard and by land of International Harvester Co. a distance of one hundred (100) feet, more or less, to other land of said International Harvester Co.; thence northwesterly by said other land of international Harvester Co. a distance of one hundred twelve (112) feet, more or less, to land now of the University of Maine; thence northeasterly by land of the University of Maine one hundred (100) feet, more or less, to Durham Street; thence southeasterly by Durham Street a distance of one hundred twelve (112) feet, more or less, to the point of beginning.

Being a portion of the premises conveyed by James D. Fessenden, et al, to Nathaniel Deering, et als, dated January 21, 1879, recorded in the Cumberland County Registry of Deeds, Book 455, Page 49.

This conveyance is made subject to and with the benefit of a lease of the above described premises from Edward Deering Noyes, Jr., as Lessor to International Harvester Co. as Lessee dated September 9, 1947.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said University of Maine, its successors and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances except as aforesaid, that I ha ve good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, I, Beatrice N. Vogel, and I, Leo G. Vogel, husband of the said Beatrice N. Vogel,

joining in this deed as Grantor, and relinquishing and conveying my rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 24th day of December in the year of our Lord one thousand nine hundred and sixty-four

Signed, Sealed and Delivered in presence of

Robert B Long
Robert B Long

Beatrice N Vogel
Leo G Vogel

State of Maine, CUMBERLAND ss. December 24, 1964.

Personally appeared the above named Beatrice N. Vogel

and acknowledged the foregoing instrument to be her free act and deed.

Before me, H. Dawson Osgood
NOTARY PUBLIC.
MY COMMISSION EXPIRES SEPTEMBER 6, 1968

STATE OF MAINE, CUMBERLAND COUNTY, SS. *REGISTRY OF DEEDS*

Received DEC 30 1964 *at* 3 o'clock 30 *m.* *M., and recorded in BOOK* 2873 *PAGE* 133 *Attest:* Edward P. Thyson *Register.*

0075689 BK15109PG033

WARRANTY DEED
Maine Statutory Short Form

Know all Men by these presents,

That **Gary T. Gervais**, of Portland, Cumberland County, Maine, for consideration paid, grants to **University of Maine System**, a body politic and corporate, organized and existing under the laws of the State of Maine, with a mailing address of 107 Main Avenue, Bangor, Maine 04401, with Warranty Covenants, a certain lot or parcel of land, together with the buildings thereon, situated in Portland, Cumberland County, Maine, and situated at the northwesterly corner of Bedford Street and Durham Street and bounded and described as follows:

Beginning at the intersection formed by the northerly side of Bedford Street and the westerly side of Durham Street; thence southwesterly and along the northerly line of Bedford Street 68.93 feet to an iron pipe; thence northwesterly and parallel to the westerly line of Durham Street 163.20 feet to an iron pipe; thence northeasterly and at right angles to the last course 66.33 feet to an iron pipe in the westerly line of Durham Street; thence southeasterly and along the westerly line of Durham Street 182.11 feet to the point of beginning.

Being the same premises described in a deed from Mildred L. Cohen to Robert R. Gervais, Jr., and Gary T. Gervais, dated July 25, 1980, recorded in Cumberland County Registry of Deeds, Book 4637, Page 155, and from Robert R. Gervais, Jr., to Gary T. Gervais dated March 29, 1985, recorded in said Registry, Book 6719, Page 321.

This conveyance is made subject to a lease, as may be amended, between Gary T. Gervais and University of Maine System, dated November 8, 1989, as evidenced by a Memorandum of Lease dated February 28, 1990, recorded in Cumberland County Registry of Deeds, Book 9102, Page 319. Said lease is hereby terminated.

Also hereby conveying all rights, easements, privileges, and appurtenances belonging to the premises hereinabove described.

Witness my hand this 14th day of October 1999.

Signed and Delivered in
the presence of:

Gary T. Gervais

MAINE REAL ESTATE TAX PAID

BK 15109PG034

STATE OF MAINE
CUMBERLAND, SS.

October 14, 1999

Then personally appeared the above named Gary T. Gervais and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Thomas S Leahy

~~Notary Public~~/Attorney at Law

Printed Name: Thomas S. Leahy

KJT\TGL\GERVAIS\Warranty Deed.doc

RECEIVED
RECORDED REGISTRY OF DEEDS
1999 OCT 15 AM 10:44
CUMBERLAND COUNTY
John B O'Brien

3. FINANCIAL CAPACITY

3.1 ESTIMATED COSTS

The construction budget for the proposed development is approximately $96M for the Career and Success Student Center and the Residence Hall.

3.2 FINANCING

A copy of a letter verifying the Applicant's financial capacity to undertake the project is attached to this Section.

3.3 LIST OF ATTACHMENTS

- Financial Capacity Letter

UNIVERSITY OF
SOUTHERN MAINE
Finance and Administration

March 5, 2020

Mr. Darrin Stairs
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

Dear Mr. Stairs:

The University of Southern Maine expects the Career and Student Success Center (CSSC) and residence hall projects to cost approximately $96 million combined.

To fund the project, the University would utilize the following resources:

(1) For the CSSC project ($31 million), USM has at its disposal $19 million in voter-approved general obligation debt and $1 million in philanthropic contributions.

(2) For the remaining $11 million in funding required for the CSSC, as well as the $65 million total cost of the residence hall, the University of Maine System would issue revenue bonds.

Thank you for your consideration.

Sincerely,

Alexander E. Porteous
Chief Business Officer

P.O. Box 9300, Portland, ME 04104-9300
(207) 780-4484 TTY (207) 780-5646, FAX (207) 780-4549
www.usm.maine.edu
A member of the University of Maine System

4. TECHNICAL ABILITY

The University of Southern Maine (USM) is a public university with over 8,000 undergraduate and graduate students taking courses online and at campuses in Portland, Gorham and Lewiston. Known for its academic excellence, student focus and engagement with the community, USM provides students with hands-on experience that complements classroom learning and leads to employment opportunities in one of the nation's most desirable places to live. USM is a member of the University of Maine System (UMS), the State's largest educational enterprise that includes seven universities and an annual enrollment of nearly 30,000 students.

Capstone Development Partners (CDP) is a student housing real estate development company exclusively focused on working with colleges and universities in public private partnerships. The Principals of CDP have a combined experience of more than 40 years helping colleges and universities overcome real estate development and housing challenges. Their mission is unique to the student housing industry in that they focus on projects where they are in partnership with the university— rather than simply building apartments in a community with little regard for its plans, its institutional objectives or its long and short-term goals. They have built a reputation on collaborating with schools and respecting and burnishing the unique campus culture of its partners. They work hard every day to establish creative solutions that align the interests of the municipal, private and university project stakeholders, inclusive of housing and student life professionals, finance executives, presidents, facilities personnel, and the many others involved in development on or near a college campus.

Woodard & Curran (W&C), a 1,000-person Portland-based firm, has provided engineering services to the public and private sector for over 40 years, including permitting, civil/site engineering, stormwater and construction management services. W&C has completed projects for colleges, universities, and healthcare institutions that build strong, sustainable infrastructure and environmental programs serving both their business needs and the communities that make them so vibrant. With extensive experience in design and permitting for site development projects, W&C has completed many projects within the City of Portland and for the University of Maine System.

SMRT is a full-service firm of architects, engineers, planners and professionals committed to solving problems through design. Based in Portland, Maine, SMRT specializes in creating complex, 24-7 facilities for clients with challenges in education, healthcare, science/technology/industry, justice, government and workplace environments. Through collaboration, the project focus is to deliver buildings that further owner's business objectives through strong design, sustainable infrastructure and high functionality. SMRT has broad experience with projects for higher education including multiple projects for the University of Maine.

Elkus Manfredi Architects (EMA) is a full-service design firm providing architecture, master planning, urban design, interior architecture, historic preservation, space planning, programming, and experiential graphic design. EMA's portfolio of work includes a diversity of projects, including community-building higher education campus plans and facilities that create places for living, learning and innovating. The firm is at the forefront of sustainable design, with 8 of its 60 LEED projects at the Platinum-certified level. Elkus Manfredi has also signed on to the AIA's 2030 Commitment and has a rigorous process of early performance modeling to optimize design.

PC Construction (PCC) shares over half a century of industry-leading excellence with every client we meet. They offer general contracting, construction management, and design-build services to private and public companies for projects of all sizes — from a single office fit-up to water supply programs valued at over $300 million. With headquarters in Vermont and a network of locations in Georgia, Maine, New Hampshire, New York and North Carolina, PCC manage project offices up and down the east coast and boast an annual volume average of $500 million.

Copies of resumes and project references can be provided upon request.

5. NOISE

The proposed buildings will have a combination of roof-mounted and interior-located mechanical equipment for heating, ventilation, and air conditioning (HVAC). Two new generators with sound attenuating enclosures will be located in the service area near the existing generator, which is to remain. Noise levels at present are minimal and are not known to have created an unreasonably adverse impact on the surrounding campus and industrial (Oakhurst) areas. Proposed noise levels are anticipated to be similar. The generators will be exercised weekly and not run continuously unless there is a power outage. Note that the generators are located within the service core and flanked by existing and proposed buildings, providing partial shielding of the sound. Cut sheets for the proposed generators and enclosures are attached

5.1 LIST OF ATTACHMENTS

- Generator and Sound Enclosure Cut sheets



Image shown may not reflect actual configuration

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

Specifications

Generator Set Specifications	
Rating	80 ekW (100 kVA)
Voltage	480 Volts
Frequency	60 Hz
Speed	1800 rpm

Generator Set Configurations	
Emissions/Fuel Strategy	U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)

Engine Specifications		
Engine Model	C4.4 Vertical In-line 4, 4-cycle diesel	
Bore	105.0 mm	4.13 in
Displacement	4.4 L	268.5 in³
Stroke	127.0 mm	5.0 in
Compression Ratio	16.7:1	
Aspiration	Turbocharged Air-to-Air-Aftercooled	
Governor Type	Electronic	
Fuel System	Common Rail	

Package Dimensions*		
Length	2362 mm	93 in
Width	1110 mm	44 in
Height	1304 mm	51 in
Weight†	1130 kg	2491 lb

*Note: For reference only – do not use for installation design. Please contact your local dealer for exact weight and dimensions.

†Weight includes: Oversize generator, skid base, circuit breaker, oil, and coolant.

Benefits & Features

Cat® Diesel Engine

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine control

Generator

- Matched to the performance and output characteristics of Cat engines
- Industry-leading mechanical and electrical design
- Industry-leading motor starting capabilities
- High efficiency

Cat EMCP Control Panel

The EMCP controller features the reliability and durability you have come to expect from your Cat equipment. EMCP 4 is a scalable control platform designed to ensure reliable generator set operation, providing extensive information about power output and engine operation. EMCP 4 systems can be further customized to meet your needs through programming and expansion modules.

Seismic Certification

- Seismic certification available.
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength.
- IBC certification requires that the anchoring system used is reviewed and approved by a professional engineer.
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007, CBC 2010.

Design Criteria

- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.
- Cooling system designed to operate in 50˚C/122˚F ambient temperatures with an air flow restriction of 0.5 in. water.

UL 2200/CSA – Optional

- UL 2200 Listed
- CSA Certified

Certain restrictions may apply. Consult with your Cat dealer.

Single-Source Supplier

Fully prototype tested with certified torsional vibration analysis.

Worldwide Product Support

Cat dealers provide extensive post-sale support including maintenance and repair agreements. Cat dealers have over 1,800 dealer branch stores operating in 200 countries. The Cat S•O•S℠ program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products.

Standard Equipment

Air Inlet

- Single element Air filter

Cooling

- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50°C (122°F)

Exhaust

- Exhaust flange outlet

Fuel

- Primary and secondary fuel filters
- Fuel priming pump
- Flexible fuel lines

Generator

- Matched to the performance and output characteristics of Cat engines
- Load adjustment module provides engine relief upon load impact and improves load acceptance and recovery time
- IP23 protection
- Integrated Voltage Regulation

Governor

- Electronic governor – ADEM™ A4

Control Panels

- EMCP 4.2 Series generator set controller

Mounting

- Rubber vibration isolators

Starting/Charging

- 12 volt starting motor
- Battery with rack and cables

General

- Paint – Caterpillar Yellow except rails and radiators gloss black

Optional Equipment

Exhaust

- Industrial, residential, critical mufflers

Generator

- Excitation: [ ] Permanent Magnet Excited (PM) [ ] Internally Excited (IE)
- Anti-condensation heater
- Oversize and premium generators

Starting/Charging

- Battery charger – UL 10 amp
- Battery disconnect switch
- Jacket water heater

General

- UL 2200
- CSA Certification
- Enclosures: sound attenuated, weather protective
- Sub-base dual wall UL Listed fuel tanks
- Automatic transfer switches (ATS)

C4.4
80 ekW/ 100 kVA/ 60 Hz/ 1800 rpm/ 480V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)



Image shown may not reflect actual configuration

D80-8
80 ekW/ 100 kVA
60Hz/ 1800 rpm/ 480V

Package Performance	
Generator Set Power Rating with Fan @ 0.8 Power Factor	80 ekW
Generator Set Power Rating	100 kVA

Fuel Consumption		
100% Load With Fan	23.7 L/hr	6.3 gal/hr
75% Load With Fan	19.0 L/hr	5.0 gal/hr
50% Load With Fan	13.9 L/hr	3.7 gal/hr

Cooling System[1]		
Engine Coolant Capacity	7.0 L	1.8 gal
Radiator Coolant Capacity	10.0 L	2.6 gal
Engine Coolant Capacity with Radiator/Exp Tank	17.0 L	4.5 gal
Air Flow Restriction (System)	0.12 kPa	0.48 in. water

Inlet Air		
Combustion Air Inlet Flow Rate	7.8 m^3/min	275 cfm

Exhaust System		
Exhaust Stack Gas Temperature	630°C	1166°F
Exhaust Gas Flow Rate	17.6 m^3/min	620 cfm
Exhaust System Backpressure (maximum allowable)	15.0 kPa	60.2 in. water
Exhaust Flange Size (internal diameter)	64 mm	2.5 in

C4.4
80 ekW/ 100 kVA/ 60 Hz/ 1800 rpm/ 480V/ 0.8 Power Factor

Rating Type: STANDBY **Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)**

Heat Rejection		
Heat Rejection to Coolant (total)	47.9 kW	2724 Btu/min
Heat Rejection to Exhaust (total)	77.7 kW	4419 Btu/min
Heat Rejection to Atmosphere from Engine	13.5 kW	768 Btu/min
Heat Rejection to Atmosphere from Generator	7.1 kW	404 Btu/min

Alternator[2]		
Motor Starting Capability @ 30% Voltage Dip	215 skVA	
Frame	LC3114D	
Temperature Rise	105°C	189°F
Excitation	Self Excited	

Lube System		
Sump Refill with Filter	8.4 L	2.2 gal

Emissions (Nominal)[3]	
NOx + HC	3.6 g/kW-hr
CO	0.9 g/kW-hr
PM	0.12 g/kW-hr

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to the existing restriction from the factory.

[2] Generator temperature rise is based on a 40°C (104°F) ambient per NEMA MG1-32.

[3] The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% Prime load. This information should not be used for permitting purposes and is subject to change without notice. Contact your Cat dealer for further details.

Rating Type: STANDBY **Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)**

DEFINITIONS AND CONDITIONS

Applicable Codes and Standards:
AS1359, CSA C22.2 No 100-04, UL142, UL489, UL601, UL869, UL2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC,IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, 72/23/EEC, 98/37/EC, 2004/108/EC.

STANDBY: Output available with varying load for the duration of the interruption of the normal source power. Averagepower output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

Fuel Rates are based on fuel oil to specification EPA 2D 89.330-96 with a density of 0.845 – 0.850 kg/L (7.052 – 7.094 lbs/U.S. gal.) @ 15°C (59°F) and fuel inlet temperature 40°C (104°F).

Additional ratings may be available for specific customer requirements, contact your Cat representative for details.

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The International System of Units (SI) is used in this publication.

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Picture shown may not reflect actual configuration

Weather Protective and Sound Attenuated Enclosures

D40 to D60
D80 to D100
D125 to D200

Features

Highly Corrosion Resistant construction
- Stainless steel flush fitting latches and hinges tested and proven to withstand extreme conditions of corrosion
- Zinc plated or stainless steel fastener

Excellent Access
- Single side access for service and controls
- All non-service sides have removable doors and/or panels
- Radiator fill access
- Lube oil and coolant drains piped to the exterior of the enclosure base
- Large cable entry area for installation ease
- Double doors on both sides
- Vertically hinged doors with solid bar door stays to hold doors in place when open

Security and Safety
- Lockable access doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill, and battery can only be reached via lockable access
- Stub-up area is rodent proof

Transportability
- These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites. The sound deadening material is of a self-extinguishing design
- This range of enclosures are designed on modular principles with many interchangeable components permitting on site repair

Options
- Weather Protective - constructed with 16 gauge steel; industrial silencer mounted within the main enclosure body
- Sound Attenuated Level 1 - constructed with 16 gauge steel; weather protective with critical silencer - silencer mounted in separate upward discharging radiator hood
- Sound Attenuated Level 2 - constructed with 16 gauge steel; weather protective with critical silencer and 100% lined with sound deadening material – silencer mounted in separate upward discharging radiator hood
- Sound Attenuated Aluminum constructed with 14 gauge Aluminum 5052 grade. Weather protective with critical silencer and 100% lined with sound deadening material – silencer mounted in separate upward discharging radiator hood
- Caterpillar Yellow* or white paint
- UL Listed sub base tanks
- Externally mounted emergency stop button
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010
- IBC certification for 180 mph wind loading

*Not available with Aluminium enclosures

Enclosure Sound Pressure Levels (SPL) at 100%

Weather Protective Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D40 (2/4)	40	1.7	3602	85
D50 (2/4)	50	1.7	3602	86
D60 (2/4)	60	1.9	4026	88
D80-8	80	3.2	6696	79
D100-8	100	3.6	7564	81
D125-8	125	4.6	9676	78
D150-10	150	4.6	9676	79
D175-4	175	5.9	12431	84
D200-2	200	5.9	12431	89

SA Level 1 Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D40 (2/4)	40	1.7	3602	66
D50 (2/4)	50	1.7	3602	66
D60 (2/4)	60	1.8	3899	71
D80-8	80	3.2	6696	78
D100-8	100	3.2	6696	79
D125-8	125	4.2	8899	74
D150-10	150	4.2	8899	74
D175-4	175	5.6	11830	78
D200-2	200	5.5	11654	81

SA Level 2 Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D80-8	80	3.2	6696	75
D100-8	100	3.2	6696	76
D125-8	125	4.2	8899	74
D150-10	150	4.2	8899	74
D175-4	175	5.2	11018	74
D200-2	200	5.1	10806	75

SA Aluminum Enclosure		Cooling Air Flow Rate		SPL @7m (23ft)
Model	Standby eKW	m^3/s	cfm	dBA
D80-2	80	3.2	6696	73
D100-8	100	3.2	6696	74
D125-8	125	4.2	8899	74
D150-10	150	4.2	8899	75
D175-4	175	5.2	11018	75
D200-2	200	5.1	10806	75

The sound pressure level data shown above is quoted as free field and is forguidance only.
Actual levels produced may vary according to site conditions.

Enclosure Dimensions and Weights

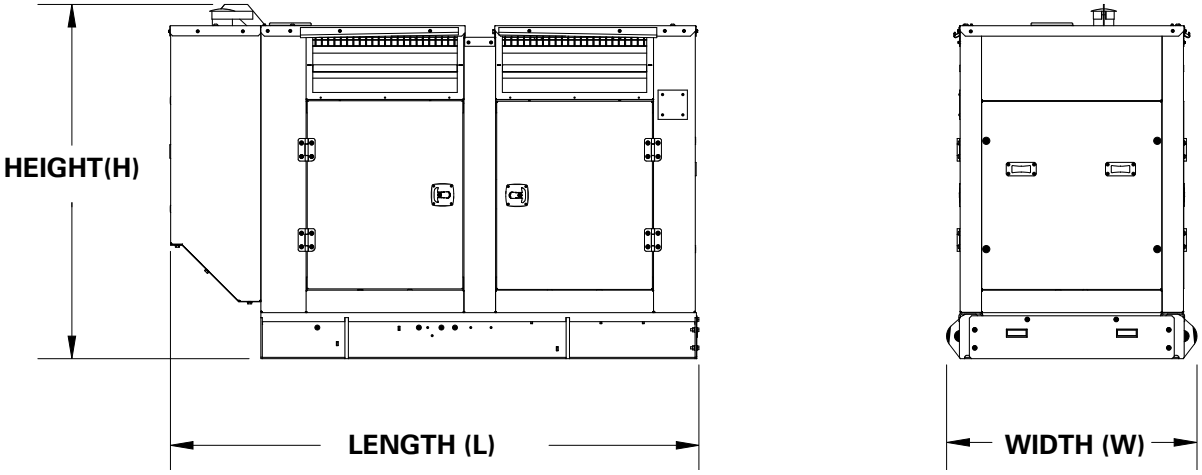

Image represents SA Level 1, SA Level 2 and SA Aluminum enclosures on skid base only

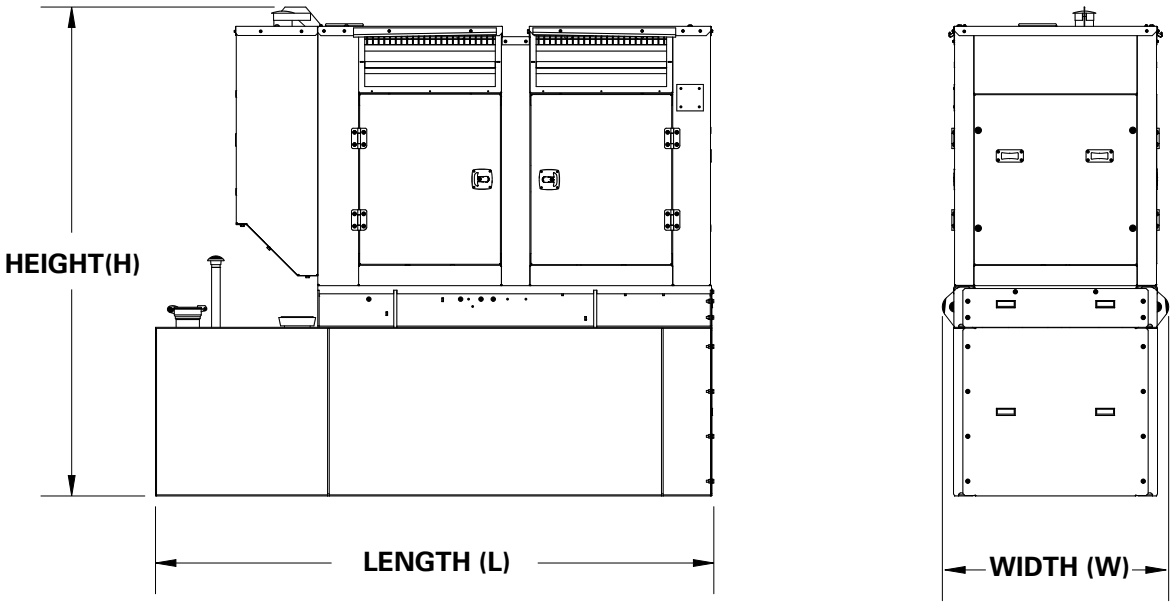

Image represents SA Level 1, SA Level 2 and SA Aluminum enclosures mounted on optional UL listed sub base tank

Model	Standby eKW	WP Industrial		SA Level 1		SA Level 2		SA Aluminum	
		kg	lb	kg	lb	kg	lb	kg	lb
D40-2	40	121	267	137	302	NA	NA	NA	NA
D50-2	50								
D60-2	60								
D80-8	80	263	580	313	690	321	708	142	312
D100-8	100								
D125-8	125	348	768	393	867	406	896	176	387
D150-10	150								
D175-4	175								
D200-2	200								

Enclosure weights (includes muffler)

Enclosure Dimensions Skid Bases

Engine Model	Generator Set Rating ekW	Enclosure	Width 'W'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in
C4.4	40	WP	1075	42.3	1972	77.6	1378	54.3
	50							
	60							
	40	SA Level 1, SA Level 2 and SA Aluminum	1075	42.3	1972	77.6	1378	54.3
	50							
	60							
C4.4	80	WP	1110	43.7	2523	99.3	1773	69.8
	100							
	80	SA Level 1, SA Level 2 and SA Aluminum	1110	43.7	2891	113.8	1852	72.9
	100							
C7.1	125	WP	1110	43.7	3204	126.1	1773	69.8
	150							
	175							
	200							
	125	SA Level 1, SA Level 2 and SA Aluminum	1110	43.7	3659	144.1	1852	72.9
	150							
	175							
	200							

Enclosure Dimensions on UL Listed Sub Base Tanks

Engine Model	Generator Set Rating ekW	Enclosure	137 Gallon Sub Base Tank				255 Gallon Sub Base Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C4.4	40	WP	2503	98.5	1912	75.3	2503	98.5	2241	88.2
	50									
	60									
	40	SA Level 1, SA Level 2 and SA Aluminum	2503	98.5	1912	75.3	2503	98.5	2241	88.2
	50									
	60									

Engine Model	Generator Set Rating ekW	Enclosure	209 Gallon Sub Base Tank				394 Gallon Sub Base Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C4.4	80	WP	3447	135.7	2258	88.9	3447	135.7	2608	102.7
	100									
	80	SA Level 1, SA Level 2 and SA Aluminum	3447	135.7	2337	92.0	3447	135.7	2687	105.8
	100									

Engine Model	Generator Set Rating ekW	Enclosure	402 Gallon Sub Base Tank				777 Gallon Sub Base Tank			
			Length 'L'		Height 'H'		Length 'L'		Height 'H'	
			mm	in	mm	in	mm	in	mm	in
C7.1	125	WP	4035	158.9	2420	95.3	5035	198.2	2706	106.5
	150									
	175									
	200									
	125	SA Level 1, SA Level 2 and SA Aluminum	4035	158.9	2499	98.4	5035	198.2	2785	106.5
	150									
	175									
	200									

Note: Weight includes oil and coolant but not fuel

Ref: WPIA, WPIB, WPIC, SATCBA, SATCBB, SAT, CBC, SATFBA, SATFBB, SATFBC, ENCAL02, ENCAL03, ENCAL04.

www.Cat.com/electricpower
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6. VISUAL QUALITY & SCENIC CHARACTER

As further described in the City of Portland Site Plan Application for the proposed development, the architecture and landscaping have been designed to create a visual connection with existing campus buildings with a goal of achieving a cohesive campus appearance. The project will be characterized by excellence in architectural design, craftsmanship, materials, streetscape and landscape improvements, signage and lighting appropriate for a university in an urban setting in the Northeast.

The Site Plan Application includes renderings of the proposed development. It is not anticipated that the proposed development will result in any negative visual impacts.

7. WILDLIFE & FISHERIES

The Site has been previously developed and there are no known areas of significant natural features, including areas of significant wildlife habitats or wetlands. The attached Official Species List identifies the northern long-eared bat, which has been listed as a Federally Threatened Species, in association with the project area; however, there are no critical habitat areas located within the project area. Based on US Fish & Wildlife information, the northern long-eared bat typically lives in caves during the winter months and in trees larger than three inches in diameter during the summer, with migration between these two habitats in the spring in the fall. The project is located in an existing urban, developed area and no trees meeting the criteria for bat habitat are proposed to be impacted by the project. It is not anticipated that the proposed development will have a negative impact on the northern long-eared bat.

A letter has been sent to the Maine Department of Inland Fisheries and Wildlife (MDIFW) requesting information regarding any known threatened or endangered species or critical habitat relative to the project area; a copy of this letter is attached to this Section for your reference. A copy of the MDIFW response can be provided upon receipt.

7.1 LIST OF ATTACHMENTS

- Official Species List; and
- MDIFW Environmental Review Request Letter.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: February 24, 2020
Consultation Code: 05E1ME00-2020-SLI-0740
Event Code: 05E1ME00-2020-E-02458
Project Name: USM Portland Student Housing

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2020-SLI-0740

Event Code: 05E1ME00-2020-E-02458

Project Name: USM Portland Student Housing

Project Type: DEVELOPMENT

Project Description: Proposed development on the USM Portland campus on the corner of Bedford Street and Durham Street in Portland, ME

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.6628773524905N70.27456771513867W



Counties: Cumberland, ME

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, ME 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

March 5, 2020

Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333

RE: USM Career and Student Success Center and Residence Hall – Environmental Review Request

Dear Reviewer:

The University of Southern Maine (USM), is proposing to construct a new Career and Student Success Center and a new Residence Hall to be located at 23-29 Bedford Street, on the Portland, Maine campus. The project represents a significant implementation of the USM Facilities Master Plan. In addition to the 58,200 SF Student Success Center and the 580-bed Residence Hall the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services; site lighting; and other site amenities..

The proposed work will require an amendment to the existing Maine Department of Environmental Protection Site Location of Development Permit (L-20438-22-D-A), which requires coordination with the Maine Department of Inland Fisheries and Wildlife (MDIFW). On behalf of USM, we are requesting a review of the project area for any known threatened or endangered species or critical habitat. A Site Location Map and Site Plan have been attached for your reference.

We appreciate your review of this project. If you have any questions regarding this information or the proposed project, please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com. Thank you for your assistance.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) Site Location Map
Site Plan

PN: 0232656.00

8. HISTORIC SITES

A letter has been sent to the Maine Historic Preservation Commission (MHPC) requesting a review of the project area relative to historic properties; a copy of this letter is attached to this Section for your reference. A copy of the MHPC response can be provided upon receipt.

This project is not located within, or within 100 feet, of any City Historic District. There are no Historic Resources located within or within 100 feet of the project limits.

8.1 LIST OF ATTACHMENTS

- MHPC Project Review Request Letter.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, ME 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

March 5, 2020

Kirk F. Mohney, Director
Maine Historic Preservation Commission
55 Capitol Street, 65 State House Station
Augusta, Maine 04333-0065

Re: USM Career and Student Success Center and Residence Hall – Project Review Request

Dear Mr. Mohney:

The University of Southern Maine (USM), is proposing to construct a new Career and Student Success Center and a new Residence Hall to be located at 23-29 Bedford Street, on the Portland, Maine campus. The project represents a significant implementation of the USM Facilities Master Plan. In addition to the 58,200 SF Student Success Center and the 580-bed Residence Hall the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services; site lighting; and other site amenities..

The proposed work will require an amendment to the existing Maine Department of Environmental Protection Site Location of Development Permit (L-20438-22-D-A), which requires coordination with the Maine Historic Preservation Commission (MHOC). On behalf of USM, we are requesting a review of the project area for any known threatened or endangered species or critical habitat. A Site Location Map and Site Plan have been attached for your reference.

We appreciate your review of this project. If you have any questions regarding this information or the proposed project, please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com. Thank you for your assistance.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) USGS Map
Site Plan

PN: 232656.00

9. UNUSUAL NATURAL AREAS

The Site has been previously developed and there are no known unusual natural areas. A letter has been sent to the Maine Natural Areas Program (MNAP) requesting a review of the Site relative to rare and exemplary botanical features; a copy of this letter is attached to this Section for your reference. A copy of the MNAP response can be provided upon receipt.

9.1 LIST OF ATTACHMENTS

- MNAP Site Review Request Letter.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, ME 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

March 5, 2020

Maine Natural Areas Program
177 State House Station
Augusta, ME 04333-0093

RE: USM Career and Student Success Center and Residence Hall – Site Review Request

Dear Reviewer:

The University of Southern Maine (USM), is proposing to construct a new Career and Student Success Center and a new Residence Hall to be located at 23-29 Bedford Street, on the Portland, Maine campus. The project represents a significant implementation of the USM Facilities Master Plan. In addition to the 58,200 SF Student Success Center and the 580-bed Residence Hall the project will include: a new Campus Quad; pedestrian connections; integrated hardscape and landscape; a new service and loading area; stormwater management; new utility services; site lighting; and other site amenities..

The proposed work will require an amendment to the existing Maine Department of Environmental Protection Site Location of Development Permit (L-20438-22-D-A), which requires coordination with the Maine Natural Areas Program (MNAP). On behalf of USM, we are requesting a review of the project area for any known threatened or endangered species or critical habitat. A Site Location Map and has been attached for your reference.

We appreciate your review of this project. If you have any questions regarding this information or the proposed project, please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com. Thank you for your assistance.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) Site Location Map

PN: 0232656.00

10. BUFFERS

The Site has been previously developed. There are no existing or proposed buffers. This Section is not applicable.

11. SOILS

Copies of the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey and the Geotechnical Report prepared for the Site are attached to this Section for your reference

11.1 LIST OF ATTACHMENTS

- United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey
- Geotechnical Report


70° 16' 35" W
70° 16' 21" W
43° 39' 49" N
43° 39' 43" N
397090
397120
397150
397180
397210
397240
397270
397300
397330
397360
397390
4835320
4835290
4835260
4835230
4835200
4835170
4835140
Falmouth
Durham St
302
Wood Rd
Cu
WmB
HrC
Bedford St
Bedford
Soil Map may not be valid at this scale.
Map Scale: 1:1,440 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 20 40 80 120
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 16, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cu	Cut and fill land	0.5	13.2%
HrC	Lyman-Tunbridge complex, 8 to 15 percent slopes, rocky	1.1	26.7%
WmB	Windsor loamy sand, 0 to 8 percent slopes	2.4	60.1%
Totals for Area of Interest		**4.0**	**100.0%**

REPORT

19-1813 S

January 28, 2020

Preliminary Geotechnical Engineering Services

Proposed Residential Hall
& Student Success Center
University of Southern Maine
Bedford Street and Durham Street
Portland, Maine

Prepared For:
University of Southern Maine
Capital Planning & Project Management
Attention: Ann Vashon, Project Manager
25 Bedford Street
Portland, Maine 04101

Prepared By:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039
T: 207-657-2866

S.W.COLE ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing and Special Inspections*
- *GeoEnvironmental Services*
- *Test Boring Explorations*

www.swcole.com

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Appendix C Exploration Logs & Key

19-1813 S

January 28, 2020

University of Southern Maine
Capital Planning & Project Management
Attention: Ann Vashon, Project Manager
25 Bedford Street
Portland, Maine 04101

Subject: Preliminary Geotechnical Engineering Services
Proposed Residential Housing & Student Success Center
University of Southern Maine
Bedford Street & Durham Street
Portland, Maine

Dear Ann:

In accordance with our Contract, dated January 14, 2020, we have reviewed prior subsurface explorations for the subject project. This report summarizes our findings and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to review our prior subsurface information at the site in order to assess suitable foundation types and earthwork considerations associated with the proposed building construction. Our scope of services included a review of prior explorations completed at the site in July 2019, a geotechnical assessment of the subsurface findings and preparation of this report.

1.2 Site and Proposed Construction

The site of the proposed construction is located on the University of Southern Maine (USM) Portland Campus and is situated on the easterly side of the intersection of Durham and Bedford Streets in Portland, Maine. The site is currently occupied by two buildings,

as well as paved and landscaped areas. We understand the existing Woodbury Campus Center and the adjacent facilities office building structures will be razed in favor of the proposed construction.

Based on conceptual information provided at this time, we understand redevelopment plans call for construction of a student housing structure and a student center building. The student housing structure will consist of two connected L-shaped structures; one 8-story and one 5-story, with on-grade floor slabs on the ground floor level. The Student Success Center is proposed on the westerly side of the Student Housing buildings in an area currently occupied by paved parking and landscaped areas. The proposed Student Center structure will be 4-stories.

Proposed and existing site features are shown on the "Exploration Location Plan" attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Eight test borings (B-19-1 through B-19-8) were made at the site on July 30 and 31, 2020 by S. W. Cole Explorations, LLC. The exploration locations were selected by USM and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using measurements from existing site features. The approximate exploration locations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C.

2.2 Testing

The prior test borings were drilled using hollow stem auger techniques. The soils were sampled at 2 to 5 foot intervals using a split spoon sampler and Standard Penetration Testing (SPT) methods. Pocket Penetrometer Tests (PPT) were performed where stiffer cohesive soils were encountered. SPT blow counts and PPT results are shown on the logs.

Soil samples obtained from the explorations were returned to our laboratory for further visual classification. Laboratory testing was not requested by the client.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

Beneath a surficial layer of pavement or topsoil, test borings B-19-1, B-19-2, B-19-3, B-19-6, B-19-7 and B-19-8, made in the proposed Residence Hall and Student Success Center development area, encountered a soil profile generally consisting of uncontrolled fill overlying native deposits of glaciomarine sand, silt and clay, overlying a thin veneer of outwash sand, mantling refusal surfaces (probable bedrock) at depths varying from about 11 to 26 feet below the ground surface. The uncontrolled fills generally varied from 1 to 3 feet thick, except at B-19-6 where the uncontrolled fills extend down to probable bedrock at a depth of about 13 feet, and B-19-7 where the uncontrolled fill extend down to what appears to be native sand and silt at a depth of about 9 feet.

Test borings B-19-4 and B-19-5 were made northwest of the proposed development area and encountered a surficial layer of topsoil overlying native deposits of silty sand, overlying shallow refusal surfaces (probable bedrock) at depths of about 5 feet below the ground surface.

Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

3.2 Groundwater

The soils encountered at the test borings were moist to wet from the ground surface. Groundwater was encountered at depths varying from about 8 to 16 feet in the borings within the proposed development area. Groundwater likely becomes perched on the relatively impervious silty clay and bedrock surfaces encountered at the test borings. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 Foundation and Floor Slab Considerations

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle foundation and floor slab considerations include:

Residential Hall: The subsurface conditions beneath the proposed Residential Hall are generally unsuitable for direct support of spread footing foundations; consequently, we recommend pile-supported foundations or, rigid inclusions be considered to improve the ground for support of spread footing foundations.

On-grade floor slabs bearing on a layer of compacted Structural Fill overlying properly prepared soil subgrades appear feasible for the Residential Hall.

Based on the available subsurface information, we preliminarily interpret the soil profile beneath the Residence Hall at correspond to Seismic Soil Site Class E (IBC 2015).

Student Success Center: Although none of the prior test borings are located directly beneath the Student Success Center, the nearby test borings suggest the trend of soil and bedrock conditions generally improves from east to west. We anticipate the Student Success Center is likely underlain by uncontrolled fills overlying stable native sands, overlying relatively shallow bedrock. At this time, based on the nearby exploration information, we recommend planning consider aggregate pier ground improvement or, over-excavation and replacement of unsuitable soils with compacted Structural Fill for support of spread footing foundations.

On-grade floor slabs bearing on a layer of compacted Structural Fill overlying properly prepared soil subgrades appear feasible for the Student Success Center.

Based on the available subsurface information, we anticipate the soil profile beneath the Student Success Center would correspond to Seismic Soil Site Class D (IBC 2015).

4.2 Excavation and Dewatering Considerations

Excavation work will generally encounter uncontrolled fills, silty sand, silt, clay soils, groundwater, and bedrock with depth. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur ideally during drier, non-freezing weather of Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the native silt and clays, when wet. Low ground pressure tracked equipment may be needed and temporary haul roads overlying geotextile fabric may be necessary. Final cuts to soil subgrades should be performed with a smooth-edged bucket to help reduce strength loss from soil disturbance.

Based on the trend of subsurface findings, we anticipate bedrock removal may be required in the western portion of the development area. As blasting is restricted in the City of Portland, bedrock removal by hoe-ramming should be anticipated. We recommend pre-construction surveys be completed on surrounding structures, water supply wells and infrastructure prior to commencing excavation activities.

Vibrations from construction should be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site. More restrictive vibration limits may be warranted in specific cases with sensitive equipment, historic structures or artifacts on-site or within close proximity.

Sumping and pumping dewatering techniques should be adequate to control groundwater in foundation and most utility excavations. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

The on-site granular fills and native sands may be suitable for reuse as compacted Granular Borrow in paved and landscape areas. The drier native silts and clays are unsuitable for reuse in building and paved areas, but may be reused in landscape areas. The saturated silts and clays are unsuitable for reuse and should be properly disposed off-site.

4.3 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.4 Recommendations for Additional Study

We recommend additional test boring explorations and in-situ geophysical testing be performed at the site to further explore the subsurface conditions and Seismic Site Class.

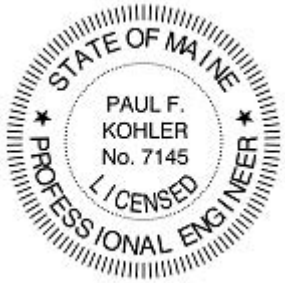
5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the design phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.

Paul F. Kohler, P.E.
Senior Geotechnical Engineer



TJB:pfk/emw

APPENDIX A

Limitations

This report has been prepared for the exclusive use of the University of Southern Maine (USM) for specific application to the proposed Residence Hall and Student Success Center on the USM Campus in Portland, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

APPENDIX B

Figures



LEGEND:

APPROXIMATE BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=60' SCALE PLAN OF THE SITE PROVIDED BY UNIVERSITY OF SOUTHERN MAINE, (USM) AND OVERLAID WITH A 1"=30' SCALE PLAN ENTITLED "BORING PLAN," PREPARED BY SMRT AND PROVIDED AS A PORTABLE DOCUMENT FORMAT (PDF) FILE.
2. THE BORING LOCATIONS WERE SELECTED AND ESTABLISHED IN THE FIELD BY USM AND LOCATED ON THIS PLAN BY MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND IS NOT TO BE USED FOR CONSTRUCTION.

0 30 60 Feet

S.W.COLE ENGINEERING,INC.

UNIVERSITY OF SOUTHERN MAINE

EXPLORATION LOCATION PLAN

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED STUDENT HOUSING AND SUCCESS CENTER
BEDFORD STREET
PORTLAND, MAINE

Job No.:	19-1813	Scale:	1" = 30'
Date :	01/28/2020	Sheet:	1

R:\2019\19-1813\CAD\Drawings\19-1813-EEP.dwg 1/28/2020 12:05 PM 11, CDeL.S. W. Cole Engineering Inc.

APPENDIX C

Exploration Logs and Key

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-1
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/30/2019
DATE FINISH: 7/30/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 25' Estimated | **TOTAL DEPTH (FT):** 25.5 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 16 ft 7/30/2019 Soils Saturated at 16 +/- ft
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0.4-2.4	24/18	4-7-6-6			0.3 Asphalt Pavement Medium dense dark brown fine to medium SAND with some silt and gravel (Fill)	
										2.0 Very stiff becoming stiff brown Silty CLAY with some brown sand layers	
20	5		2D		5-7 6-	24/24	3-5-9-10	q_P=7 to 8 ksf			
										9.0 Loose or soft brown Silty CLAY with silty sand layers	
15	10		3D		10-12 11-	24/20	WOH-2-3-5	q_P=5 to 7 ksf		11.0 Very stiff to stiff brown Silty CLAY with some brown silty sand layers	
					14-			q_P=2 ksf		14.0 Medium brown silty CLAY with brown silty sand layers	▽
10	15		4D		15-17	24/24	1-2-4-1				
					17-			q_P=0.3 ksf		16.5 Soft gray Silty CLAY	
										19.0 Medium gray sandy silty CLAY with gray sand layers	
5	20		5D		20-22 20.5-	24/24	3-3-7-10	q_P=1 ksf		21.0 Medium dense brown fine SAND with some silt, some clayey silt layers Some gravel	
0	25		6D		25-25.3	4/4	60/4"			25.0 Dense brown Silty SAND and GRAVEL	

Auger Refusal at 25.5 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-1

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-2
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/30/2019
DATE FINISH: 7/30/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 26.5' Estimated | **TOTAL DEPTH (FT):** 17.0 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Brett Raiche | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 14 ft 7/30/2019 Saturated soils at 14 ft +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
25			1D		0.3-2.3	24/18	6-2-2-4			0.3 Asphalt Pavement 0.5 Medium dense brown Silty CLAY and SAND (Mixed Fill) 1.2 Medium dense brown SAND, some silt, some gravel (Fill) Very stiff brown Silty CLAY, occasional sand layers	
	5		2D		5-7 5.5-	24/20	2-3-4-5	q_P=6 to 7 ksf			
20										9.0 Soft or loose brown Silty Sandy CLAY	
	10		3D		10-12 11-	24/24	WOH- 2-2-4	q_P=1 to 1.5 ksf		10.5 Medium varved brown Silty CLAY with frequent sand layers	▽
15											
	15		4D		15-16.3	16/8	6-10- 50/4"			14.5 Medium dense brown Silty SAND, some fine gravel, pieces of broken rock in tip of spoon	
10											

Auger Refusal at 17.0 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-2

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-3
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/30/2019
DATE FINISH: 7/30/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 31.5' Estimated | **TOTAL DEPTH (FT):** 11.5 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 8 ft 7/30/2019 Sand seams wet at 8 +/- ft
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth
30			1D		0.3-2.3	24/14	6-8-4-4			0.3 Asphalt Pavement 1.0 Medium dense brown Gravelly SAND, trace silt (Fill)	
					2-			q_P=8 ksf		Very stiff brown Silty CLAY, some thin brown sand layers	
	5		2D		5-7	24/20	5-3-4-5				
25					6-			q_P=4 to 7 ksf			▽
										8.0 Medium dense brown SAND, some silt	
	10		3D		10-11.5	18/14	3-2-60				
20										11.0 Probable weathered BEDROCK Auger Refusal at 11.5 feet Probable Bedrock	

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-3

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

S.W.COLE EXPLORATIONS, LLC

BORING LOG

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-4
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 42' Estimated | **TOTAL DEPTH (FT):** 5.3 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): 7/31/2019 No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: Water Level; ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0-2	24/12	1-3-5-9			Topsoil with organics	
										0.7 Medium dense light brown Silty SAND, trace fine gravel	
40											
										3.0 Medium dense brown Silty SAND, some gravel, pieces of broken rock in tip of spoon	
	5		2D		5-5.3	3/3	50/3"			5.0 Probable weathered BEDROCK	
										Auger Refusal at 5.3 feet Probable Bedrock	

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-4

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-5
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 42' Estimated | **TOTAL DEPTH (FT):** 5.0 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): 7/31/2019 No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0-2	24/14	1-1-4-12			0.3 Topsoil with organics 0.8 Medium dense light brown Silty SAND, trace fine gravel	
40			2D		2-4	24/16	12-18-18-30			Medium dense to dense brown Silty SAND, some gravel, pieces of broken rock in tip of spoon	
	5									4.0 Probable weathered BEDROCK	

Auger Refusal at 5.0 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-5

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

S.W.COLE EXPLORATIONS, LLC

BORING LOG

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-6
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan
ELEVATION (FT): 41.5' Estimated
TOTAL DEPTH (FT): 13.3
LOGGED BY: Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC
DRILLER: Corey Culligan
DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50
AUGER ID/OD: 2 1/4 in / 5 5/8 in
SAMPLER: Standard Split-Spoon
HAMMER TYPE: Automatic
HAMMER WEIGHT (lbs): 140
CASING ID/OD: N/A /N/A
CORE BARREL:
HAMMER EFFICIENCY FACTOR: 0.91
HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): ▽ 11 ft 7/31/2019 Soils appear saturated at 11 ft +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
40			1D		0-2	24/14	4-16-11-10			0.3 Topsoil with organics Medium dense brown Silty SAND, some gravel (Probable Fill or disturbed soil)	
			2D		2-4	24/16	8-11-13-10				
	5		3D		5-7	24/20	6-9-9-9				
35											
	10		4D		10-12	24/6	5-5-5-3			Possible loose blast spoils FILL	▽
30										13.0 Probable weathered BEDROCK Auger Refusal at 13.3 feet Probable Bedrock	

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-6

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-7
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 33.5' Estimated | **TOTAL DEPTH (FT):** 12.3 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): 7/31/2019 No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0.5-2.5	24/15	20-16-12-9			0.5 Asphalt Pavement 0.8 Dense brown SAND and GRAVEL, trace silt (Pavement Base Fill) 1.5 Medium dense brown Gravelly SAND, trace silt (Pavement Subbase Fill)	
30										Medium dense to dense brown silty SAND, some gravel (Probable Fill)	
	5		2D		5-7	24/20	9-11-12-16				
25										9.0 Dense brown SAND and SILT with pieces of weathered rock	
	10		3D		10-11.7	20/16	11-28-38-50/2"			10.5 Very dense, highly weathered ROCK (Sapprolite) 11.7 Probable weathered BEDROCK	

Auger Refusal at 12.3 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-7

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

BORING LOG

S.W.COLE EXPLORATIONS, LLC

CLIENT: University of Southern Maine
PROJECT: Proposed Student Housing
LOCATION: University of Southern Maine, Portland, Maine

BORING NO.: B-19-8
SHEET: 1 of 1
PROJECT NO. 19-1813
DATE START: 7/31/2019
DATE FINISH: 7/31/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 29' Estimated | **TOTAL DEPTH (FT):** 13.9 | **LOGGED BY:** Paul Kohler
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.91 | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft 7/31/2019 Soils appeared saturated at 10 ft +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth
			1D		0.3-2.3	24/12	7-7-4-5			0.3 Asphalt Pavement 0.8 Medium dense brown Gravelly SAND, trace silt (Pavement Base Fill)	
										Loose brown silty SAND with brown silty CLAY (Mixed Fill)	
										3.0 Very stiff brown silty CLAY	
25	5		2D		5-7 6-	24/20	3-3-4-6	q_P=5 to 6 ksf			
20	10		3D		10-12 11-	24/20	4-6-8-7	q_P=1 to 2 ksf		9.0 Medium Dense, varved brown Silty SAND with brown silty clay layers	▽
										12.5 Probable cobbles or weathered BEDROCK	

Auger Refusal at 13.9 feet
Probable Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-19-8

BORING / WELL 19-1813 USM PRELIM.GPJ SWCE TEMPLATE.GDT 1/28/20

KEY TO NOTES & SYMBOLS
Test Boring and Test Pit Explorations

Stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

12. STORMWATER MANAGEMENT

The attached Stormwater Management Plan describes the proposed stormwater management measures for the project, as shown on the design drawings attached to Section 1 of this Report. A USGS map and a soils map are attached to Section 1 and Section 11 of this Report, respectively.

12.1 LIST OF ATTACHMENTS

- Stormwater Management Plan (Bound Separately)

13. URBAN IMPAIRED STREAM

The proposed development is not located within the watershed of an Urban Impaired Stream; the Urban Impaired Stream Standard does not apply.

14. BASIC STANDARD

The proposed project is located within a developed urban area; there are no other known protected resources associated with the Site. Based on a geotechnical investigation, the subsurface soil conditions at the site typically consist of uncontrolled fill overlying glaciomarine sand, silt, and clay. Bedrock was typically encountered at 5 to 26 feet below grade. Groundwater was encountered at depths ranging from 8 to 16 feet. The majority of the mapped surficial soils are stiff, silty clary which is most commonly classified as Hydrologic Type C soils. The Soil Erosion and Sediment Control Plan and compliance with the Basic Standard is described in the Stormwater Management provided as part of Section 12 of this Report.

During construction, the Contractor will be responsible for conducting inspections in accordance with the attached *Stormwater Erosion & Sediment Control Inspection Report Form* (or equivalent). Inspections shall be performed at least once a week, as well as before and after storm events. A person with knowledge of stormwater management and erosion and sediment control, including the standards and conditions of the permit approvals, shall conduct the inspections and perform maintenance of the facilities. If maintenance or modifications are necessary, implementation will be completed within seven days and prior to any rainfall event. After construction, the Owner will be responsible for inspecting and maintaining the Site's stormwater system.

14.1 LIST OF ATTACHMENTS

- Erosion & Sediment Control Inspection Report Form.

EROSION & SEDIMENT CONTROL
INSPECTION REPORT FORM

Inspectors: Date: ___ / ___ / _____

_____ of _____ (Project Owner)
_____ of _____ (Contractor)
_____ of _____
_____ of _____

Storm Event? ☐ Yes ☐ No Rainfall Amount _____ Storm Duration _____ hours

Visual Observations of Activity and Site Conditions:

Disturbed Soil Areas:

Storage Of Soils:

Sediment & Erosion Control Measures:

Construction Site Entrance:

Surface Stabilization:

Corrective Action Taken:

Attachments (if any):

Signature:

Name Title Date

15. GROUNDWATER

The proposed development is not located within a Significant Sand and Gravel Aquifer. As previously noted, the Site is comprised primarily of cut and fill land. The proposed development will not infiltrate to, or extract, groundwater and is not anticipated to result in any impacts to groundwater.

16. WATER SUPPLY

The proposed development will be provided with both fire protection water service and domestic water service as shown on the drawings that will connect to an existing public water main in Durham Street. SMRT has been working directly with the Portland Water District to determine the appropriate design for this work. An ability to serve determination will be provided upon receipt.

17. WASTEWATER DISPOSAL

The proposed development will be provided with sanitary sewer service to an existing sewer main located in Durham Street as shown on the drawings. A Wastewater Capacity Application will be submitted to the City under separate cover. A copy of the City's determination will be provided upon receipt.

18. SOLID WASTE

18.1 SOLID WASTE

All solid waste materials and recyclables from the proposed development will be transported and disposed of or recycled in accordance with applicable laws and regulations.

18.2 CONSTRUCTION & DEMOLITION DEBRIS

The proposed development will generate construction waste and demolition debris (CDD). The Contractor will be responsible for properly disposing of the CDD. The Contractor will be responsible for handling, managing, and disposing of all waste generated by construction in accordance with the Maine Solid Waste Management Regulations and all other applicable local, state, and federal regulations.

18.3 SPECIAL & HAZARDOUS WASTE

The proposed development is not anticipated to produce any hazardous waste. Site investigations identified the presence of typical urban fill, as is seen on redevelopment sites throughout the City. We anticipate that soils from the site may be classified as special waste and shall be handled and disposed of accordingly.

19. FLOODING

The proposed development is not located within a flood hazard zone, as shown on the FEMA Flood Insurance Rate Map attached to this Section. The proposed development will not cause or increase flooding or cause an unreasonable flood hazard to any adjacent structures. The 100-year flood plain is located off-site and is not within the viewport of the design drawings; therefore, the 100-year flood plain is not shown on the design drawings

19.1 LIST OF ATTACHMENTS

- FEMA Flood Insurance Rate Map

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 28	56.00	Disk set vertically in north face near the northwest corner of 3-story building housing the Casco Bank on Forest Avenue, 1.2 miles northwest along Forest Avenue from the Post Office near the intersection of Forest Avenue and Woodford Street.
RM 29	35.25	Copper bolt set in top of granite post flush with surface, located approximately 0.85 mile northwest along Forest Avenue from Post Office near intersection of Forest Avenue and Noyes Street, 9.0 feet northwest of northwest curb of Noyes Street and 8.5 feet southwest of southwest curb of Forest Avenue.
RM 30	25.36	Disk set in top of concrete foundation of Oakhurst Dairy building at No. 364 Forest Avenue, 35 feet southwest of north corner of building and level with street, approximately 0.55 mile northwest of Post Office near intersection of Hudson Street.
RM 31	11.88	MDOT plaque set in centerline of service doorway of Franklin Street Pumping Station at intersection of Franklin Street and Marginal Way.
RM 32	9.89	Brass disk set in top of reinforced concrete post 10 inches below present ground level, 250 feet south of C. Profenno Company, 127 Marginal Way, and 350 feet north of intersection of Preble Street and Marginal Way, 27.5 feet southeast of centerline of Marginal Way.
RM 33	36.80	Disk set vertically in northeast face of concrete foundation of 2-story brick building, 56 feet northwest of Seawall Street and 1 foot northwest of east corner of building, near Seawall Street Railroad Station and 360 feet north of crossing of Portland Terminal Railroad and Seawall Street.
RM 34	22.81	Disk set in sidewalk on west side of Saint John Street and opposite intersection of A Street at corner of entrance to Arlan's Shopping Center parking lot, in center of sidewalk and 4.28 feet west of western edge of Saint John Street and approximately 177.4 feet from Arlan's Store.
RM 35	12.83	Chiseled X cut in bolt on rim of fire hydrant on northwest side of Commercial Street, 550 feet northeast of High Street, 76 feet south of Pole No. 29.1, across from No. 322 Commercial Street.
RM 36	28.34	Disk set flush in top of concrete endwall railing at northwest end of Interstate 295 bridge over the Fore River, 21.7 feet south of Portland-South Portland city line sign, and 24.7 feet west of the centerline of Interstate 295 southbound, and 3.5 feet above pavement grade at curb line.
RM 37	22.23	Disk set vertically in center of south face of large rock set in second layer of masonry retaining wall on north of railroad tracks, 45.5 feet east of west end of wall, located .75 mile east from the overpass of U.S. Route 1 over tracks and 142 feet east of east edge of Emery Street foot bridge over tracks.
RM 38	15.56	Disk set vertically in southeast side of first concrete pier southeast of Commercial Street, 25.0 feet southeast of centerline of Commercial Street, 39 feet southwest of northeast end of pier, 0.85 mile west from Custom House at State Route 77 bridge over Fore River.

[1] National Geodetic Vertical Datum of 1929

Project Location

ZONE A2 (EL 10)
ZONE A4 (EL 11)
ZONE A1 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE C
ZONE C
ZONE C
ZONE C
ZONE C
ZONE B
ZONE B
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE V3 (EL 12)
ZONE A2 (EL 10)
ZONE A2 (EL 10)
ZONE A2 (EL 10)

BACK COVE
FORE RIVER
FORE RIVER
FORE RIVER

RM 28
RM 29
RM 30
RM 31
RM 32
RM 33
RM 34
RM 35
RM 36
RM 37
RM 38

WOODFORD STREET
REVERE
LINCOLN
COYLE
ASHMONT
BELMONT
FOREST STREET
DARTMOUTH
PORTLAND
TERMINAL RAILROAD
NOYES STREET
WILLIAM
DEERING AVENUE
FESSENDEN
HUDSON
DEERING AVENUE
LUDLOW
BRIGHTON AVENUE
STEVENS AVENUE
CAPISIC STREET
FROST
CONGRESS
PORTLAND
TERMINAL RAILROAD
LASSEL
MITTON
POWDERLAND
DAVIS
BEAMAN STREET
VALLEY
A STREET
ST JOHN STREET
C STREET
D STREET
PROMENADE
BRAMHALL
CHADWICK
VAUGHAN
WESTERN
SPRING
PARK AVENUE
CUMBERLAND
WINTER STREET
STATE STREET
BARRACKET ROAD
DANFORTH
EMERY
SALEM
PORTLAND TERMINAL RAILROAD
CANADIAN NATIONAL RAILWAY
COMMERCIAL
CANADIAN NATIONAL RAILWAY
HIGH STREET
PLEASANT STREET
SPRING STREET
CONGRESS
FORE STREET
PORTLAND HARBOR
CORPORATE LIMITS
THOMPSON POINT
CORPORATE LIMITS
MARGINAL WAY
SOMERSET
LANCASTER
PREBLE STREET
CEDAR
CHAPEL
STONE
CUMBERLAND
PEARL
WILMOT
ALDER
BRACKETT
HANOVER
EMERY
AVENUE
STREET
COVE
ANDERSON
WASHINGTON AVENUE
HAMMOND AVENUE
DIAMOND
FOX
MADISON
KENNEDY
FRANKLIN
EAST
MAYO
OXFORD
SMITH
BOYD
STREET
AVENUE

ADJOINING AREA SHOWN AS INSET A ON PANEL 230051 0016 B

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary
ZONE B
ZONE A1
ZONE A5
ZONE B
Base Flood Elevation Line With Elevation In Feet**
513
Base Flood Elevation in Feet Where Uniform Within Zone**
(EL 987)
Elevation Reference Mark
RM7×
Zone D Boundary
River Mile
•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance and flood plain management purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas. The coastal flooding elevations shown may differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

For adjoining map panels, see separately printed Index To Map Panels.

Coastal base flood elevations shown on this map include the effects of wave action.

Coastal base flood elevations apply only landward of 0.0 NGVD.

INITIAL IDENTIFICATION:
APRIL 29, 1977
FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 17, 1986
FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

COASTAL BASE FLOOD ELEVATIONS APPLY ONLY LANDWARD OF 0.0 NGVD

Federal Emergency Management Agency

20. BLASTING

Based on geotechnical investigations completed to date, no blasting is anticipated for this project. Any rock removal required will be accomplished through mechanical means. The geotechnical report for this project is attached to Section 11.

21. AIR EMISSIONS

The project is not anticipated to require an air emissions license; this Section is not applicable.

22. ODORS

The proposed development will not involve any processes that emit significant odors; this Section is not applicable.

23. WATER VAPOR

The proposed development will not involve any processes that emit water vapors; this Section is not applicable.

24. SUNLIGHT

The Oakhurst Dairy facility, which is separated from the USM property by Durham Street, has a series of solar panels located on a two rooftops; one set on a lower service building fronting on Durham Street, as well as several located on a taller portion of the facility adjacent to Forest Avenue. The proposed Residence Hall, which will be constructed within the allowable building height of the USM Overlay Zone, may partially block sunlight to the lower roof top at certain times of the day and year. It is not anticipated that the Residence Hall will block sunlight to the majority the Oakhurst rooftops for the majority of the year. There may be short portions of the day during the mid-winter months (when the sun is lowest on the horizon) that shadows may be cast on the lower rooftop.

25. NOTICES

The City of Portland has Delegated Review Authority for this application; as such, it is our understanding that the public notice requirements associated with MaineDEP Site Law do not apply.

[redacted]

WOODARD &CURRAN

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

UNIVERSITY OF SOUTHERN MAINE

PORTLAND, MAINE

CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

REISSUED FOR PERMITTING

7-24-20

APPLICANT INFORMATION

OWNER:

UNIVERSITY OF SOUTHERN MAINE
BEDFORD STREET
PORTLAND, MAINE 04101
PH: 207-780-4160

PERMITS

CITY OF PORTLAND

LEVEL III SITE PLAN APPLICATION
SITE LOCATION AND DEVELOPMENT ACT (DELEGATED REVIEW)

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

SITE LOCATION OF DEVELOPMENT ACT

CONSULTANT INFORMATION

SURVEYOR:

SURVEYWORKS, INC.
7 COBBLESTONE DRIVE, SUITE 4
TURNER, MAINE 04282
PH: 207-200-1678

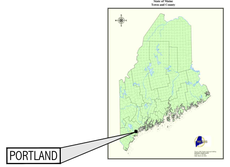
ARCHITECT/CIVIL ENGINEER/LANDSCAPE ARCHITECT
/STRUCTURAL ENGINEER/ELECTRICAL ENGINEER
/MECHANICAL ENGINEER/INTERIOR DESIGNER:

SMRT, INC.
144 FORE STREET
PORTLAND, MAINE 04104
PH: 207-772-3846

ELKUS MANFREDI ARCHITECTS
25 DRYDOCK AVENUE
BOSTON, MASSACHUSETTS 02210
PH: 617-426-1300

DRAWING LIST

GI001	COVER SHEET
SITE	
C-001	SITE NOTES & LEGENDS
CD101	EXISTING CONDITIONS & DEMOLITION PLAN
CD102	BUILDING DEMOLITION PLAN
CP101	SITE LAYOUT PLAN
CP501	SITE LAYOUT DETAILS
CP502	SITE LAYOUT DETAILS
CE001	EROSION & SEDIMENT CONTROL NOTES
CE101	EROSION & SEDIMENT CONTROL PLAN
CE501	EROSION & SEDIMENT CONTROL DETAILS
CG101	GRADING & DRAINAGE PLAN
CG501	GRADING & DRAINAGE DETAILS
CG502	GRADING & DRAINAGE DETAILS
CU101	UTILITY PLAN
CU102	STEAM LINE PLAN
CU501	UTILITY DETAILS
ARCHITECTURAL - RESIDENCE HALL	
1.A200	EXTERIOR ELEVATIONS
1.A201	EXTERIOR ELEVATIONS
1.A202	EXTERIOR ELEVATIONS
1.A203	EXTERIOR ELEVATIONS
ARCHITECTURAL - CAREER AND STUDENT SUCCESS CENTER	
2.A200	EXTERIOR ELEVATIONS
2.A201	EXTERIOR ELEVATIONS
SITE ELECTRICAL	
ES103	PHOTOMETRIC PLAN
ES104	PHOTOMETRIC PLAN
PLANTING	
LP101	PLANTING & LANDSCAPING PLAN
LP501	PLANTING & LANDSCAPE DETAILS & SCHEDULE





LOCUS

PERMITTING REQUIREMENTS

MUNICIPAL	SUBMITTED	STATUS
LEVEL B SITE PLAN APPROVAL	3-6-20 7-24-20 (REVISED)	UNDER REVIEW
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION		
SITE LOCATION OF DEVELOPMENT ACT AMENDMENT (DELEGATED REVIEW BY THE CITY OF PORTLAND, ME)	3-6-20 7-24-20 (REVISED)	UNDER REVIEW
MAINE GENERAL CONSTRUCTION PERMIT	PRIOR TO CONSTRUCTION	

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20
CURRENT ISSUE STATUS:

STATE OF MAINE
JEFFREY
ACETO
No. 6418
LICENSED
PROFESSIONAL ENGINEER

SMRT Architects and Engineers
75 Washington Avenue, Suite 3A
Portland, Maine 04101
1.877.700.7678
www.smrtinc.com
Architecture • Engineering • Planning

UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

COVER SHEET

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	GI001-19206	SHEET No.	GI001

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NOT FOR CONSTRUCTION

24x36

GENERAL NOTES

1. THE SCOPE OF SITE WORK FOR THIS PROJECT INCLUDES PROTECTION OF EXISTING STRUCTURES AND UTILITIES, AND REINSTATEMENT OF DISTURBED AREAS OF THE SITE TO MATCH EXISTING CONDITIONS. THE EXISTING CONDITIONS SHOWN ON THE PROJECT DRAWINGS ARE TAKEN FROM RECORD DRAWINGS AND HISTORICAL INFORMATION. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SITE CONDITIONS PRIOR TO THE START OF WORK AND CONTACT THE PROJECT ARCHITECT IMMEDIATELY IF DISCREPANCIES ARE FOUND.
2. EXISTING UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM HISTORICAL RECORDS AND PREVIOUS DESIGN DRAWINGS. NO GUARANTEE IS MADE THAT THE UTILITIES SHOWN WILL BE FOUND IN THE LOCATIONS INDICATED, OR THAT THE INFORMATION SHOWN IS COMPLETE. INFORMATION ON EXISTING UTILITY LOCATIONS IS PROVIDED FOR REFERENCE ONLY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING EXISTING UTILITY LOCATIONS AND DEPTHS AND COORDINATING THE WORK ACCORDINGLY.
3. THE CONTRACTOR SHALL UNDERTAKE TEST PITS AT THE SITE AND ENGAGE PRIVATE UTILITY DETECTION SERVICE, AS NECESSARY, TO ACCURATELY IDENTIFY UTILITIES IN ORDER TO EFFICIENTLY PLAN AND COMPLETE THE WORK.
4. THE CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITIES ADJACENT TO THE WORK. ANY DAMAGE TO EXISTING STRUCTURES, ROADS, SIDEWALKS, UTILITIES, OR OTHER SITE FEATURES CAUSED BY THE WORK SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.
5. ANY UTILITY REPAIRS OR RECONFIGURATION REQUIRED AS PART OF THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION.
6. TEMPORARY WORKS, SUPPORT AND PROTECTION OF STRUCTURES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE COSTS SHALL BE CONSIDERED INCIDENTAL TO THE OVERALL PROJECT SUM.
7. ALL WORK SHALL BE UNDERTAKEN IN STRICT ACCORDANCE WITH LOCAL, STATE AND FEDERAL SAFETY STANDARDS.
8. OPEN EXCAVATIONS AND WORK AREAS SHALL BE CLEARLY DELINEATED AND FENCED, AS NECESSARY TO PREVENT UNAUTHORIZED ACCESS
9. DRIVEWAYS, WALKWAYS AND ENTRANCES SERVING PREMISES SHALL BE KEPT CLEAR AND AVAILABLE TO OWNER, OWNER'S EMPLOYEES, AND EMERGENCY VEHICLES, AS NECESSARY TO MAINTAIN THE FUNCTION OF THE FACILITY. COORDINATE ALL WORK WITH OWNER TO ENSURE THAT ADEQUATE ACCESS AND CIRCULATION IS MAINTAINED AT ALL TIMES.
10. DE-WATERING, IF NECESSARY, SHALL BE UNDERTAKEN IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL STANDARDS. NO DISCHARGE OF SEDIMENT LADEN RUNOFF TO SURFACE WATERS, OR THE PIPED STORM DRAIN SYSTEM AT THE SITE SHALL BE ALLOWED.
11. ALL DISTURBED PAVEMENT AREAS, ROADS AND SIDEWALKS SHALL BE REINSTATED TO MATCH EXISTING GRADES, MATERIALS AND DEPTHS.
12. EXISTING PAVEMENT SHALL BE SAW-CUT AT LEAST TWELVE INCHES INTO SOUND MATERIAL TO PROVIDE A CLEAN, STRAIGHT EDGE BETWEEN EXISTING SOUND SURFACE MATERIAL AND THE REPAIRED AREA.
13. A SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN REPAIR WORKS AND EXISTING PAVEMENT. ALL REINSTATED AREAS SHALL BE GRADED TO PITCH UNIFORMLY TO ENSURE POSITIVE DRAINAGE.

LAYOUT NOTES:

1. DO NOT SCALE THE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY OMISSIONS IN DIMENSIONING SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT FOR DECISION. ANY DISCREPANCIES BETWEEN DRAWINGS, DETAILS, NOTES, AND SPECIFICATIONS SHALL IMMEDIATELY BE REPORTED TO THE ARCHITECT FOR FURTHER DIRECTION AND RESOLUTION BEFORE ANY ADDITIONAL WORK PROCEEDS.
2. ALL ANGLES ARE 90 DEGREES UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS FROM BUILDING ARE TO FACE OF BUILDING FOUNDATION. ALL DIMENSIONS FROM CURBS ARE TO FACE OF CURB.
4. PROVIDE A SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING WORK.
5. CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND LOCAL UTILITY COMPANIES TO VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION.
6. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR WORK SHOWN ON THESE PLANS.
7. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS AND MEET OR EXCEED CITY OF PORTLAND STANDARDS.
8. PROVIDE TAPERED END SECTIONS AT ALL CURB ENDS.
9. EXISTING CONDITIONS AND TOPOGRAPHIC DATA ARE BASED UPON TOPOGRAPHIC SURVEY PREPARED BY SURVEYWORKS, INC., TURNER, MAINE, AND DATED 2-14-2020.

GRADING NOTES:

1. SOIL DISTURBANCE IS TO BE KEPT TO A MINIMUM AND ALL DISTURBED AREAS SHALL BE STABILIZED (WITH PERMANENT OR TEMPORARY MEASURES) AS QUICKLY AS POSSIBLE.
2. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL BE LOAMED AND SEEDED (6" DEPTH).
3. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED ON A REGULAR BASIS AND AS REQUIRED AFTER STORM EVENTS.
4. GULLIES OR OTHERWISE ERODED AREAS IN SEEDED AREAS SHALL BE RESTORED AS SOON AS POSSIBLE FOLLOWING OBSERVATION, USING EROSION CONTROL MESH TO STABILIZE AS REQUIRED.
5. FILL IN AND AROUND THE AREA OF THE NEW BUILDING ADDITION SHALL MEET THE SPECIFICATION FOR 'STRUCTURAL FILL'.
6. ALL EMBANKMENTS AND OTHER FILL SECTIONS SHALL BE CONSTRUCTED USING GRANULAR BORROW - A MIXTURE OF SAND AND GRAVEL MEETING MDOT SPECIFICATION 703.19 GRANULAR BORROW. SUITABLE SOIL BORROW MAY BE USED IN PLACE OF GRANULAR BORROW ONLY WHERE MOISTURE CONTENT CAN BE CONTROLLED TO MEET THE SPECIFIED COMPACTION.

INLET & OUTLET STRUCTURES:

1. INLET AND OUTLET STRUCTURES SHALL BE PRECAST CONCRETE, UNLESS OTHERWISE SPECIFIED. CONCRETE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 WHEEL LOADING AND SHALL BE PROVIDED WITH PROTECTIVE GRATES WITH A MAXIMUM OPENING SIZE OF FOUR INCHES UNLESS OTHERWISE SPECIFIED. CONCRETE STRUCTURES SHALL BE CONSTRUCTED ON A MINIMUM 12-INCH DEEP BASE OF 3/4-INCH COMPACTED CRUSHED STONE.
2. OUTLET PIPES SHALL BE PROVIDED WITH ANTI-SEEP COLLARS TO PREVENT PIPING OF RUNOFF ALONG STONE EMBEDMENT TRENCHES

DEWATERING NOTES:

1. THE CONTRACTOR SHALL EMPLOY A DEWATERING SYSTEM THAT ACHIEVES THE FOLLOWING FUNCTIONS DURING CONSTRUCTION:

   A. DEVELOP A SUBSTANTIALLY DRY AND STABLE SUBGRADE DURING EXECUTION OF THE WORK,

   B. PREVENT DAMAGE TO STRUCTURES ADJACENT TO THE WORK,

   C. RETAIN SEDIMENTS ON-SITE AND WITHIN THE WORK AREA. DEWATERING OPERATIONS SHALL BE SUSPENDED IF THE TURBIDITY OF DISCHARGES TO THE DOWNSTREAM DRAINAGE SYSTEM IS INCREASED ABOVE AMBIENT LEVELS.
2. FLOCCULANTS MAY BE USED TO CONTROL THE TURBIDITY OF DISCHARGE WATER. REFER TO THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS (2014, OR AS CURRENTLY REVISED) FOR RECOMMENDATIONS AND SPECIFICATIONS.
3. SURFACE WATER ENTERING THE CONSTRUCTION SITE SHALL BE INTERCEPTED AND DIVERTED AROUND THE WORK AREA THROUGH THE USE OF DIKES, CURB WALLS, DITCHES, SUMPS, PUMPING, OR OTHER APPROVED MEANS.
4. ANY ENFORCEMENT ACTIONS OR FINES RESULTING FROM THE IMPROPER DISCHARGE OF TURBID WATER AND SEDIMENT TO DOWNSTREAM AREAS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
5. DIRT BAGS AND TEMPORARY DEWATERING PONDS SHALL BE CONSTRUCTED AND MAINTAINED AS NEEDED TO CAPTURE AND TREAT PUMPATE FROM DEWATERED AREAS.

GEOTEXTILE & EROSION BLANKET NOTES:

1. EROSION CONTROL BLANKET FOR USE IN PONDS AND DRAINAGE CHANNELS SHALL BE 100% BIODEGRADABLE DOUBLE NET EROSION BLANKET WITH A 100% COCONUT FIBER MATRIX AND ORGANIC JUTE NETTING. EROSION CONTROL BLANKET FOR USE IN CHANNELS SHALL BE NORTH AMERICAN GREEN® BIONET® C125-BN ™. EAST COAST EROSION BLANKETS ECC-2B OR APPROVED EQUAL.
2. PERMANENT TURF REINFORCEMENT MAT FOR REINFORCED TURF SPILLWAYS AND EMERGENCY OVERFLOW WEIRS SHALL BE A UV-STABILIZED POLYPROPYLENE MAT WITH TWO LAYERS OF UV-STABILIZED NETTING. PERMANENT TURF REINFORCEMENT MAT SHALL BE NORTH AMERICAN GREEN® P300, EAST COAST EROSION BLANKETS ECP-2, OR APPROVED EQUAL.
3. GEOTEXTILE SEPARATION FABRIC SHALL BE A WOVEN SLIT FILM GEOTEXTILE WITH AN APPARENT OPENING SIZE OF 50 (US STANDARD SIEVE) (PER ASTM D4751) THAT MEETS THE REQUIREMENTS FOR A CLASS 2 SEPARATION GEOTEXTILE PER AASHTO M288.96. GEOTEXTILE SEPARATION FABRIC SHALL BE MIRAFI® 500X OR APPROVED EQUAL.
4. GEOTEXTILE DRAINAGE FABRIC SHALL BE A NONWOVEN GEOTEXTILE MANUFACTURED FOR USE IN SUBSURFACE DRAINAGE APPLICATIONS. THE MATERIAL SHALL HAVE AN APPARENT OPENING SIZE OF 70 (US STANDARD SIEVE) (PER ASTM D4751), A PERMITTIVITY OF 1.7/SEC OR GREATER (PER ASTM D4491) AND RETAIN A MINIMUM OF 70% STRENGTH AT 500 HOURS UV EXPOSURE (PER ASTM D4355). GEOTEXTILE DRAINAGE FABRIC SHALL BE MIRAFI® 140N, CONTECH® C-35NW, OR APPROVED EQUAL.

MANHOLE & CATCH BASIN NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4,000 PSI AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. MANHOLES MAY BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE OR CAST IN PLACE.
3. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPECIFICATION C-478.
4. ALL STORM AND SEWER MANHOLE COVERS SHALL BE SOLID AND HAVE ONE 7/8" DIAMETER DRILLED PICK HOLE LOCATED 8" FROM THE CENTER OF THE COVER.
5. ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER / DRAIN MANHOLE COVERS SHALL HAVE "DRAIN" CAST INTO THE COVER.
6. ALL MANHOLE RISERS SHALL BE ETHERIDGE 24" OR APPROVED EQUAL.
7. SEWER BRICK SHALL CONFORM TO ASTM SPECIFICATION DESIGNATION C-32-63, GRADE MA AND SA.
8. ALL SANITARY MANHOLES SHALL HAVE A WATERPROOFING COATING APPLIED TO THE EXTERIOR SURFACE.
9. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35.
10. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS WITHIN CITY RIGHTS-OF-WAY TO BE REMOVED SHALL BE SALVAGED BY THE CONTRACTOR , AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.
11. ALL CATCH BASIN OUTLETS SHALL BE INSTALLED WITH A CASCO TRAP.

UTILITY NOTES:

1. PROVIDE AND INSTALL MATERIALS NECESSARY TO COMPLETE UTILITY FEATURES AND DESIGN UNLESS OTHERWISE INDICATED.
2. ALL WORK SHALL MEET OR EXCEED STANDARDS OF THE CITY OF PORTLAND AND THE PORTLAND WATER DISTRICT.
3. ALL SEWER WORK SHALL BE IN ACCORDANCE WITH CITY OF PORTLAND STANDARD AND SHALL BE INSPECTED AND APPROVED BY THE CITY OF PORTLAND.
4. CONTRACTOR TO VERIFY EXISTING UTILITY CONNECTION POINTS PRIOR TO SUBMISSION OF BIDS AND INCLUDE ALL EXTRA WORK REQUIRED TO EXTEND UTILITIES AS REQUIRED.
5. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND HAVE BEEN DETERMINED BY SURFACE EVIDENCE AND/OR PREVIOUSLY GENERATED PLANS. NO GUARANTEE IS MADE THAT ALL UTILITIES ARE SHOWN OR WILL BE FOUND IN LOCATIONS INDICATED. THIS INFORMATION IS PROVIDED FOR REFERENCE AND THE CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES AND POINTS OF CONNECTION IN THE FIELD. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR AND RESTORATION OF ALL UTILITIES DISTURBED DURING CONSTRUCTION AT NO EXTRA EXPENSE TO THE OWNER.
6. THE OWNER, CONSTRUCTION MANAGER AND ARCHITECT SHALL BE NOTIFIED AT LEAST TWO DAYS PRIOR TO ANY INTERRUPTION TO ANY UTILITY SERVICE.
7. ADJUST ALL UTILITY STRUCTURE TOPS/RIMS TO MATCH PROPOSED GRADES UNLESS NOTED OTHERWISE.
8. LOCATIONS OF EXISTING SEWER LINES ARE BASED ON THE TOPOGRAPHIC SURVEY PRODUCED BY SURVEYWORKS, INC., DATED 2-14-2020.
9. EXISTING UTILITY CONNECTIONS TO THE BUILDINGS AT THE SITE ARE TAKEN FROM PREVIOUS PLANS AND A SURVEY OF SURFACE FEATURES. THE CONTRACTOR SHALL EXCAVATE TEST PITS IN AREAS ADJACENT TO EXISTING BUILDINGS AS NECESSARY TO VERIFY THE LOCATION, DEPTH AND SIZE OF EXISTING SERVICES. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT AND OWNER.
10. CONTRACTOR SHALL MAKE PROVISION FOR CONNECTING NEW UTILITY SERVICES TO THE PROJECT WITHOUT INTERRUPTION BY USE OF LIVE TAPPING AND OVER-PUMPING WHERE APPROPRIATE.

EMBANKMENT NOTES:

1. BASIN EMBANKMENTS SHALL BE CONSTRUCTED OF SUITABLE ON-SITE SOIL. COMPACTED IN MAXIMUM EIGHT INCH LIFTS TO 90% MAXIMUM DRY DENSITY. A MINIMUM OF SIX INCHES OF CLEAN SCREENED LOAM SHALL BE APPLIED TO FINISHED GRADE AND THE AREA SHALL BE IMMEDIATELY SEEDED AND STABILIZED WITH MULCH, HYDROSEED, OR EROSION BLANKET DEPENDING ON THE LEVEL OF EXPECTED INUNDATION (SEE EROSION CONTROL SHEETS).
2. EMBANKMENTS CONSTRUCTED ON EXISTING SOIL SLOPES STEEPER THAN 4H:1V SHOULD BE KEYED INTO THE EXISTING GROUND SURFACE WITH CONTINUOUS LEVEL BENCHES. EMBANKMENTS CONSTRUCTED ON EXISTING SOIL SLOPES FLATTER THAN 4H:1V SHALL HAVE A 10FT WIDE BENCH CUT INTO THE NATIVE SOIL AT THE TOE OF THE SLOPE FOR FILL EMBANKMENTS. A ONE FOOT (1') MINIMUM LAYER OF DRAINAGE COURSE MATERIAL SHALL BE PLACED OVER THE INITIAL BENCH PRIOR TO PLACING EMBANKMENT FILL. THE TOE BLANKET DRAIN SHALL BE CONSTRUCTED SUCH THAT GRAVITY DRAINAGE FORM THE BLANKET DRAIN OCCURS.

PLANTING NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL SUPPLY AND INSTALL ALL PLANTS IN SUFFICIENT QUANTITIES TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS. DISCREPANCIES BETWEEN QUANTITIES NOTED ON THE DRAWINGS AND THOSE GRAPHICALLY SHOWN SHALL BE REPORTED IMMEDIATELY TO THE LANDSCAPE ARCHITECT AND SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL REMUNERATION.
2. THE LANDSCAPE CONTRACTOR IS ADVISED THAT BELOW GROUND UTILITIES EXIST ON SITE, THE LOCATIONS OF WHICH SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF OPERATIONS (SEE GENERAL NOTES REGARDING DIGSAFE). SHOULD THE LOCATION OF ANY PROPOSED PLANTING CONFLICT WITH ANY UTILITY, THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY FOR DECISION.
3. ANY AND ALL PAVING, CURBING, UTILITIES, LAWNS, ETC,, DAMAGED AS A RESULT OF THE LANDSCAPE CONTRACTOR'S OPERATIONS SHALL BE REPLACED OR REPAIRED TO ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. LOCATIONS OF PROPOSED PLANTINGS AND BED LINES SHALL BE REVIEWED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
5. PLANTS SHALL BE PLACED NO CLOSER THAN ONE-HALF THE NOTED SPACING TO PAVEMENT EDGES, BED LINES, OR STRUCTURE FACES, UNLESS NOTED OR SHOWN OTHERWISE.
6. PLANT MASSES SHALL BE LAID OUT AND INSTALLED STARTING AT THE PRINCIPAL, FORM-DEFINING PERIMETER, THEN FILLING INWARD IN DOUBLE-ROW-STAGGERED FASHION, UNLESS NOTED OR SHOWN OTHERWISE.
7. ALL PLANTING BEDS INCLUDING TREE AND SHRUB PITS AS INDICATED SHALL RECEIVE 3" APPROVED CLEAN, UNIFORMLY GROUND OR SHREDDED PINE OR HEMLOCK BARK MULCH.
8. THE LANDSCAPE CONTRACTOR SHALL RELOCATE ANY PLANT ACCORDING TO THE DIRECTION OF THE LANDSCAPE ARCHITECT.
9. ALL PLANT MATERIALS CALLED FOR AND INSTALLED SHALL MEET OR EXCEED SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" (LATEST EDITION) AS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
10. ALL PLANTING BEDS SHALL BE DEFINED BY A NEAT, SHOVEL-CUT BED LINE. BED LINES SHALL BE TRUE TO FORM AS SHOWN ON THE DRAWINGS, CONSISTING OF SMOOTH CURVES AND SHARP LINES AND CORNERS.
11. IF, BECAUSE OF CULTURE REQUIREMENTS, AVAILABILITY, OR OTHER CIRCUMSTANCES, THE LANDSCAPE CONTRACTOR BELIEVES A PARTICULAR PLANT CALLED FOR IS INAPPROPRIATE, THE LANDSCAPE CONTRACTOR SHALL REPORT THE SITUATION IMMEDIATELY TO THE LANDSCAPE ARCHITECT FOR DECISION.
12. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL RECEIVE 6" LOAM AND SEED.

SITE ABBREVIATIONS

ALT	ALTERNATE	GALV	GALVANIZED	MISC.	MISCELLANEOUS	S	SLOPE
BOC	BOTTOM OF CURB	GC	GENERAL CONTRACTOR	NSD	NEW STORM DRAIN (LINE)	T & B	TOP & BOTTOM
BOW	BOTTOM OF WALL	HC	HANDICAPPED	NSS	NEW SANITARY SEWER (LINE)	TO	TOP OF
CIP	CAST-IN-PLACE	HMA	HOT MIX ASPHALT	NW	NEW WATER (LINE)	TOC	TOP OF CURB
℄	CENTER LINE	HP	HIGH POINT	O.C.	ON CENTER	TOW	TOP OF WALL
CLL	CONTRACT LIMITS LINE	ID	INSIDE DIAMETER	OD	OUTSIDE DIAMETER	TP	TEST PIT
ECB	EXISTING CATCH BASIN	LP	LOW POINT	R	RADIUS	TYP.	TYPICAL
FFE	FINISHED FLOOR ELEVATION	LT	LEFT	RE:	REFER (TO)	UG	UNDERGROUND
GA	GAUGE	MAX.	MAXIMUM	ROW	RIGHT-OF-WAY	W/	WITH
		MIN.	MINIMUM	RT	RIGHT	W/O	WITHOUT

SITE LEGEND

EXISTING		PROPOSED	
BODY OF WATER/STREAM		BOLLARD	
BOLLARD		BORING	
BORING		BRIDGE	
BRIDGE		BUILDING W/ DOOR	
BUILDING W/ DOOR		BUILDING CANOPY	
BUILDING CANOPY		CATCH BASIN	
CATCH BASIN		CHECKDAM - STONE	
CHECKDAM - STONE		COMMUNICATIONS LINE-OH	NTC NTC
COMMUNICATIONS LINE-OH	T T T	COMMUNICATIONS LINE-UG	NUC NUC
COMMUNICATIONS LINE-UG	C C C	CONCRETE PAD	
CONCRETE PAD		CULVERT	
CULVERT		CURB - BITUMINOUS	
CURB - BITUMINOUS		CURB - FLUSH	
CURB - SLOPED GRANITE		CURB - SLOPED GRANITE	
CURB - VERT GRANITE		CURB - VERT GRANITE	
CURB - SLIPFORM		CURB - SLIPFORM	
DETENTION POND		DETENTION POND	
DIRECTION OF FLOW		DIRECTION OF FLOW	
DITCH		DITCH	
DRAIN MANHOLE		DRAIN MANHOLE	
DRIP STRIP		DRIP STRIP	
EASEMENT		EASEMENT	
ELECTRIC MANHOLE		ELECTRIC MANHOLE	
ELECTRIC - OVERHEAD	OHW OHW	ELECTRIC - OVERHEAD	NOHE
ELECTRIC - UNDERGROUND	E E E	ELECTRIC - UNDERGROUND	NUGE
ELEVATION BOT OF CURB	+BOC	ELEVATION BOT OF CURB	+BOC
ELEVATION BOT OF STEP	+BOS	ELEVATION BOT OF STEP	+BOS
ELEVATION TOP OF CURB	+TOC	ELEVATION TOP OF CURB	+TOC
ELEVATION TOP OF STEP	+TOS	ELEVATION TOP OF STEP	+TOS
ELEVATION - SPOT	+100.0	ELEVATION - SPOT	+100.0
FENCE - CHAINLINK	X X X X	EMERGENCY CALL BOX	
FENCE - ORNAMENTAL		EROSION CONTROL MESH	
FIELD INLET		FENCE - CHAINLINK	X X X X
FIRE HYDRANT		FENCE - ORNAMENTAL	
FLAG POLE		FIRE HYDRANT	
FORCE MAIN PIPE	SFM SFM	FLAG POLE	
GAS & FUEL EQUIPMENT	GAS	FORCE MAIN PIPE	NSFM
GAS LINE	G G G	FOUNDATION DRAIN	NFND
GAS VALVE		GAS & FUEL EQUIPMENT	GAS
GENERATOR ON CONC PAD		GAS LINE	NGAS
GRAVEL DRIVE		GAS VALVE	
GUARDRAIL		GENERATOR ON CONC PAD	
HELIPAD		GRAVEL DRIVE	
HIGH POINT ELEVATION	+HP	GUARDRAIL	
IRRIGATION PIPING		HELIPAD	
LANDMARK SIGN		HIGH POINT ELEVATION	+HP
LIGHT - BOLLARD		IRRIGATION PIPING	
LIGHT POLE		LANDMARK SIGN	
LIGHT - SPOT		LIGHT - BOLLARD	
LOW POINT ELEVATION	+LP	LIGHT POLE	
MAJOR CONTOUR	100	LIGHT - SPOT/WALL	
MINOR CONTOUR	100	LIMIT OF WORK	
PARKING AREA-BITUMINOUS		LOW POINT ELEVATION	+LP
PAVEMENT STRIPING		MAJOR CONTOUR	100
PROPERTY LINE		MINOR CONTOUR	102
PROPERTY LINE - ABUTTER		PARKING AREA-BITUMINOUS	
		PAVEMENT STRIPING	
RETAINING WALL		PROPERTY LINE	
RIPRAP		RETAINING WALL	
ROADWAY		RIPRAP	
ROADWAY CENTER LINE		ROADWAY	
SANITARY SEWER PIPE	SS SS	ROADWAY CENTER LINE	
SANITARY SEWER MANHOLE		SANITARY SEWER MANHOLE	
SETBACK		SANITARY SEWER PIPE	NSS NSS
SIGN		SETBACK	
SIGN - TWO-SIDED		SIGN	
SILT FENCE	SF SF	SIGN - TWO-SIDED	
SLOPE NOTATION	S = .01	SILT FENCE	SF SF
SOIL TYPE BOUNDARY		SLOPE NOTATION	S = .01
SPRINKLER		SPRINKLER	
STONE WALL		STONE WALL	
STORM DRAIN PIPE	SD SD	STORM DRAIN PIPE	NSD NSD
TELEPHONE EQUIPMENT	TEL	TELEPHONE EQUIPMENT	TEL
TEST PIT	TP	TEST PIT	
TRAFFIC ARM & SIGNAL		TRAFFIC ARM & SIGNAL	
TRANSFORMER ON CONC	T	TRANSFORMER ON CONC	T
TURF		TURF	
UNDERDRAIN PIPE	UD UD UD UD UD	UNDERDRAIN PIPE	UD UD UD UD UD
UTILITY POLE		UTILITY POLE	
WALKWAY - BITUMINOUS		WALKWAY - BITUMINOUS	
WALKWAY - BRICK/COBBLE		WALKWAY - BRICK/COBBLE	
WALKWAY - CONCRETE		WALKWAY - CONCRETE	
WALL - ORNAMENTAL		WALL - ORNAMENTAL	
WATER GATE VALVE		WATER GATE VALVE	
WATER PIPE (DOMESTIC)	W W W	WATER PIPE (DOMESTIC)	NW NW
WATER PIPE (FIRE)	F	WATER PIPE (FIRE)	NFS NFS
WATER SHUTOFF		WATER SHUTOFF	
WATERSHED BOUNDARY		WELL	W
WETLAND BOUNDARY			

NOTE:
THIS LEGEND IS FOR REFERENCE ONLY AND APPLIES ONLY TO THE CIVIL/SITE LAYOUT DRAWINGS. NOT ALL ITEMS SHOWN HEREIN MAY APPEAR ON THE DRAWINGS, OR BE INCORPORATED IN THE DESIGN.

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20
CURRENT ISSUE STATUS:

STATE OF MAINE · JEFFREY · CETO · No. 6418 · LICENSED PROFESSIONAL ENGINEER

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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

SITE NOTES & LEGENDS

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL	C-001	
DRAWN BY:	WSM		
SMRT FILE:	C-001-19206	SHEET No.	

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DEMOLITION LEGEND:

- MATERIALS TO BE REMOVED
- LIMIT OF BITUMINOUS REMOVAL
- UNDERGROUND PIPING TO BE REMOVED

DEMOLITION NOTES:

1. ALL PRE-EXISTING STRUCTURES WITHIN THE PROPOSED BUILDING FOOTPRINT, UNDER AREAS PROPOSED FOR PAVING, AND ALONG PROPOSED UTILITY ROUTES ARE TO BE COMPLETELY REMOVED AND REPLACED WITH COMPACTED STRUCTURAL FILL.
2. MAINTAIN TWO-WAY ACCESS THROUGH CONSTRUCTION FOR MAINTENANCE DRIVE.
3. FENCE NOTED TO BE REMOVED SHALL BE SALVAGED.
4. UTILITY POLES AND LIGHTS NOTED FOR REMOVAL SHALL BE SALVAGED.
5. ALL CONFLICTING ITEMS WITHIN THE DEVELOPMENT AREA NOT OTHERWISE NOTED SHALL BE REMOVED.
6. IN PAVEMENT REMOVAL AREAS EXISTING SURFACE SHALL BE GROUND, REMOVED AND STOCKPILED FOR LATER USE AS SUITABLE FILL MATERIAL.
7. ALL MANHOLE AND CATCH BASIN FRAMES AND COVERS TO BE REMOVED SHALL BE SALVAGED FOR FUTURE USE.

DEMOLITION KEY:

1. REMOVE BUILDING - SEE SHEET CD102 FOR DETAILS
2. REMOVE PAVEMENT TO LIMITS SHOWN
3. REMOVE WALKWAY PAVEMENT TO LIMITS SHOWN
4. REMOVE EXISTING CURBING
5. REMOVE SIGN & STOCKPILE FOR REINSTALLATION
6. PROTECT EXISTING ELECTRICAL LINES & STRUCTURES TO REMAIN
7. PROTECT EXISTING STRUCTURE TO REMAIN
8. REMOVE GUARDRAIL
9. REMOVE SEWER STRUCTURE
10. REMOVE STORM STRUCTURE & CONNECTED PIPING
11. PROTECT HYDRANT TO REMAIN
12. REMOVE BOLLARD
13. REMOVE EXISTING CALL BOX & LIGHT & SALVAGE FOR OWNER
14. REMOVE EXISTING BICYCLE REPAIR STATION & SALVAGE FOR OWNER
15. DISCONNECT GAS METER
16. REMOVE UTILITY POLE IN CONJUNCTION W/ CMP
17. PROTECT BUS SHELTER & BOLLARDS
18. REMOVE ALL EXISTING RAISED PLANTING BEDS
19. MARK DOORS "EMERGENCY EGRESS ONLY"
20. REMOVE CONCRETE PAVEMENT TO LIMITS SHOWN

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REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH:

JEFFREY J. CETO No. 6418 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

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PORTLAND, MAINE

EXISTING CONDITIONS & DEMOLITION PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD
A/E OF RECORD:	JTA
JOB CAPTAIN:	SDL
DRAWN BY:	WSM
SMRT FILE:	CD101-19206

PROJECT NO: 19206

CD101

SHEET No.

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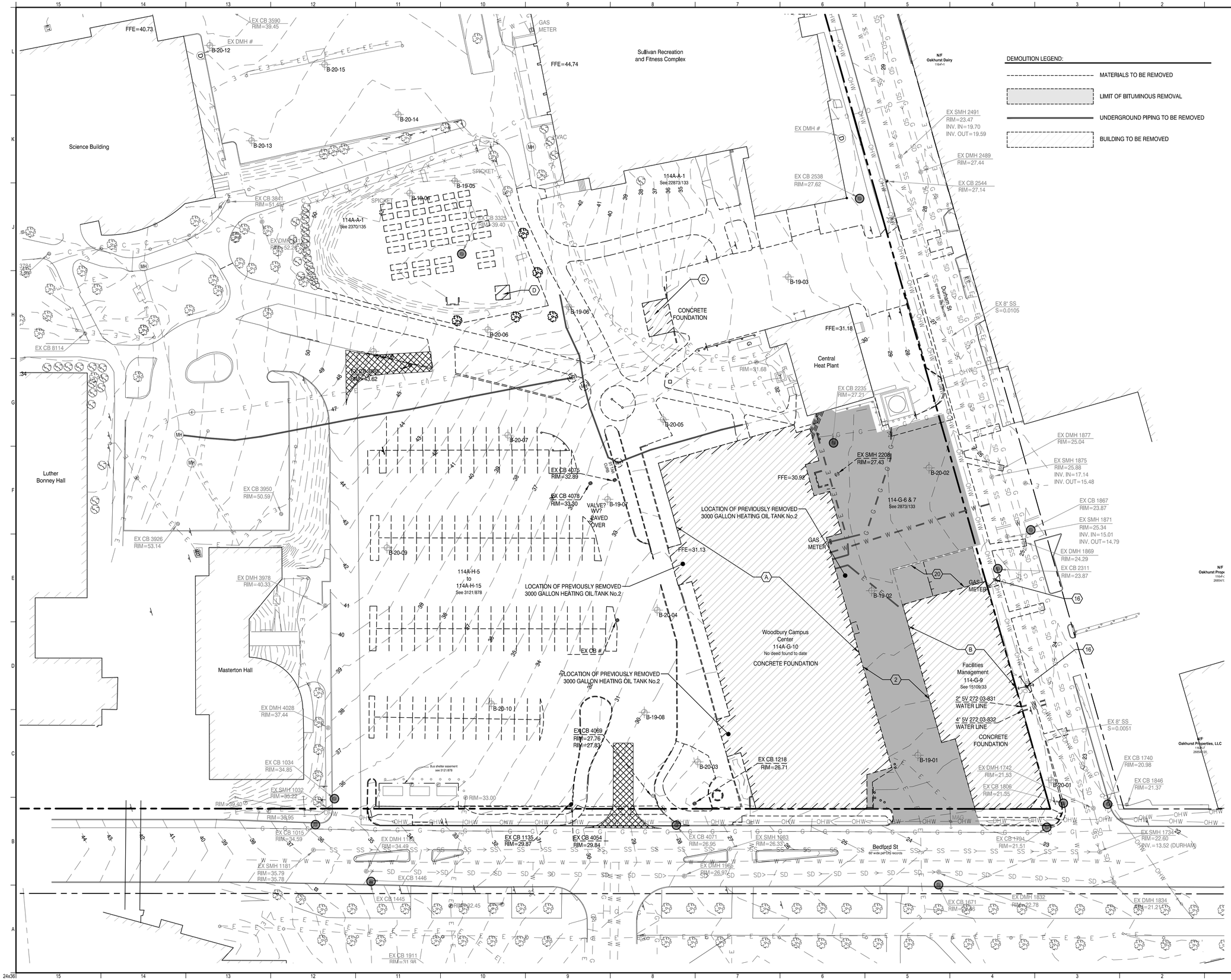

DEMOLITION NOTES:

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DEMOLITION LEGEND:

- MATERIALS TO BE REMOVED
- LIMIT OF BITUMINOUS REMOVAL
- UNDERGROUND PIPING TO BE REMOVED
- BUILDING TO BE REMOVED

DEMOLITION KEY:

- (A) #35 BEDFORD STREET; BUILDING DESCRIPTION: WOODBURY CAMPUS CENTER
- (B) #25 BEDFORD STREET: BUILDING DESCRIPTION: FACILITIES MANAGMENT
- (C) SAND/SALT SHED; BUILDING DESCRIPTION:
- (D) SHED

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PORTLAND, MAINE

BUILDING DEMOLITION PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		CD102
DRAWN BY:	WSM		
SMRT FILE:	CD102-19206	SHEET No.	

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CURB LEGEND

- VC — VERTICAL GRANITE CURB — D1 / CP501
- GT — GRANITE TIPDOWN CURB
- VGT — VERTICAL GRANITE TRANSITION CURB
- F — FLUSH CURB — D1 / CP501 SIM.

SULLIVAN RECREATION AND FITNESS COMPLEX
FFE 44.74

OAKHURST DAIRY

FUTURE PARKING GARAGE

SOUTHWORTH PLANETARIUM

LUTHER BONNEY HALL

MASTERTON HALL

CENTRAL HEAT PLANT
FFE 31.18

STUDENT SUCCESS CENTER
FFE 37.00

RESIDENCE HALL
FFE 25.66

RESIDENCE HALL
FFE 25.66

DURHAM STREET

BEDFORD STREET

MATCH EXISTING

ALIGN

J1 / CP501 BITUMINOUS WALK

D8 / CP501 CONCRETE APRON

CONCRETE RAMP / CP501

R 30.0'

R 15.0'

R 100.0'

R 5.0' (TYP.)

R 18.0'

R 10.0'

R 25.0'

R 5.0'

12.0'

21.6'

18.0' TYP.

9.0' TYP.

8.0'

10.0'

BOLLARD / CP502

BOLLARD (TYP. OF 4) / CP502

BOLLARD (TYP. OF 3) / CP502

BOLLARD (TYP. OF 7) / CP502

7.0' (TYP.)

40.0'

48.0'

54.4'

22.0' (TYP.)

C.I.P. CONCRETE RETAINING WALL W/ GUARDRAIL, RE: CG101 TYP. @ RAMP

LOADING DOCK, RE: ARCH

CONCRETE DOOR PAD, RE: STRUCTURAL (TYP.)

CONCRETE WALK W/ HANDRAIL — F1 / CP502 / CP501

BUILDING CONNECTOR, RE: ARCH

BIKE RACK (14)

R 3.0' TYP. THIS SIDE OF WALK

CONCRETE STAIRS — A1 / CP502

GATED ENTRANCE

GRANITE STEPS

DECK, RE: ARCH

CANOPY COLUMN, RE: ARCH (TYP.)

FUTURE STAIRS

C.I.P. CONCRETE RETAINING WALL, RE: CG101

CONCRETE WALK (TYP.) — F1 / CP501

RETAINING WALL, RE: CG101 (C.I.P. CONCRETE)

45.7'

24.0'

20.0' EXISTING DRIVE

80.0°

USM STANDARD SITE SIGN

BIKE RACK (14)

C.I.P. CONCRETE RETAINING WALL, RE: CG101

BIKE RACK (5)

CURB RAMP — H12 / CP501

A5 / CP501 STANDARD PAVEMENT MARKINGS PEDESTRIAN CROSSWALK (TYP.)

REPAIR PAVEMENT TO MATCH EXISTING

STANDARD PAVEMENT MARKINGS STRIPED AREA & ADA PARKING, (TYP.) — A5 / CP501

STANDARD PAVEMENT MARKINGS SINGLE WHITE LINE (TYP.) — A5 / CP501

BITUMINOUS PAVEMENT — A1 / CP501

REPAIR DURHAM ST. PAVEMENT TO MATCH EXISTING

REPAIR PAVEMENT TO MATCH EXISTING

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SITE LAYOUT PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	CP101-19206	SHEET No.	CP101

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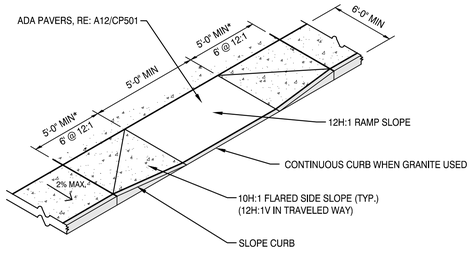
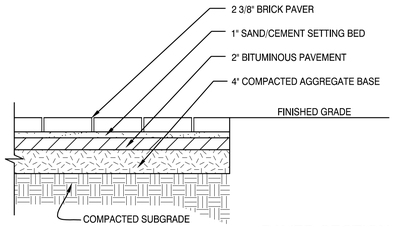


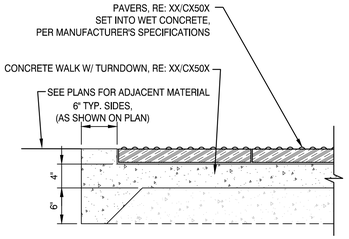
NOTE:

1. FLARE LENGTH TO BE 6' WHEN IN A WALKWAY.

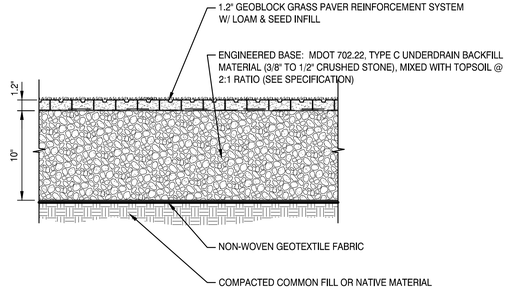
CURB RAMP H12
NOT TO SCALE



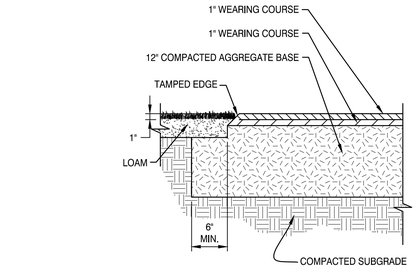
PAVER SECTION K8
1" = 1'-0"



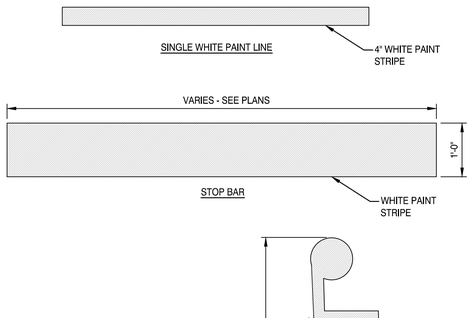
ADA PAVER SECTION H8
1" = 1'-0"

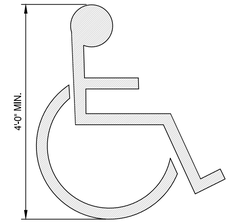


REINFORCED TURF J5
1" = 1'-0"

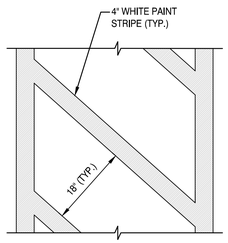


BITUMINOUS WALK J1
1" = 1'-0"



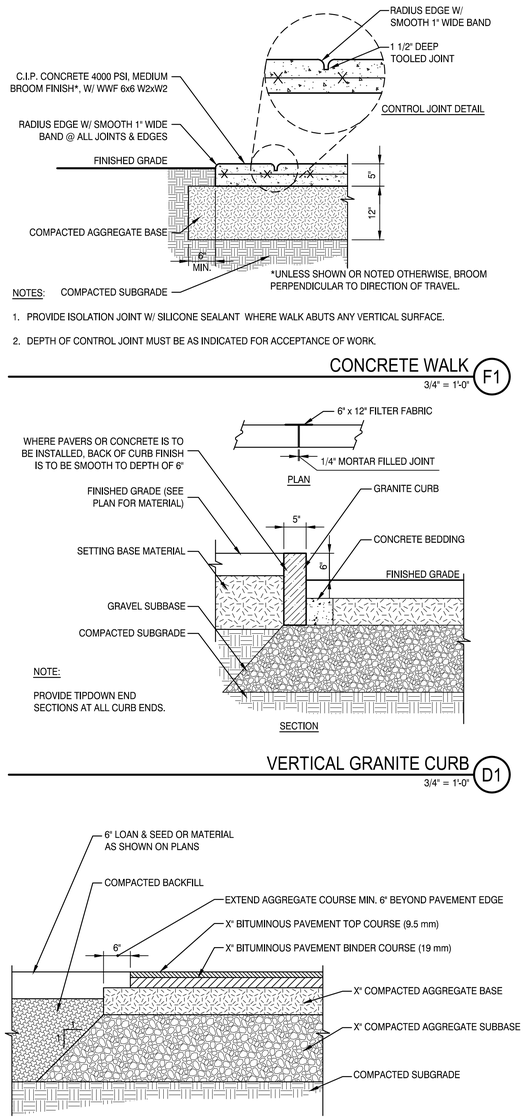


DISABILITY SYMBOL



STRIPED AREA

STANDARD PAVEMENT MARKINGS A5
3/4" = 1'-0"

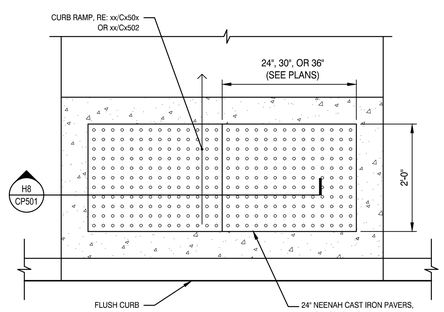


NOTES:

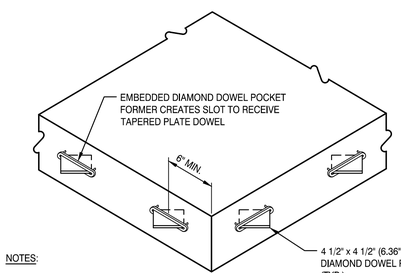
1. PROVIDE ISOLATION JOINT W/ SILICONE SEALANT WHERE WALK ABUTS ANY VERTICAL SURFACE.
2. DEPTH OF CONTROL JOINT MUST BE AS INDICATED FOR ACCEPTANCE OF WORK.

CONCRETE WALK F1
3/4" = 1'-0"

VERTICAL GRANITE CURB D1
3/4" = 1'-0"



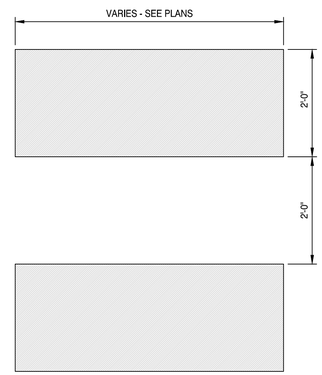
ADA PAVER PLAN A12
3/4" = 1'-0"



NOTES:

1. DIAMOND DOWEL SHALL BE 3/8" STAINLESS STEEL PLATES.
2. DIAMOND DOWEL TO BE PLACED @ 18" O.C.
3. DIAMOND DOWEL SYSTEM AS MANUFACTURED BY PNA CONSTRUCTION TECHNOLOGIES, INC. (800) 542-0214.
4. DIAMOND DOWEL SYSTEM TO BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDATIONS.

DIAMOND DOWEL CONCRETE CONNECTION A8
NOT TO SCALE



PEDESTRIAN CROSSWALK

BITUMINOUS PAVEMENT A1
3/4" = 1'-0"

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SITE LAYOUT DETAILS

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SCALE:

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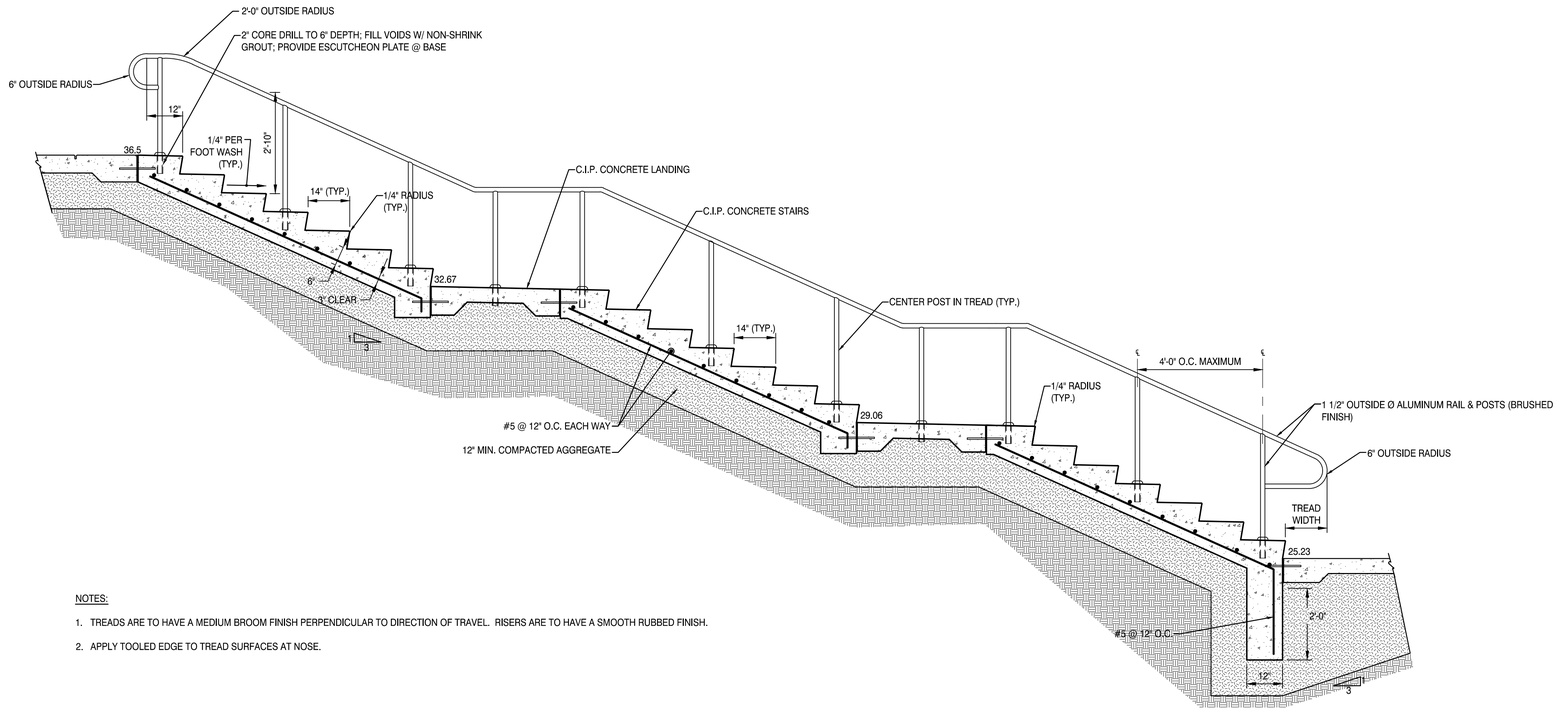
BOLLARD A12

1" = 1'-0"



NOTES:

1. TREADS ARE TO HAVE A MEDIUM BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL. RISERS ARE TO HAVE A SMOOTH RUBBED FINISH.
2. APPLY TOOLED EDGE TO TREAD SURFACES AT NOSE.

CONCRETE STAIRS A1

1/2" = 1'-0"

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

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7-24-20

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STATE OF MAINE JEFFREY T. CETO No. 8418 LICENSED PROFESSIONAL ENGINEER

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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

SITE LAYOUT DETAILS

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		CP502
DRAWN BY:	WSM		
SMRT FILE:	CP502-19206	SHEET No.	

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24X36

GENERAL NOTES

1. THE SCOPE OF SITE WORK FOR THIS PROJECT INCLUDES PROTECTION OF EXISTING STRUCTURES AND UTILITIES, AND REINSTATEMENT OF DISTURBED AREAS OF THE SITE TO MATCH EXISTING CONDITIONS. THE EXISTING CONDITIONS SHOWN ON THE PROJECT DRAWINGS ARE TAKEN FROM RECORD DRAWINGS AND HISTORICAL INFORMATION. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SITE CONDITIONS PRIOR TO THE START OF WORK AND CONTACT THE PROJECT ARCHITECT IMMEDIATELY IF DISCREPANCIES ARE FOUND.
2. EXISTING UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM HISTORICAL RECORDS AND PREVIOUS DESIGN DRAWINGS. NO GUARANTEE IS MADE THAT THE UTILITIES SHOWN WILL BE FOUND IN THE LOCATIONS INDICATED, OR THAT THE INFORMATION SHOWN IS COMPLETE. INFORMATION ON EXISTING UTILITY LOCATIONS IS PROVIDED FOR REFERENCE ONLY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING EXISTING UTILITY LOCATIONS AND DEPTHS AND COORDINATING THE WORK ACCORDINGLY.
3. THE CONTRACTOR SHALL UNDERTAKE TEST PITS AT THE SITE AND ENGAGE PRIVATE UTILITY DETECTION SERVICE, AS NECESSARY, TO ACCURATELY IDENTIFY UTILITIES IN ORDER TO EFFICIENTLY PLAN AND COMPLETE THE WORK.
4. THE CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITIES ADJACENT TO THE WORK. ANY DAMAGE TO EXISTING STRUCTURES, ROADS, SIDEWALKS, UTILITIES, OR OTHER SITE FEATURES CAUSED BY THE WORK SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.
5. ANY UTILITY REPAIRS OR RECONFIGURATION REQUIRED AS PART OF THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION.
6. TEMPORARY WORKS, SUPPORT AND PROTECTION OF STRUCTURES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE COSTS SHALL BE CONSIDERED INCIDENTAL TO THE OVERALL PROJECT SUM.
7. ALL WORK SHALL BE UNDERTAKEN IN STRICT ACCORDANCE WITH LOCAL, STATE AND FEDERAL SAFETY STANDARDS.
8. OPEN EXCAVATIONS AND WORK AREAS SHALL BE CLEARLY DELINEATED AND FENCED, AS NECESSARY TO PREVENT UNAUTHORIZED ACCESS
9. DRIVEWAYS, WALKWAYS AND ENTRANCES SERVING PREMISES SHALL BE KEPT CLEAR AND AVAILABLE TO OWNER, OWNER'S EMPLOYEES, AND EMERGENCY VEHICLES, AS NECESSARY TO MAINTAIN THE FUNCTION OF THE FACILITY. COORDINATE ALL WORK WITH OWNER TO ENSURE THAT ADEQUATE ACCESS AND CIRCULATION IS MAINTAINED AT ALL TIMES.
10. DE-WATERING, IF NECESSARY, SHALL BE UNDERTAKEN IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL STANDARDS. NO DISCHARGE OF SEDIMENT LADEN RUNOFF TO SURFACE WATERS, OR THE PIPED STORM DRAIN SYSTEM AT THE SITE SHALL BE ALLOWED.
11. ALL DISTURBED PAVEMENT AREAS, ROADS AND SIDEWALKS SHALL BE REINSTATED TO MATCH EXISTING GRADES, MATERIALS AND DEPTHS.
12. EXISTING PAVEMENT SHALL BE SAW-CUT AT LEAST TWELVE INCHES INTO SOUND MATERIAL TO PROVIDE A CLEAN, STRAIGHT EDGE BETWEEN EXISTING SOUND SURFACE MATERIAL AND THE REPAIRED AREA.
13. A SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN REPAIR WORKS AND EXISTING PAVEMENT. ALL REINSTATED AREAS SHALL BE GRADED TO PITCH UNIFORMLY TO ENSURE POSITIVE DRAINAGE.

LAYOUT NOTES:

1. DO NOT SCALE THE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY OMISSIONS IN DIMENSIONING SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT FOR DECISION. ANY DISCREPANCIES BETWEEN DRAWINGS, DETAILS, NOTES, AND SPECIFICATIONS SHALL IMMEDIATELY BE REPORTED TO THE ARCHITECT FOR FURTHER DIRECTION AND RESOLUTION BEFORE ANY ADDITIONAL WORK PROCEEDS.
2. ALL ANGLES ARE 90 DEGREES UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS FROM BUILDING ARE TO FACE OF BUILDING FOUNDATION. ALL DIMENSIONS FROM CURBS ARE TO FACE OF CURB.
4. PROVIDE A SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING WORK.
5. CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND LOCAL UTILITY COMPANIES TO VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION.
6. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR WORK SHOWN ON THESE PLANS.
7. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS AND MEET OR EXCEED CITY OF PORTLAND STANDARDS.
8. PROVIDE TAPERED END SECTIONS AT ALL CURB ENDS.
9. EXISTING CONDITIONS AND TOPOGRAPHIC DATA ARE BASED UPON TOPOGRAPHIC SURVEY PREPARED BY SURVEYWORKS, INC., TURNER, MAINE, AND DATED 2-14-2020.

GRADING NOTES:

1. SOIL DISTURBANCE IS TO BE KEPT TO A MINIMUM AND ALL DISTURBED AREAS SHALL BE STABILIZED (WITH PERMANENT OR TEMPORARY MEASURES) AS QUICKLY AS POSSIBLE.
2. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL BE LOAMED AND SEEDED (6" DEPTH).
3. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED ON A REGULAR BASIS AND AS REQUIRED AFTER STORM EVENTS.
4. GULLIES OR OTHERWISE ERODED AREAS IN SEEDED AREAS SHALL BE RESTORED AS SOON AS POSSIBLE FOLLOWING OBSERVATION, USING EROSION CONTROL MESH TO STABILIZE AS REQUIRED.
5. FILL IN AND AROUND THE AREA OF THE NEW BUILDING ADDITION SHALL MEET THE SPECIFICATION FOR 'STRUCTURAL FILL'.
6. ALL EMBANKMENTS AND OTHER FILL SECTIONS SHALL BE CONSTRUCTED USING GRANULAR BORROW - A MIXTURE OF SAND AND GRAVEL MEETING MDOT SPECIFICATION 703.19 GRANULAR BORROW. SUITABLE SOIL BORROW MAY BE USED IN PLACE OF GRANULAR BORROW ONLY WHERE MOISTURE CONTENT CAN BE CONTROLLED TO MEET THE SPECIFIED COMPACTION.

INLET & OUTLET STRUCTURES:

1. INLET AND OUTLET STRUCTURES SHALL BE PRECAST CONCRETE, UNLESS OTHERWISE SPECIFIED. CONCRETE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 WHEEL LOADING AND SHALL BE PROVIDED WITH PROTECTIVE GRATES WITH A MAXIMUM OPENING SIZE OF FOUR INCHES UNLESS OTHERWISE SPECIFIED. CONCRETE STRUCTURES SHALL BE CONSTRUCTED ON A MINIMUM 12-INCH DEEP BASE OF 3/4-INCH COMPACTED CRUSHED STONE.
2. OUTLET PIPES SHALL BE PROVIDED WITH ANTI-SEEP COLLARS TO PREVENT PIPING OF RUNOFF ALONG STONE EMBEDMENT TRENCHES

DEWATERING NOTES:

1. THE CONTRACTOR SHALL EMPLOY A DEWATERING SYSTEM THAT ACHIEVES THE FOLLOWING FUNCTIONS DURING CONSTRUCTION:

   A. DEVELOP A SUBSTANTIALLY DRY AND STABLE SUBGRADE DURING EXECUTION OF THE WORK,

   B. PREVENT DAMAGE TO STRUCTURES ADJACENT TO THE WORK,

   C. RETAIN SEDIMENTS ON-SITE AND WITHIN THE WORK AREA. DEWATERING OPERATIONS SHALL BE SUSPENDED IF THE TURBIDITY OF DISCHARGES TO THE DOWNSTREAM DRAINAGE SYSTEM IS INCREASED ABOVE AMBIENT LEVELS.
2. FLOCCULANTS MAY BE USED TO CONTROL THE TURBIDITY OF DISCHARGE WATER. REFER TO THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS (2014, OR AS CURRENTLY REVISED) FOR RECOMMENDATIONS AND SPECIFICATIONS.
3. SURFACE WATER ENTERING THE CONSTRUCTION SITE SHALL BE INTERCEPTED AND DIVERTED AROUND THE WORK AREA THROUGH THE USE OF DIKES, CURB WALLS, DITCHES, SUMPS, PUMPING, OR OTHER APPROVED MEANS.
4. ANY ENFORCEMENT ACTIONS OR FINES RESULTING FROM THE IMPROPER DISCHARGE OF TURBID WATER AND SEDIMENT TO DOWNSTREAM AREAS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
5. DIRT BAGS AND TEMPORARY DEWATERING PONDS SHALL BE CONSTRUCTED AND MAINTAINED AS NEEDED TO CAPTURE AND TREAT PUMPATE FROM DEWATERED AREAS.

GEOTEXTILE & EROSION BLANKET NOTES:

1. EROSION CONTROL BLANKET FOR USE IN PONDS AND DRAINAGE CHANNELS SHALL BE 100% BIODEGRADABLE DOUBLE NET EROSION BLANKET WITH A 100% COCONUT FIBER MATRIX AND ORGANIC JUTE NETTING. EROSION CONTROL BLANKET FOR USE IN CHANNELS SHALL BE NORTH AMERICAN GREEN® BIONET® C125-BN ™. EAST COAST EROSION BLANKETS ECC-2B OR APPROVED EQUAL.
2. PERMANENT TURF REINFORCEMENT MAT FOR REINFORCED TURF SPILLWAYS AND EMERGENCY OVERFLOW WEIRS SHALL BE A UV-STABILIZED POLYPROPYLENE MAT WITH TWO LAYERS OF UV-STABILIZED NETTING. PERMANENT TURF REINFORCEMENT MAT SHALL BE NORTH AMERICAN GREEN® P300, EAST COAST EROSION BLANKETS ECP-2, OR APPROVED EQUAL.
3. GEOTEXTILE SEPARATION FABRIC SHALL BE A WOVEN SLIT FILM GEOTEXTILE WITH AN APPARENT OPENING SIZE OF 50 (US STANDARD SIEVE) (PER ASTM D4751) THAT MEETS THE REQUIREMENTS FOR A CLASS 2 SEPARATION GEOTEXTILE PER AASHTO M288.96. GEOTEXTILE SEPARATION FABRIC SHALL BE MIRAFI® 500X OR APPROVED EQUAL.
4. GEOTEXTILE DRAINAGE FABRIC SHALL BE A NONWOVEN GEOTEXTILE MANUFACTURED FOR USE IN SUBSURFACE DRAINAGE APPLICATIONS. THE MATERIAL SHALL HAVE AN APPARENT OPENING SIZE OF 70 (US STANDARD SIEVE) (PER ASTM D4751), A PERMITTIVITY OF 1.7/SEC OR GREATER (PER ASTM D4491) AND RETAIN A MINIMUM OF 70% STRENGTH AT 500 HOURS UV EXPOSURE (PER ASTM D4355). GEOTEXTILE DRAINAGE FABRIC SHALL BE MIRAFI® 140N, CONTECH® C-35NW, OR APPROVED EQUAL.

MANHOLE & CATCH BASIN NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4,000 PSI AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. MANHOLES MAY BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE OR CAST IN PLACE.
3. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPECIFICATION C-478.
4. ALL STORM AND SEWER MANHOLE COVERS SHALL BE SOLID AND HAVE ONE 7/8" DIAMETER DRILLED PICK HOLE LOCATED 8" FROM THE CENTER OF THE COVER.
5. ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER / DRAIN MANHOLE COVERS SHALL HAVE "DRAIN" CAST INTO THE COVER.
6. ALL MANHOLE RISERS SHALL BE ETHERIDGE 24" OR APPROVED EQUAL.
7. SEWER BRICK SHALL CONFORM TO ASTM SPECIFICATION DESIGNATION C-32-63, GRADE MA AND SA.
8. ALL SANITARY MANHOLES SHALL HAVE A WATERPROOFING COATING APPLIED TO THE EXTERIOR SURFACE.
9. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35.
10. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS WITHIN CITY RIGHTS-OF-WAY TO BE REMOVED SHALL BE SALVAGED BY THE CONTRACTOR , AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.
11. ALL CATCH BASIN OUTLETS SHALL BE INSTALLED WITH A CASCO TRAP.

UTILITY NOTES:

1. PROVIDE AND INSTALL MATERIALS NECESSARY TO COMPLETE UTILITY FEATURES AND DESIGN UNLESS OTHERWISE INDICATED.
2. ALL WORK SHALL MEET OR EXCEED STANDARDS OF THE CITY OF PORTLAND AND THE PORTLAND WATER DISTRICT.
3. ALL SEWER WORK SHALL BE IN ACCORDANCE WITH CITY OF PORTLAND STANDARD AND SHALL BE INSPECTED AND APPROVED BY THE CITY OF PORTLAND.
4. CONTRACTOR TO VERIFY EXISTING UTILITY CONNECTION POINTS PRIOR TO SUBMISSION OF BIDS AND INCLUDE ALL EXTRA WORK REQUIRED TO EXTEND UTILITIES AS REQUIRED.
5. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND HAVE BEEN DETERMINED BY SURFACE EVIDENCE AND/OR PREVIOUSLY GENERATED PLANS. NO GUARANTEE IS MADE THAT ALL UTILITIES ARE SHOWN OR WILL BE FOUND IN LOCATIONS INDICATED. THIS INFORMATION IS PROVIDED FOR REFERENCE AND THE CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES AND POINTS OF CONNECTION IN THE FIELD. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR AND RESTORATION OF ALL UTILITIES DISTURBED DURING CONSTRUCTION AT NO EXTRA EXPENSE TO THE OWNER.
6. THE OWNER, CONSTRUCTION MANAGER AND ARCHITECT SHALL BE NOTIFIED AT LEAST TWO DAYS PRIOR TO ANY INTERRUPTION TO ANY UTILITY SERVICE.
7. ADJUST ALL UTILITY STRUCTURE TOPS/RIMS TO MATCH PROPOSED GRADES UNLESS NOTED OTHERWISE.
8. LOCATIONS OF EXISTING SEWER LINES ARE BASED ON THE TOPOGRAPHIC SURVEY PRODUCED BY SURVEYWORKS, INC., DATED 2-14-2020.
9. EXISTING UTILITY CONNECTIONS TO THE BUILDINGS AT THE SITE ARE TAKEN FROM PREVIOUS PLANS AND A SURVEY OF SURFACE FEATURES. THE CONTRACTOR SHALL EXCAVATE TEST PITS IN AREAS ADJACENT TO EXISTING BUILDINGS AS NECESSARY TO VERIFY THE LOCATION, DEPTH AND SIZE OF EXISTING SERVICES. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT AND OWNER.
10. CONTRACTOR SHALL MAKE PROVISION FOR CONNECTING NEW UTILITY SERVICES TO THE PROJECT WITHOUT INTERRUPTION BY USE OF LIVE TAPPING AND OVER-PUMPING WHERE APPROPRIATE.

EMBANKMENT NOTES:

1. BASIN EMBANKMENTS SHALL BE CONSTRUCTED OF SUITABLE ON-SITE SOIL. COMPACTED IN MAXIMUM EIGHT INCH LIFTS TO 90% MAXIMUM DRY DENSITY. A MINIMUM OF SIX INCHES OF CLEAN SCREENED LOAM SHALL BE APPLIED TO FINISHED GRADE AND THE AREA SHALL BE IMMEDIATELY SEEDED AND STABILIZED WITH MULCH, HYDROSEED, OR EROSION BLANKET DEPENDING ON THE LEVEL OF EXPECTED INUNDATION (SEE EROSION CONTROL SHEETS).
2. EMBANKMENTS CONSTRUCTED ON EXISTING SOIL SLOPES STEEPER THAN 4H:1V SHOULD BE KEYED INTO THE EXISTING GROUND SURFACE WITH CONTINUOUS LEVEL BENCHES. EMBANKMENTS CONSTRUCTED ON EXISTING SOIL SLOPES FLATTER THAN 4H:1V SHALL HAVE A 10FT WIDE BENCH CUT INTO THE NATIVE SOIL AT THE TOE OF THE SLOPE FOR FILL EMBANKMENTS. A ONE FOOT (1') MINIMUM LAYER OF DRAINAGE COURSE MATERIAL SHALL BE PLACED OVER THE INITIAL BENCH PRIOR TO PLACING EMBANKMENT FILL. THE TOE BLANKET DRAIN SHALL BE CONSTRUCTED SUCH THAT GRAVITY DRAINAGE FORM THE BLANKET DRAIN OCCURS.

PLANTING NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL SUPPLY AND INSTALL ALL PLANTS IN SUFFICIENT QUANTITIES TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS. DISCREPANCIES BETWEEN QUANTITIES NOTED ON THE DRAWINGS AND THOSE GRAPHICALLY SHOWN SHALL BE REPORTED IMMEDIATELY TO THE LANDSCAPE ARCHITECT AND SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL REMUNERATION.
2. THE LANDSCAPE CONTRACTOR IS ADVISED THAT BELOW GROUND UTILITIES EXIST ON SITE, THE LOCATIONS OF WHICH SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF OPERATIONS (SEE GENERAL NOTES REGARDING DIGSAFE). SHOULD THE LOCATION OF ANY PROPOSED PLANTING CONFLICT WITH ANY UTILITY, THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY FOR DECISION.
3. ANY AND ALL PAVING, CURBING, UTILITIES, LAWNS, ETC,, DAMAGED AS A RESULT OF THE LANDSCAPE CONTRACTOR'S OPERATIONS SHALL BE REPLACED OR REPAIRED TO ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. LOCATIONS OF PROPOSED PLANTINGS AND BED LINES SHALL BE REVIEWED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
5. PLANTS SHALL BE PLACED NO CLOSER THAN ONE-HALF THE NOTED SPACING TO PAVEMENT EDGES, BED LINES, OR STRUCTURE FACES, UNLESS NOTED OR SHOWN OTHERWISE.
6. PLANT MASSES SHALL BE LAID OUT AND INSTALLED STARTING AT THE PRINCIPAL, FORM-DEFINING PERIMETER, THEN FILLING INWARD IN DOUBLE-ROW-STAGGERED FASHION, UNLESS NOTED OR SHOWN OTHERWISE.
7. ALL PLANTING BEDS INCLUDING TREE AND SHRUB PITS AS INDICATED SHALL RECEIVE 3" APPROVED CLEAN, UNIFORMLY GROUND OR SHREDDED PINE OR HEMLOCK BARK MULCH.
8. THE LANDSCAPE CONTRACTOR SHALL RELOCATE ANY PLANT ACCORDING TO THE DIRECTION OF THE LANDSCAPE ARCHITECT.
9. ALL PLANT MATERIALS CALLED FOR AND INSTALLED SHALL MEET OR EXCEED SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" (LATEST EDITION) AS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
10. ALL PLANTING BEDS SHALL BE DEFINED BY A NEAT, SHOVEL-CUT BED LINE. BED LINES SHALL BE TRUE TO FORM AS SHOWN ON THE DRAWINGS, CONSISTING OF SMOOTH CURVES AND SHARP LINES AND CORNERS.
11. IF, BECAUSE OF CULTURE REQUIREMENTS, AVAILABILITY, OR OTHER CIRCUMSTANCES, THE LANDSCAPE CONTRACTOR BELIEVES A PARTICULAR PLANT CALLED FOR IS INAPPROPRIATE, THE LANDSCAPE CONTRACTOR SHALL REPORT THE SITUATION IMMEDIATELY TO THE LANDSCAPE ARCHITECT FOR DECISION.
12. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL RECEIVE 6" LOAM AND SEED.

SITE ABBREVIATIONS

ALT	ALTERNATE	GALV	GALVANIZED	MISC.	MISCELLANEOUS	S	SLOPE
BOC	BOTTOM OF CURB	GC	GENERAL CONTRACTOR	NSD	NEW STORM DRAIN (LINE)	T & B	TOP & BOTTOM
BOW	BOTTOM OF WALL	HC	HANDICAPPED	NSS	NEW SANITARY SEWER (LINE)	TO	TOP OF
CIP	CAST-IN-PLACE	HMA	HOT MIX ASPHALT	NW	NEW WATER (LINE)	TOC	TOP OF CURB
℄	CENTER LINE	HP	HIGH POINT	O.C.	ON CENTER	TOW	TOP OF WALL
CLL	CONTRACT LIMITS LINE	ID	INSIDE DIAMETER	OD	OUTSIDE DIAMETER	TP	TEST PIT
ECB	EXISTING CATCH BASIN	LP	LOW POINT	R	RADIUS	TYP.	TYPICAL
FFE	FINISHED FLOOR ELEVATION	LT	LEFT	RE:	REFER (TO)	UG	UNDERGROUND
GA	GAUGE	MAX.	MAXIMUM	ROW	RIGHT-OF-WAY	W/	WITH
		MIN.	MINIMUM	RT	RIGHT	W/O	WITHOUT

SITE LEGEND

EXISTING		PROPOSED	
BODY OF WATER/STREAM		BOLLARD	
BOLLARD		BORING	
BORING		BRIDGE	
BRIDGE		BUILDING W/ DOOR	
BUILDING W/ DOOR		BUILDING CANOPY	
BUILDING CANOPY		CATCH BASIN	
CATCH BASIN		CHECKDAM - STONE	
CHECKDAM - STONE		COMMUNICATIONS LINE-OH	NTC NTC
COMMUNICATIONS LINE-OH	T T T	COMMUNICATIONS LINE-UG	NUC NUC
COMMUNICATIONS LINE-UG	C C C	CONCRETE PAD	
CONCRETE PAD		CULVERT	
CULVERT		CURB - BITUMINOUS	
CURB - BITUMINOUS		CURB - FLUSH	
CURB - SLOPED GRANITE		CURB - SLOPED GRANITE	
CURB - VERT GRANITE		CURB - VERT GRANITE	
CURB - SLIPFORM		CURB - SLIPFORM	
DETENTION POND		DETENTION POND	
DIRECTION OF FLOW		DIRECTION OF FLOW	
DITCH		DITCH	
DRAIN MANHOLE		DRAIN MANHOLE	
DRIP STRIP		DRIP STRIP	
EASEMENT		EASEMENT	
ELECTRIC MANHOLE		ELECTRIC MANHOLE	
ELECTRIC - OVERHEAD	OHW OHW	ELECTRIC - OVERHEAD	NOHE
ELECTRIC - UNDERGROUND	E E E	ELECTRIC - UNDERGROUND	NUGE
ELEVATION BOT OF CURB	+BOC	ELEVATION BOT OF CURB	+BOC
ELEVATION BOT OF STEP	+BOS	ELEVATION BOT OF STEP	+BOS
ELEVATION TOP OF CURB	+TOC	ELEVATION TOP OF CURB	+TOC
ELEVATION TOP OF STEP	+TOS	ELEVATION TOP OF STEP	+TOS
ELEVATION - SPOT	+100.0	ELEVATION - SPOT	+100.0
FENCE - CHAINLINK	X X X X	EMERGENCY CALL BOX	
FENCE - ORNAMENTAL		EROSION CONTROL MESH	
FIELD INLET		FENCE - CHAINLINK	X X X X
FIRE HYDRANT		FENCE - ORNAMENTAL	
FLAG POLE		FIRE HYDRANT	
FORCE MAIN PIPE	SFM SFM	FLAG POLE	
GAS & FUEL EQUIPMENT	GAS	FORCE MAIN PIPE	NSFM
GAS LINE	G G G	FOUNDATION DRAIN	NFND
GAS VALVE		GAS & FUEL EQUIPMENT	GAS
GENERATOR ON CONC PAD		GAS LINE	NGAS
GRAVEL DRIVE		GAS VALVE	
GUARDRAIL		GENERATOR ON CONC PAD	
HELIPAD		GRAVEL DRIVE	
HIGH POINT ELEVATION	+HP	GUARDRAIL	
IRRIGATION PIPING		HELIPAD	
LANDMARK SIGN		HIGH POINT ELEVATION	+HP
LIGHT - BOLLARD		IRRIGATION PIPING	
LIGHT POLE		LANDMARK SIGN	
LIGHT - SPOT		LIGHT - BOLLARD	
LOW POINT ELEVATION	+LP	LIGHT POLE	
MAJOR CONTOUR	100	LIGHT - SPOT/WALL	
MINOR CONTOUR	100	LIMIT OF WORK	
PARKING AREA-BITUMINOUS		LOW POINT ELEVATION	+LP
PAVEMENT STRIPING		MAJOR CONTOUR	100
PROPERTY LINE		MINOR CONTOUR	102
PROPERTY LINE - ABUTTER		PARKING AREA-BITUMINOUS	
		PAVEMENT STRIPING	
RETAINING WALL		PROPERTY LINE	
RIPRAP		RETAINING WALL	
ROADWAY		RIPRAP	
ROADWAY CENTER LINE		ROADWAY	
SANITARY SEWER PIPE	SS SS	ROADWAY CENTER LINE	
SANITARY SEWER MANHOLE		SANITARY SEWER MANHOLE	
SETBACK		SANITARY SEWER PIPE	NSS NSS
SIGN		SETBACK	
SIGN - TWO-SIDED		SIGN	
SILT FENCE	SF SF	SIGN - TWO-SIDED	
SLOPE NOTATION	S = .01	SILT FENCE	SF SF
SOIL TYPE BOUNDARY		SLOPE NOTATION	S = .01
SPRINKLER		SPRINKLER	
STONE WALL		STONE WALL	
STORM DRAIN PIPE	SD SD	STORM DRAIN PIPE	NSD NSD
TELEPHONE EQUIPMENT	TEL	TELEPHONE EQUIPMENT	TEL
TEST PIT	TP	TEST PIT	
TRAFFIC ARM & SIGNAL		TRAFFIC ARM & SIGNAL	
TRANSFORMER ON CONC	T	TRANSFORMER ON CONC	T
TURF		TURF	
UNDERDRAIN PIPE	UD UD UD UD UD	UNDERDRAIN PIPE	UD UD UD UD UD
UTILITY POLE		UTILITY POLE	
WALKWAY - BITUMINOUS		WALKWAY - BITUMINOUS	
WALKWAY - BRICK/COBBLE		WALKWAY - BRICK/COBBLE	
WALKWAY - CONCRETE		WALKWAY - CONCRETE	
WALL - ORNAMENTAL		WALL - ORNAMENTAL	
WATER GATE VALVE		WATER GATE VALVE	
WATER PIPE (DOMESTIC)	W W W	WATER PIPE (DOMESTIC)	NW NW
WATER PIPE (FIRE)	F	WATER PIPE (FIRE)	NFS NFS
WATER SHUTOFF		WATER SHUTOFF	
WATERSHED BOUNDARY		WELL	W
WETLAND BOUNDARY			

NOTE:
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PORTLAND, MAINE

SITE NOTES & LEGENDS

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
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JOB CAPTAIN:	SDL	C-001	
DRAWN BY:	WSM		
SMRT FILE:	C-001-19206	SHEET No.	

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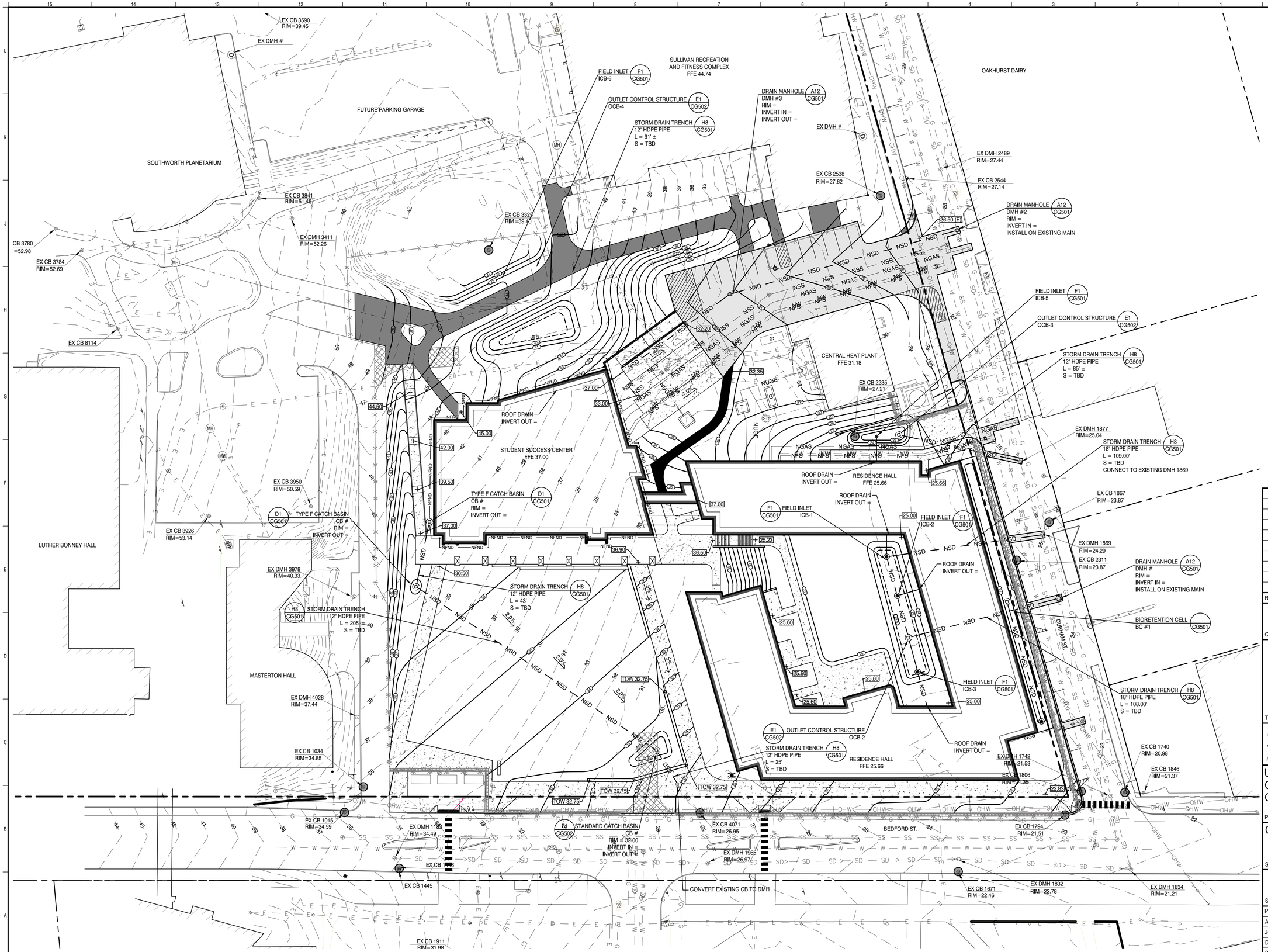

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TRUE NORTH:

STATE OF MAINE
JEFFREY
CETA
No. 6418
LICENSED
PROFESSIONAL ENGINEER

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UNIVERSITY OF SOUTHERN MAINE CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

GRADING & DRAINAGE PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	CG101-19206	SHEET No.	CG101

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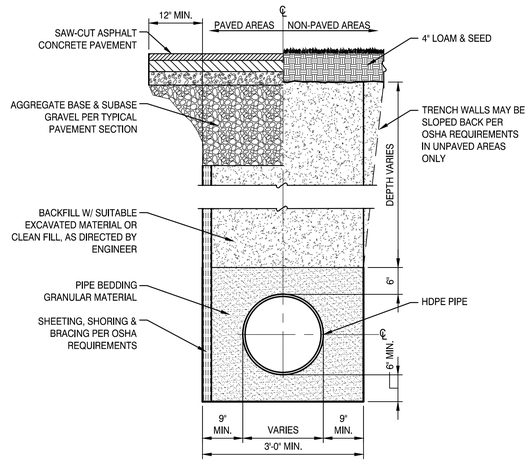
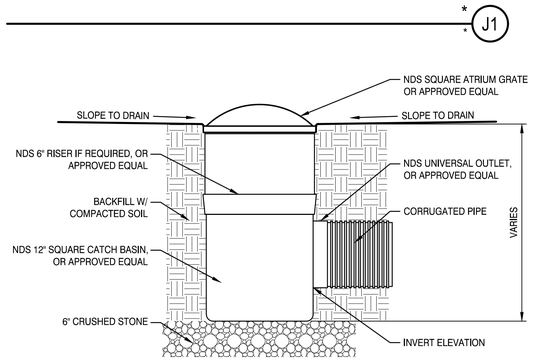
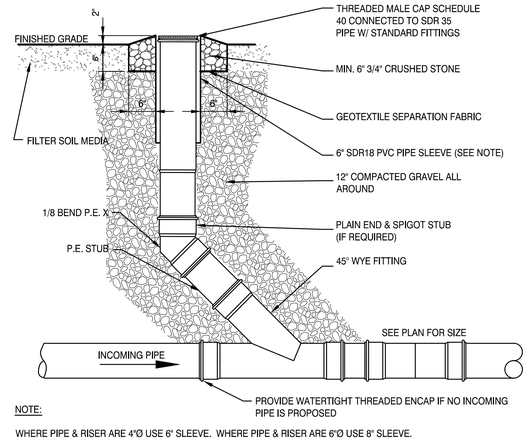
24x36



STORM DRAIN TRENCH H5
NOT TO SCALE

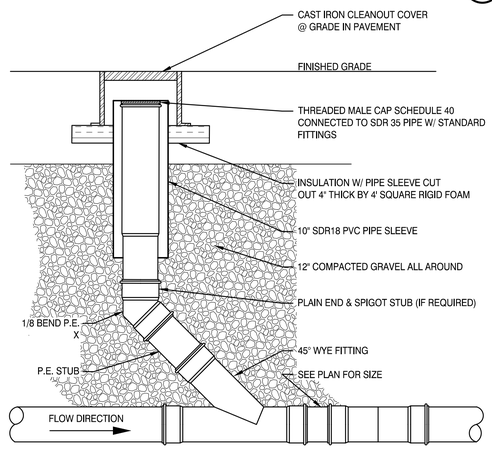


FIELD INLET F1
NOT TO SCALE



NOTE:
WHERE PIPE & RISER ARE 4"Ø USE 6" SLEEVE. WHERE PIPE & RISER ARE 6"Ø USE 8" SLEEVE.

CLEANOUT - VEGETATED AREAS E8
*

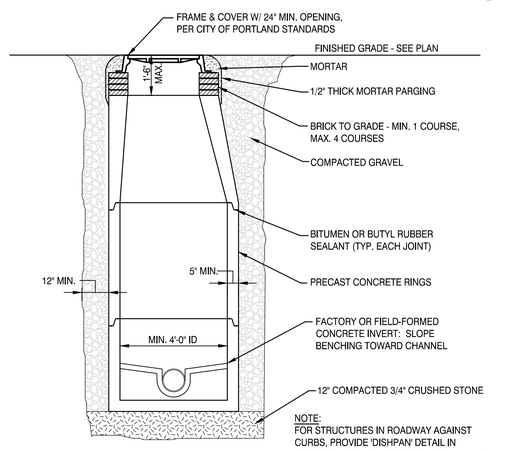


CLEANOUT - PAVED AREAS E5
NOT TO SCALE

NOTES:
1. STANDARD GRATES SHALL BE NEENAH R-3210-L OR APPROVED EQUAL.
2. DITCH GRATES SHALL BE NEENAH R-4342 OR APPROVED EQUAL.
3. BEEHIVE GRATES SHALL BE NEENAH R-4353 OR APPROVED EQUAL.

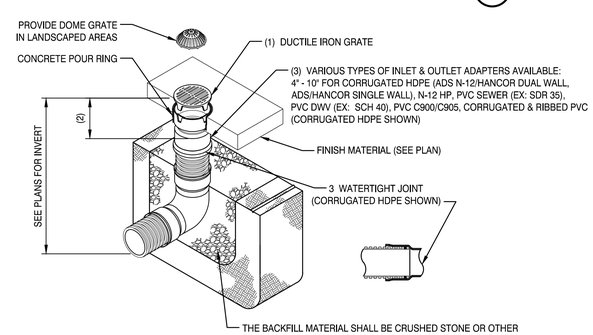
TYPE F CATCH BASIN D1
1/2" = 1'-0"

UNDERDRAIN D12
1 1/2" = 1'-0"



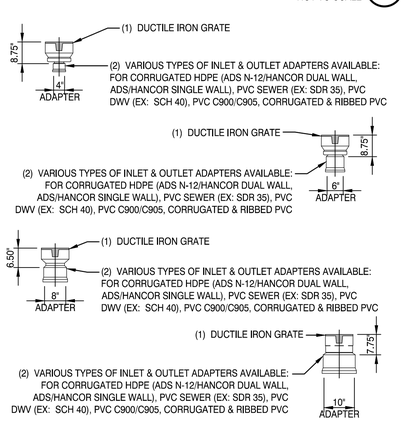
NOTE:
FOR STRUCTURES IN ROADWAY AGAINST CURBS, PROVIDE 'DISHPAN' DETAIL IN ACCORDANCE WITH CITY TECHNICAL MANUAL

DRAIN MANHOLE A12
NOT TO SCALE



NOTES:
1. GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FOR COMPLETE DESIGN DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL) & PVC SEWER.

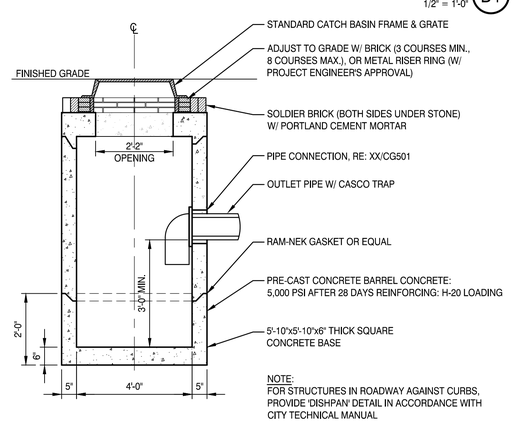
GRATE OPTIONS	LOAD RATING	PART #
PEDESTRIAN/STANDARD	LIGHT DUTY	1099CGS
SOLID COVER	LIGHT DUTY	1099CGC
BRONZE	N/A	1099CGB
DOME	N/A	1099CGD



NOTES:
1. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC.
2. DIMENSIONS ARE FOR REFERENCE ONLY, ACTUAL DIMENSIONS MAY VARY.

DESIGN DETAILS

IN-LINE DRAIN A5
NOT TO SCALE



NOTE:
FOR STRUCTURES IN ROADWAY AGAINST CURBS, PROVIDE 'DISHPAN' DETAIL IN ACCORDANCE WITH CITY TECHNICAL MANUAL

STANDARD CATCH BASIN A1
1/2" = 1'-0"

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20
CURRENT ISSUE STATUS:

STATE OF MAINE JEFFREY J. CETO No. 6418 LICENSED PROFESSIONAL ENGINEER

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PORTLAND, MAINE

GRADING & DRAINAGE DETAILS

SHEET TITLE:

0 1/2" 1" 2" 3"
SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	CG501-19206	SHEET No.	CG501

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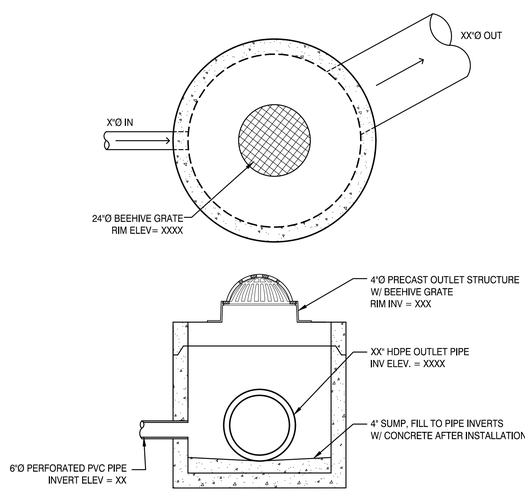
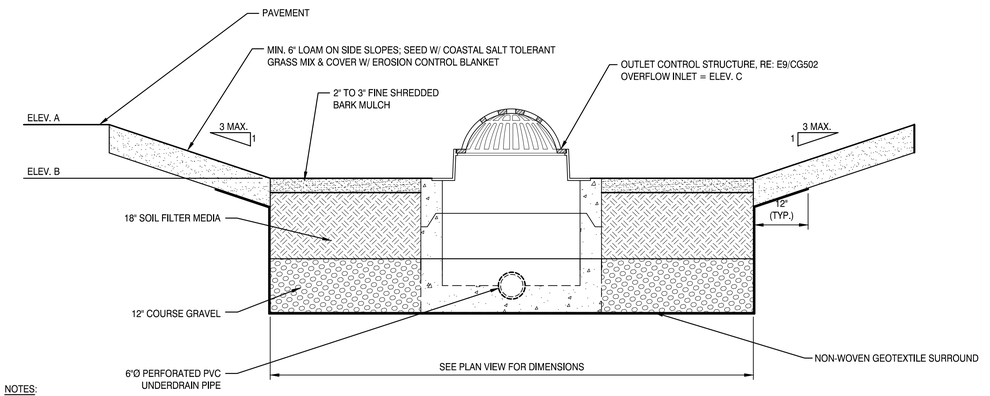


OUTLET CONTROL STRUCTURE E9



BIORETENTION CELL A1

NOTES:

1. SEED FOR SLOPES SHALL BE COASTAL SALT TOLERANT GRASS MIX BY NEW ENGLAND WETLAND PLANTS, INC. OR APPROVED EQUAL. SEE LANDSCAPE PLANS FOR OTHER PLANTINGS.
2. EROSION BLANKET SHALL BE A DOUBLE NET STRAW/COCONUT BIODEGRADABLE BLANKET (NORTH AMERICAN GREEN SC150BN OR APPROVED EQUAL).
3. SOIL FILTER MEDIA SHALL CONSIST OF A SILTY SAND COMBINED WITH 20% TO 25% (BY VOLUME) OF A MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH. RESULTING MIXTURE SHALL HAVE A FINES CONTENT OF AT LEAST 8% WITH A CLAY CONTENT OF LESS THAN 2%.
4. INSTALLATION OF BIORETENTION AREAS SHALL NOT COMMENCE UNTIL ALL DISTURBED AREAS UPSTREAM OF THE SITES HAVE BEEN PERMANENTLY STABILIZED.

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20
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PORTLAND, MAINE

GRADING & DRAINAGE DETAILS

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	CG502-19206	SHEET No.	CG502

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SULLIVAN RECREATION AND FITNESS COMPLEX
FFE 44.74

OAKHURST DAIRY

FUTURE PARKING GARAGE

SOUTHWORTH PLANETARIUM

SECONDARY CONSTRUCTION GATE

CONSTRUCTION FENCE (TYP.) (LIMIT OF WORK)

STABILIZED CONSTRUCTION ENTRANCE A1 CE501

STUDENT SUCCESS CENTER
FFE 37.00

CENTRAL HEAT PLANT
FFE 31.18

RESIDENCE HALL
FFE 25.66

CONSTRUCTION FENCE (TYP.) (LIMIT OF WORK)

SILT FENCE / HAYBALE BARRIER (TYP.) A9 CE501

LUTHER BONNEY HALL

MASTERTON HALL

STABILIZED CONSTRUCTION ENTRANCE A1 CE501

RESIDENCE HALL
FFE 25.66

SILT SACK (TYP.) C5 CE501

PRIMARY CONSTRUCTION GATE

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH

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STATE OF MAINE
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PORTLAND, MAINE

EROSION & SEDIMENT CONTROL PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
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EROSION & SEDIMENTATION CONTROL NOTES:

TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES INCLUDE THE USE OF STABILIZED CONSTRUCTION ENTRANCE, SILTATION FENCE, EROSION CONTROL MIX BERM, STONE CHECK DAMS, HAY BALE BARRIERS, CATCH BASIN INLET BARRIERS, CATCH BASIN SEDIMENT COLLECTION BAGS, EROSION CONTROL BLANKET, AND TEMPORARY SEEDING AND MULCHING AS REQUIRED. PERMANENT DEVICES INCLUDE THE USE OF RIP RAP AT EXPOSED STORM DRAIN AND CULVERT INLETS AND OUTLETS, RIP RAPPED SLOPES, AND PERMANENT VEGETATION.

GENERAL

A. IT IS ANTICIPATED THAT CONSTRUCTION MAY BEGIN AS SOON AS POSSIBLE FOLLOWING RECEIPT OF NECESSARY PERMITS.

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES PUBLISHED BY THE THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, (2016, OR AS CURRENTLY REVISED), OR U.S ENVIRONMENTAL PROTECTION AGENCY PUBLICATION 832/R-92-005 (SEPTEMBER, 1992, OR AS CURRENTLY REVISED) STORM WATER MANAGEMENT FOR CONSTRUCTION, CHAPTER 3, WHICHEVER IS MORE STRINGENT.

2. ANY ADDITIONAL EROSION AND SEDIMENTATION CONTROL DEEMED NECESSARY BY THE OWNER'S REPRESENTATIVE, DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) PERSONNEL AND/OR MUNICIPAL OFFICIALS SHALL BE INSTALLED BY THE CONTRACTOR.

3. THE CONTRACTOR IS RESPONSIBLE FOR ALL FINES RESULTING FROM EROSION OR SEDIMENTATION FROM THE SITE TO SURROUNDING PROPERTIES, WATER BODIES, OR WETLANDS AS A RESULT OF THIS PROJECT.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR/ REPLACEMENT/ MAINTENANCE OF ALL EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE ABOVE PERSONNEL. DESCRIPTIONS OF ACCEPTABLE PERMANENT STABILIZATION FOR VARIOUS COVER TYPES FOLLOWS:

A. FOR SEEDED AREAS, PERMANENT STABILIZATION MEANS A 90% COVER OF THE DISTURBED AREA WITH MATURE, HEALTHY PLANTS WITH NO EVIDENCE OF WASHING OR RILLING OF THE TOPSOIL.

B. FOR SODDED AREAS, PERMANENT STABILIZATION MEANS THE COMPLETE BINDING OF THE SOD ROOTS INTO THE UNDERLYING SOIL WITH NO SLUMPING OF THE SOD OR DIE-OFF.

C. FOR MULCHED AREAS, PERMANENT MULCHING MEANS TOTAL COVERAGE OF THE EXPOSED AREA WITH AN APPROVED MULCH MATERIAL. EROSION CONTROL MIX MAY BE USED AS MULCH FOR PERMANENT STABILIZATION ACCORDING TO THE APPROVED APPLICATION RATES AND LIMITATIONS.

D. FOR AREAS STABILIZED WITH RIP RAP, PERMANENT STABILIZATION MEANS THAT SLOPES STABILIZED WITH RIP RAP HAVE AN APPROPRIATE BACKING OF A WELL-GRADED GRAVEL OR APPROVED GEOTEXTILE TO PREVENT SOIL MOVEMENT FROM BEHIND THE RIP RAP. STONE MUST BE SIZED APPROPRIATELY.

E. PAVED AREAS: FOR PAVED AREAS, PERMANENT STABILIZATION MEANS THE PLACEMENT OF THE COMPACTED GRAVEL SUBBASE IS COMPLETED.

F. FOR OPEN CHANNELS, PERMANENT STABILIZATION MEANS THE CHANNEL IS STABILIZED WITH MATURE VEGETATION AT LEAST THREE INCHES IN HEIGHT, WITH WELL-GRADED RIP RAP, OR WITH ANOTHER NON-EROSIVE LINING CAPABLE OF WITHSTANDING THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHOUT RELIANCE ON CHECK DAMS TO SLOW FLOW. THERE MUST BE NO EVIDENCE OF SLUMPING OF THE LINING, UNDERCUTTING OF THE BANKS, OR DOWN CUTTING OF THE CHANNEL.

B. EROSION AND SEDIMENTATION CONTROL MEASURES

1. PRIOR TO THE BEGINNING OF CONSTRUCTION, THE STABILIZED CONSTRUCTION ENTRANCE AND TEMPORARY SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. IT IS THE INTENT THAT SILT FENCE OR EROSION CONTROL MIX BERM BE INSTALLED DOWN GRADIENT OF ALL DISTURBED AREAS OF THE SITE. SILT FENCE SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS WILL BE MADE IMMEDIATELY. SEDIMENT DEPOSITS SHALL BE PERIODICALLY REMOVED FROM THE UPSTREAM SIDE OF THE SILT BARRIERS. THIS SEDIMENT WILL BE SPREAD AND STABILIZED IN AREAS OF THE SITE NOT SUBJECT TO EROSION. SILT FENCE OR EROSION CONTROL MIX BERM SHALL BE REPLACED AS NECESSARY TO PROVIDE PROPER FILTERING ACTION. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, THEY WILL BE REPLACED WITH A TEMPORARY CRUSHED STONE CHECK DAM.

2. ALL CATCH BASINS, NEW OR EXISTING, THAT MAY RECEIVE RUNOFF FROM DISTURBED AREAS MUST BE PROTECTED DURING CONSTRUCTION.

3. REMOVAL OF SOD, TREES, BUSHES AND OTHER VEGETATION AND SOIL DISTURBANCE WILL BE KEPT TO A MINIMUM WHILE ALLOWING PROPER SITE DEVELOPMENT.

4. GRUBBINGS AND ANY UNUSABLE TOPSOIL SHALL BE STRIPPED AND REMOVED FROM THE PROJECT SITE AND DISPOSED OF IN AN APPROVED MANNER.

5. ANY SUITABLE TOPSOIL WILL BE STRIPPED AND STOCKPILED FOR REUSE IN FINAL GRADING. TOPSOIL WILL BE STOCKPILED IN A MANNER SUCH THAT NATURAL DRAINAGE IS NOT OBSTRUCTED AND NO OFF-SITE SEDIMENT DAMAGE WILL RESULT. SEDIMENT BARRIERS SHALL BE INSTALLED DOWN-GRADIENT OF ALL SOIL STOCKPILES AND STORMWATER SHALL BE PREVENTED FROM RUNNING ONTO ALL STOCKPILES. IF A STOCKPILE IS NECESSARY, THE SIDE SLOPES OF THE TOPSOIL STOCKPILE WILL NOT EXCEED 2:1. TOPSOIL STOCKPILES WILL BE TEMPORARILY SEEDED WITH AROOSTOOK RYE, ANNUAL OR PERENNIAL RYE GRASS WITHIN 7 DAYS OF FORMATION, OR TEMPORARILY MULCHED IF SEEDING CANNOT BE DONE WITHIN THE RECOMMENDED SEEDING DATES.

6. TEMPORARY DIVERSION BERMS AND DRAINAGE SWALES SHALL BE CONSTRUCTED AS NECESSARY.

7. TEMPORARY STABILIZATION SHALL BE CONDUCTED WITHIN 7 DAYS OF INITIAL DISTURBANCE OF SOILS, PRIOR TO ANY RAIN EVENT, AND PRIOR TO ANY WORK SHUT DOWN LASTING MORE THAN ONE DAY. TEMPORARY STABILIZATION INCLUDES SEED, MULCH, OR OTHER NON-ERODABLE COVER.

8. TEMPORARY SEEDING SPECIFICATIONS: WHERE SEEDBED HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME, AND SEED. APPLY LIMESTONE AT A RATE OF 3 TONS PER ACRE (138 LB. PER 1,000 SQUARE FEET) AND 10-10-10 (N-P2O5-K2O) FERTILIZER AT A RATE OF 600 LBS PER ACRE (13.8 LB. PER 1,000 SQUARE FEET). UNIFORMLY APPLY SEED AT THE RECOMMENDED SEEDING RATES AND DATES, APPLY HAY OR STRAW MULCH AT A RATE OF 2 TONS PER ACRES, AND ANCHOR AS NECESSARY.

RECOMMENDED TEMPORARY SEEDING DATES AND APPLICATION RATES ARE AS FOLLOWS:

AROOSTOOK RYE:
RECOMMENDED SEEDING DATES: 8/15 -10/1
APPLICATION RATE: 112 LBS/ACRE

ANNUAL RYE GRASS:
RECOMMENDED SEEDING DATES: 4/1 - 7/1
APPLICATION RATE: 40 LBS/ACRE

PERENNIAL RYE GRASS:
RECOMMENDED SEEDING DATES: 8/15 - 9/15
APPLICATION RATE: 40 LBS/ACRE

9. PERMANENT SEEDING SPECIFICATION. IF A LANDSCAPE PLAN HAS BEEN PREPARED FOR THE PROJECT, SOIL PREPARATION AND SEED SPECIFICATIONS OF THAT PLAN SHALL SUPERSEDE THESE GENERAL PERMANENT SEEDING REQUIREMENTS. IT IS RECOMMENDED THAT PERMANENT SEEDING BE COMPLETED BETWEEN APRIL 1 AND JUNE 15 OF EACH YEAR. LATE SEASON SEEDING MAY BE DONE BETWEEN AUGUST 15 AND SEPTEMBER 15. AREAS NOT SEEDED OR WHICH DO NOT OBTAIN A SATISFACTORY GROWTH BY OCTOBER 1 SHALL BE SEEDED WITH AROOSTOOK RYE MULCHED AT RATES PREVIOUSLY SPECIFIED. SEE WINTER CONDITIONS NOTES FOR SEEDING STABILIZATION AFTER NOVEMBER 1.

A. APPLY TOPSOIL TO A MINIMUM DEPTH OF 4 INCHES. MIX TOPSOIL WITH THE SUBSOIL TO A MINIMUM DEPTH OF 6 INCHES.

B. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TESTS. IN LIEU OF SOIL TESTS, APPLY GROUND LIMESTONE AT A RATE OF 3 TONS PER ACRE (138 LB. PER 1,000 SQUARE FEET) AND GRANULAR, COMMERCIAL-GRADE, 10-10-10 (N-P2O5-K2O) FERTILIZER AT A RATE OF 800 LBS PER ACRE (18.4 LBS PER 1,000 SQUARE FEET).

C. UNIFORMLY APPLY SEED MIXTURE AT THE RECOMMENDED SEEDING RATES AND DATES, APPLY HAY OR STRAW MULCH AT A RATE OF 2 TONS PER ACRES, AND ANCHOR AS NECESSARY.

D. THE SEED MIXTURE FOR LAWN AND FILTRATION BASIN AREAS SHALL CONSIST OF SEEDS PROPORTIONED BY WEIGHT AS FOLLOWS:

30% CREEPING RED FESCUE
50% KENTUCKY BLUEGRASS
20% ITALIAN/PERENNIAL RYE GRASS

NOTE: SEED MIXTURE SHALL CONSIST OF AT LEAST TWO VARIETIES OF EACH TYPE OF GRASS. WHEN USED IN A FILTER BASIN, STORMWATER SHALL NOT BE DIRECTED TO THE BASIN UNTIL THE GRASS IS ESTABLISHED.

10. MULCH ALL AREAS SEEDED SO THAT SOIL IS NOT VISIBLE THROUGH THE MULCH REGARDLESS OF THE APPLICATION RATE.

11. DITCH LININGS, STONE CHECK DAMS, AND RIP RAP INLET AND OUTLET PROTECTION SHALL BE INSTALLED WITHIN 48 HOURS OF COMPLETING THE GRADING OF THAT SECTION OF DITCH OR INSTALLATION OF CULVERT.

12. RIP RAP REQUIRED AT CULVERTS AND STORM DRAIN INLETS AND OUTLETS SHALL CONSIST OF FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE.

13. EROSION CONTROL BLANKET SHALL BE INSTALLED ON ALL PERMANENT SLOPES STEEPER THAN 15%, IN THE BASE OF DITCHES NOT OTHERWISE PROTECTED, AND ANY DISTURBED AREAS WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE (E.G. WETLANDS AND WATER BODIES). EROSION CONTROL BLANKET SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

14. TEMPORARY CONTROL MEASURES, SUCH AS SILT FENCE, SHALL BE REMOVED WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED.

15. TEMPORARY EROSION CONTROL MIX BERM SHALL BE REMOVED BY SPREADING MATERIAL IN AREAS OF THE SITE NOT SUBJECT TO EROSION.

C. WINTER CONDITIONS

1. "WINTER CONSTRUCTION" IS CONSTRUCTION ACTIVITY PERFORMED DURING THE PERIOD FROM NOVEMBER 1ST THROUGH APRIL 15TH. IF AREAS WITHIN THE CONSTRUCTION ACTIVITY ARE NOT STABILIZED WITH TEMPORARY OR PERMANENT MEASURES OUTLINED ABOVE BY NOVEMBER 15TH, THEN THE SITE MUST BE PROTECTED WITH ADDITIONAL STABILIZATION MEASURES THAT ARE SPECIFIC TO WINTER CONDITIONS. NO MORE THAN ONE ACRE OF THE SITE MAY BE WITHOUT STABILIZATION AT ONE TIME.

2. SILT FENCE: IN LIEU OF PROVIDING THE 4" X 4" TRENCH, FOR FROZEN GROUND, STONY SOIL, THE PRESENCE OF LARGE ROOTS, OR OTHER PROHIBITIVE CONDITIONS, THE BOTTOM 8" TO 12" OF THE FABRIC MAY BE LAID ON EXISTING GRADE AND BACK FILLED WITH STONE ANCHORING MATERIAL, AS SHOWN ON THE DRAWINGS.

3. AREAS WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS.

4. HAY MULCH SHALL BE APPLIED AT TWICE THE STANDARD TEMPORARY STABILIZATION RATE. AT THE END OF EACH CONSTRUCTION DAY, AREAS THAT HAVE BEEN BROUGHT TO FINAL GRADE MUST BE STABILIZED. MULCH MAY NOT BE SPREAD ON TOP OF SNOW.

5. AFTER NOVEMBER 1ST OR THE FIRST KILLING FROST FOR THE REGION AND BEFORE SNOW FALL, ALL EXPOSED AND DISTURBED AREAS NOT TO UNDERGO FURTHER DISTURBANCE ARE TO HAVE DORMANT SEEDING. THE DORMANT SEEDING METHOD: PREPARE THE SEEDBED, LIME AND FERTILIZE, APPLY THE SELECTED PERMANENT SEED MIXTURE AT DOUBLE THE REGULAR SEEDING RATE, AND MULCH AND ANCHOR. DORMANT SEEDINGS NEED TO BE ANCHORED EXTREMELY WELL ON SLOPES, DITCH BASES AND AREAS OF CONCENTRATED FLOWS. DORMANT SEEDING REQUIRES INSPECTION AND RESEEDING AS NEEDED IN THE SPRING. ALL AREAS WHERE COVER IS INADEQUATE MUST BE IMMEDIATELY RESEEDED AND MULCHED AS SOON AS POSSIBLE.

6. ALL VEGETATED DITCH LINES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1ST, OR WILL BE WORKED DURING THE WINTER CONSTRUCTION PERIOD, MUST BE STABILIZED WITH AN APPROPRIATE STONE LINING BACKED BY AN APPROPRIATE GRAVEL BED OR GEOTEXTILE UNLESS SPECIFICALLY RELEASED FROM THIS STANDARD BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

7. MULCH NETTING MUST BE USED TO ANCHOR MULCH ON ALL SLOPES GREATER THAN 8% UNLESS EROSION CONTROL BLANKETS OR EROSION CONTROL MIX IS BEING USED ON THESE SLOPES.

D. HOUSEKEEPING

1. SPILL PREVENTION. CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM CONSTRUCTION AND WASTE MATERIALS STORED ON-SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORM WATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.

2. GROUNDWATER PROTECTION. DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS, ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.

3. FUGITIVE SEDIMENT AND DUST. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL.

4. DEBRIS AND OTHER MATERIAL. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORM WATER, MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

5. COMPLY WITH THE REQUIREMENTS OF SECTION 01570, CONSTRUCTION WASTE MANAGEMENT, FOR REMOVAL AND DISPOSAL OF CONSTRUCTION DEBRIS AND WASTE.

6. TRENCH OR FOUNDATION DE-WATERING. THE COLLECTED WATER REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED AREAS THAT ARE SPECIFICALLY DESIGNATED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFER DAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE.

7. STREET SWEEPING.

8. PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. AUTHORIZED NON-STORMWATER DISCHARGES ARE:

A. DISCHARGES FROM FIRE-FIGHTING ACTIVITY,
B. FIRE HYDRANT FLUSHINGS,
C. DUST CONTROL RUNOFF,
D. ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVLOVE DETERGENTS,
E. PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURED, UNLESS ALL SPILLED MATERIAL HAS BEEN REMOVED) IF DETERGENTS ARE NOT USED,
F. UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE,
G. UNCONTAMINATED GROUNDWATER OR SPRING WATER,
H. FOUNDATION OF FOOTING DRAIN WATER WHERE FLOWS ARE NOT CONTAMINATED,
I. UNCONTAMINATED EXCAVATION DEWATERING,
J. POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS,
K. LANDSCAPE IRRIGATION.

9. NO DISCHARGE FROM THE FOLLOWING IS ALLOWED. UNAUTHORIZED NON-STORMWATER DISCHARGES ARE:

A. WASTEWATER FROM WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS, OR OTHER CONSTRUCTION MATERIALS,
B. FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE,
C. SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING,
D. TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

E. INSPECTION AND MAINTENANCE

1. INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION AND STORM WATER CONTROL MEASURES, AREAS USED FOR STORAGE THAT ARE EXPOSED TO PRECIPITATION, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE AT LEAST ONCE A WEEK AS WELL AS BEFORE AND WITHIN 24 HOURS AFTER A STORM EVENT (RAINFALL), AND PRIOR TO COMPLETION OF PERMANENT STABILIZATION. A PERSON WITH KNOWLEDGE OF EROSION AND STORM WATER CONTROLS, INCLUDING THE STANDARDS IN ALL DEP AND MUNICIPAL COMPANION DOCUMENTS, MUST CONDUCT THE INSPECTION. THIS PERSON MUST BE IDENTIFIED IN THE INSPECTION LOG. IF BEST MANAGEMENT PRACTICES (BMPS) NEED TO BE MODIFIED OF IF ADDITIONAL BMPS ARE NECESSARY, IMPLEMENTATION MUST BE COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS ARE PERMANENTLY STABILIZED.

2. AN INSPECTION AND MAINTENANCE LOG MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME AND QUALIFICATIONS OF THE PERSON PERFORMING THE INSPECTION, DATE, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. MAJOR OBSERVATIONS MUST INCLUDE: BMPS THAT NEED TO BE MAINTAINED, LOCATION(S) OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, AND LOCATION(S) WHERE ADDITIONAL BMPS ARE NEEDED THAT DID NOT EXIST AT THE TIME OF THE INSPECTION. FOLLOW-UP TO CORRECT DEFICIENCIES OR ENHANCE CONTROLS MUST ALSO BE INDICATED IN THE LOG AND DATED, INCLUDING WHAT ACTION WAS TAKEN AND WHEN.

3. INSPECTIONS DURING CONSTRUCTION SHOULD BE PERFORMED AT LEAST ONCE PER WEEK AND AFTER EVERY RAINFALL EVENT.

F. CONSTRUCTION SCHEDULE & SEQUENCE

1. INSTALL TEMPORARY EROSION CONTROL MEASURES IN THE VICINITY OF THE CONSTRUCTION AREA, INCLUDING A STABILIZED CONSTRUCTION ENTRANCE AT LOCATIONS DEEMED NECESSARY BY THE OWNER'S REPRESENTATIVE, SEDIMENT BARRIERS, AND SILT FENCE. NOTE: TEMPORARY EROSION CONTROL MEASURES FOR WINTER CONDITIONS SHALL BE IMPLEMENTED.

2. GRUB THE SITE, STOCKPILE REUSABLE MATERIAL, AND DISPOSE OF UNUSABLE AND/OR SURPLUS MATERIAL. INSTALL UNDERGROUND UTILITIES AND BUILD DRIVE AND PARKING TO GRADE.

3. EXCAVATE FOUNDATIONS.

4. CONSTRUCT BUILDING.

5. CONSTRUCT OTHER SITE IMPROVEMENTS, INCLUDING PAVEMENT.

6. PLACE LOAM, SEED, AND MULCH.

7. FOLLOWING PERMANENT STABILIZATION OF THE SITE, REMOVE TEMPORARY EROSION CONTROL MEASURES.

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20
CURRENT ISSUE STATUS:

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PORTLAND, MAINE

EROSION & SEDIMENT
CONTROL NOTES

SHEET TITLE:

SCALE: 0 1/2" 1" 2" 3"

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL	CE001	
DRAWN BY:	WSM		
SMRT FILE:	CE001-19206	SHEET No.	

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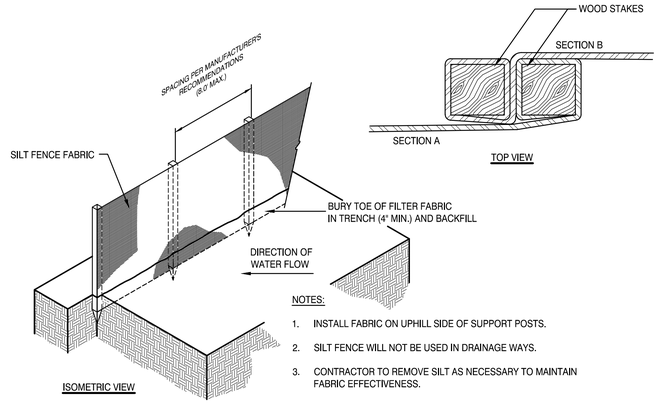
24x36

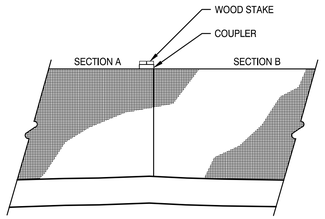


ISOMETRIC VIEW

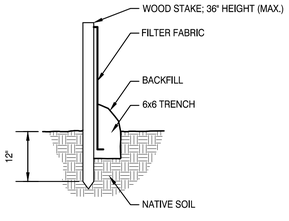
TOP VIEW

NOTES:

1. INSTALL FABRIC ON UPHILL SIDE OF SUPPORT POSTS.
2. SILT FENCE WILL NOT BE USED IN DRAINAGE WAYS.
3. CONTRACTOR TO REMOVE SILT AS NECESSARY TO MAINTAIN FABRIC EFFECTIVENESS.



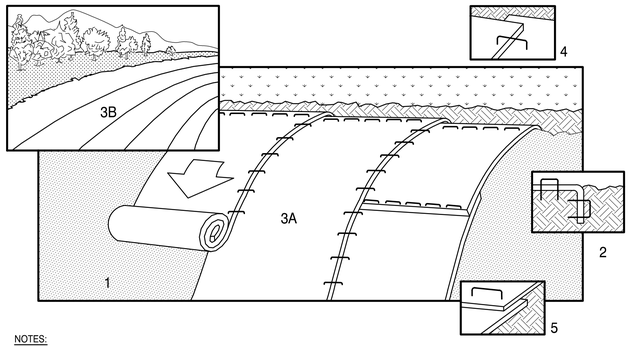
JOINING SECTIONS



TOE-IN METHOD

SILT FENCE F10

NOT TO SCALE

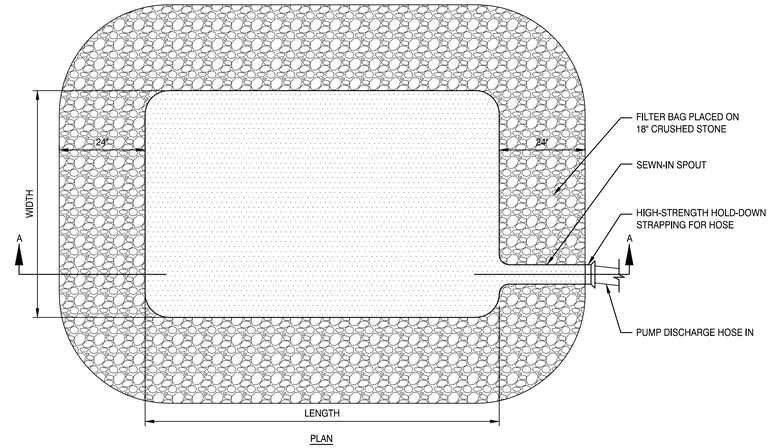


NOTES:

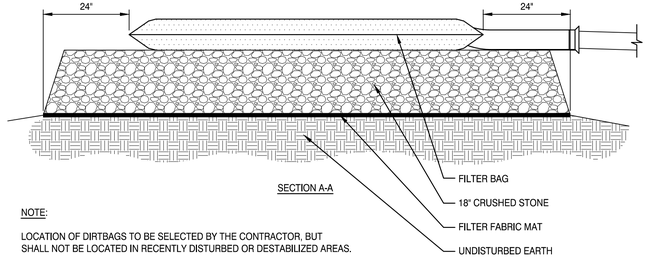
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP. REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
6. EROSION CONTROL BLANKET FOR USE ON SLOPES SHALL BE A BIODEGRADABLE DOUBLE NET WOVEN BLANKET WITH JUTE NETTING AND COCONUT FIBRE MATRIX SPECIFICALLY MANUFACTURED FOR THE PURPOSE (NORTH AMERICAN GREEN) BIO-NET S150BN OR APPROVED EQUAL.
7. ONCE PERMANENT STABILIZATION IS ACHIEVED, REMOVE ANY NON-BIODEGRADABLE MESH, IF USED.

EROSION CONTROL BLANKET F5

NOT TO SCALE



PLAN



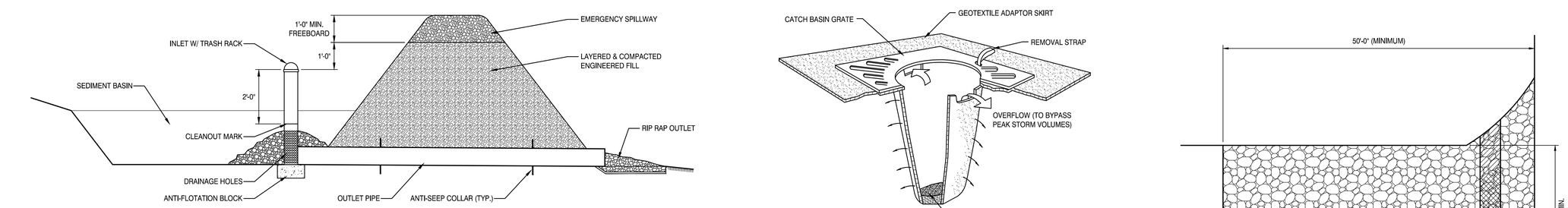
SECTION A-A

NOTE:

LOCATION OF DIRTBAGS TO BE SELECTED BY THE CONTRACTOR, BUT SHALL NOT BE LOCATED IN RECENTLY DISTURBED OR DESTABILIZED AREAS.

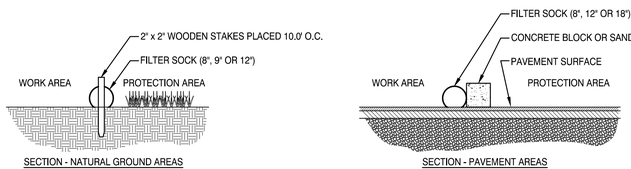
DIRT BAG F1

NOT TO SCALE



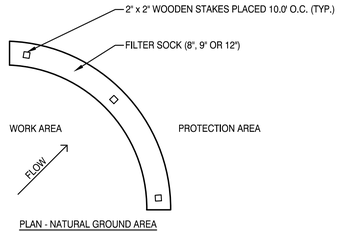
TEMPORARY SEDIMENT BASIN D9

NOT TO SCALE

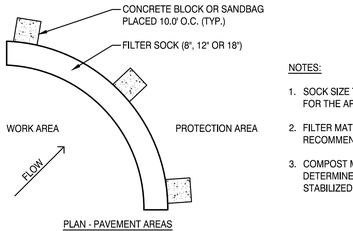


SECTION - NATURAL GROUND AREAS

SECTION - PAVEMENT AREAS



PLAN - NATURAL GROUND AREA



PLAN - PAVEMENT AREAS

NOTES:

1. SOCK SIZE TO BE PER MANUFACTURER'S RECOMMENDATION FOR THE APPLICATION.
2. FILTER MATERIAL TO BE PER MANUFACTURER'S RECOMMENDATION FOR THE APPLICATION.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER AFTER SITE IS PERMANENTLY STABILIZED.

FILTER SOCK A9

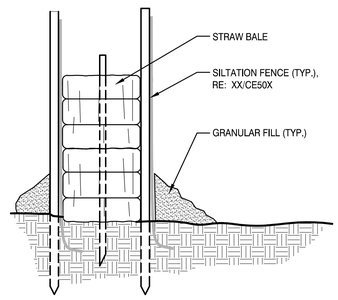
NOT TO SCALE

NOTES:

1. CATCH BASIN PROTECTION TO BE "SILTSACK" (BY ACF ENVIRONMENTAL) OR "STREAM GUARD" (BY FOSS ENVIRONMENTAL SERVICES).
2. INSERT TO BE EMPTIED IN AN APPROVED MANNER WHEN IT IS 1/2 FULL OF SEDIMENT.
3. INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN AS REQUIRED.

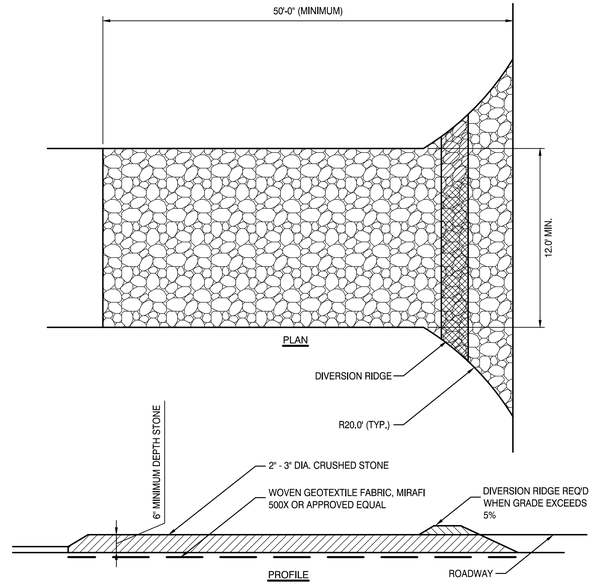
SILT SACK C5

NOT TO SCALE



SILT FENCE / HAYBALE BARRIER A5

NOT TO SCALE



PLAN

PROFILE

NOTES:

1. THE PURPOSE IS TO REMOVE MUD FROM TIRES OF CONSTRUCTION VEHICLES.
2. WHEN STONE BECOMES CLOGGED AND INEFFECTIVE, TOPDRESS WITH 3" OF NEW STONE OR REPLACE ENTIRE PAD.
3. IF TIRE WASHING IS REQUIRED, WASH WATER SHALL DRAIN INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. REMOVE ENTIRE SYSTEM AT COMPLETION OF THE PROJECT, AND RESTORE TO ORIGINAL CONDITION.

STABILIZED CONSTRUCTION ENTRANCE A1

NOT TO SCALE

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

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CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

EROSION & SEDIMENT CONTROL DETAILS

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	CE501-19206	SHEET No.	CE501

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SULLIVAN RECREATION AND FITNESS COMPLEX
FFE 44.74

OAKHURST DAIRY

FUTURE PARKING GARAGE

SOUTHWORTH PLANETARIUM

2 TON 15' OC

2 TON 15' OC

STANDARD EVERGREEN PLANTING (TYP.) H1 LP501

H5 LP501 DRIP STRIP @ BLDG. FACE WHERE NOT PAVED (TYP.)

CENTRAL HEAT PLANT
FFE 31.18

1 TC AS SHOWN

5 AG 15' OC

5 TON 25' OC

2 TON 15' OC

STUDENT SUCCESS CENTER
FFE 37.00

62 DP 2' OC

43 CA 2' OC

42 ES 2' OC

15 JH 3' OC

1 ZS AS SHOWN

RESIDENCE HALL
FFE 25.66

20 NE 2' OC

24 CA 2' OC

30 ES 2' OC

48 CA 2' OC

3 AF 30' OC

33 NE 2' OC

16 CA 2' OC

22 AU 3' OC

53 DP 2' OC

LUTHER BONNEY HALL

MASTERTON HALL

QUAD (LAWN)

LAWN

19 AK 3' OC

5 AF 30' OC

40 AK 3' OC

63 JH 3' OC

109 AK 3' OC

62 AK 3' OC

68 AK 3' OC

87 NE 2' OC

46 RL 3' OC

4 ZS 30' OC

151 HD 2' OC

45 CP 2' OC

3 OC AS SHOWN

B1 LP501 STANDARD SHRUB PLANTING (TYP.)

A1 LP501 STANDARD PERENNIAL PLANTING (TYP.)

RESIDENCE HALL
FFE 25.66

DRIP STRIP @ BLDG. FACE WHERE NOT PAVED (TYP.) H5 LP501

3 MA 50' OC

STANDARD TREE PLANTING (TYP.) E1 LP501

9 MA AS SHOWN

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
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REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH

TRUE NORTH:

LICENSED LANDSCAPE ARCHITECT
MARK G. JOHNSON
NO. 1857
STATE OF MAINE
3-6-2020

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CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PLANTING & LANDSCAPING PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	MGJ		
JOB CAPTAIN:	SDL		LP101
DRAWN BY:	WSM		
SMRT FILE:	LP101-19206	SHEET No.	

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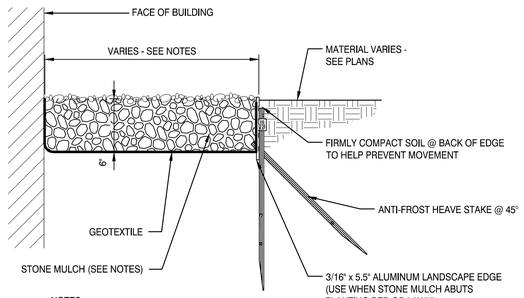
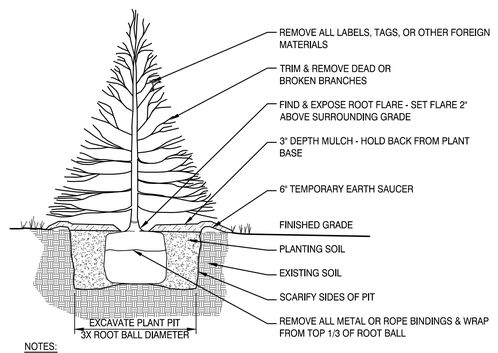


NOTES:

1. STONE MULCH TO BE ROUNDED RIVERSTONE, 3" INCHES DIA. MAX., WASHED AND FREE OF FOREIGN OR ORGANIC MATERIALS.
2. STANDARD MAINTENANCE STRIP TO BE 12" WIDE.
3. STANDARD DRIP STRIP TO BE WIDTH OF BUILDING EAVE PLUS 12" UNLESS SHOWN OTHERWISE.
4. EDGE TO BE BY SURE-LOC ALUMINUM EDGING CORP, OR APPROVED EQUAL .
   - MILL FINISH
   - 12" STAKES
   - ANTI-FROST HEAVE STAKE POCKETS @ 8' O.C.

DRIP STRIP H5

NOT TO SCALE

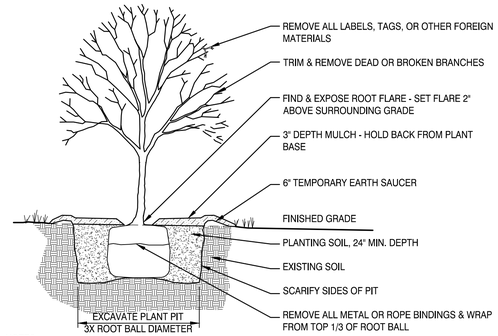


NOTES:

1. TREE TO BE SET PLUMB.
2. SECURE TREE AS MAY BE REQUIRED ACCORDING TO TREE SIZE, LOCATION, & WIND/WEATHER CONDITIONS.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

STANDARD EVERGREEN PLANTING H1

NOT TO SCALE

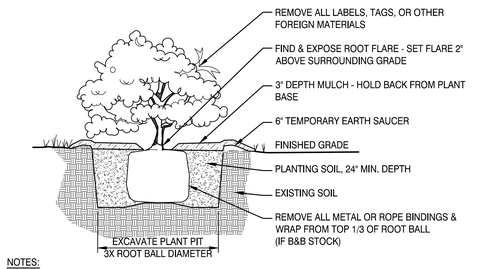


NOTES:

1. TREE TO BE SET PLUMB.
2. SECURE TREE AS MAY BE REQUIRED ACCORDING TO TREE SIZE, LOCATION, & WIND/WEATHER CONDITIONS.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

STANDARD DECIDUOUS TREE PLANTING E1

NOT TO SCALE

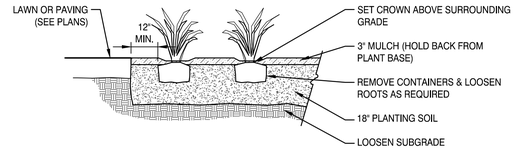


NOTES:

1. SHRUB TO BE SET PLUMB.

STANDARD SHRUB PLANTING B1

NOT TO SCALE



STANDARD PERENNIAL PLANTING A1

NOT TO SCALE

MARK	SCIENTIFIC NAME / COMMON NAME	SIZE CAL	SIZE HT	ROOT	REMARKS
TREES					
AG	Amelanchier x grandiflora 'Autumn Brilliance' / Autumn Brilliance Serviceberry	1 1/2"	6'-8'	B & B	Clump form, 3-stem minimum
AF	Acer x freemani 'Armstrong' / Armstrong Red Maple	2"	12'-14'	B & B	Full, matched specimens
MA	Malus 'Adirondack' / Adirondack Crabapple	1 1/2"	6'-8'	B & B	Full, matched specimens
TC	Tilia cordata 'Greenspire' / Littleleaf Linden	2"	12'-14'	B & B	Full, matched specimens
ZS	Zelkova serrata 'Musashino' / Musashino Zelkova	2"	12'-14'	B & B	Full, matched specimens
SHRUBS					
AU	Arctostaphylos uva-ursi / Bearberry	#2	18"	Cont.	
AK	Azalea 'Karen' / Evergreen Azalea	#2	18"	Cont.	
JH	Juniperus horzontalis 'Bar Harbor' Bar Harbor Juniper	#2	6"	Cont.	
RL	Rhododendron laetivirens 'Wilson' / Wilson Rhododendron	#2	18"	Cont.	
SP	Stewartia pseudocamellia / Japanese Stewartia	#7	5'-6'	Cont.	Full, matched specimens
TON	Thuja occidentalis 'Nigra' / Dark American Arborvitae	#5	5'-6'	Cont.	
PERENNIALS					
CA	Calamagrostis x accutifolia 'Karl Foerster' / Feather Reed Grass	#1	-	Cont.	
CP	Carex pennsylvanica / Sedge	#1	-	Cont.	
DP	Dennstaedtia punctiloba / Hayscented Fern	#1	-	Cont.	
ES	Echinacea Sombrero Lemon Yellow / Coneflower	#1	-	Cont.	
HD	Hosta 'Dream Weaver' / Hosta	#1	-	Cont.	
NE	Nepeta 'Early Bird' / Catmint	#1	-	Cont.	
OC	Osmunda cinnamomea / Cinnamon Fern	#1	-	Cont.	

PLANT SCHEDULE A5

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

LICENSED LANDSCAPE ARCHITECT
MARK G. JOHNSON
NO. 1857
STATE OF MAINE
3-6-2020

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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PLANTING & LANDSCAPING DETAILS & SCHEDULE

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	MGJ		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	LP501-19206	SHEET No.	LP501

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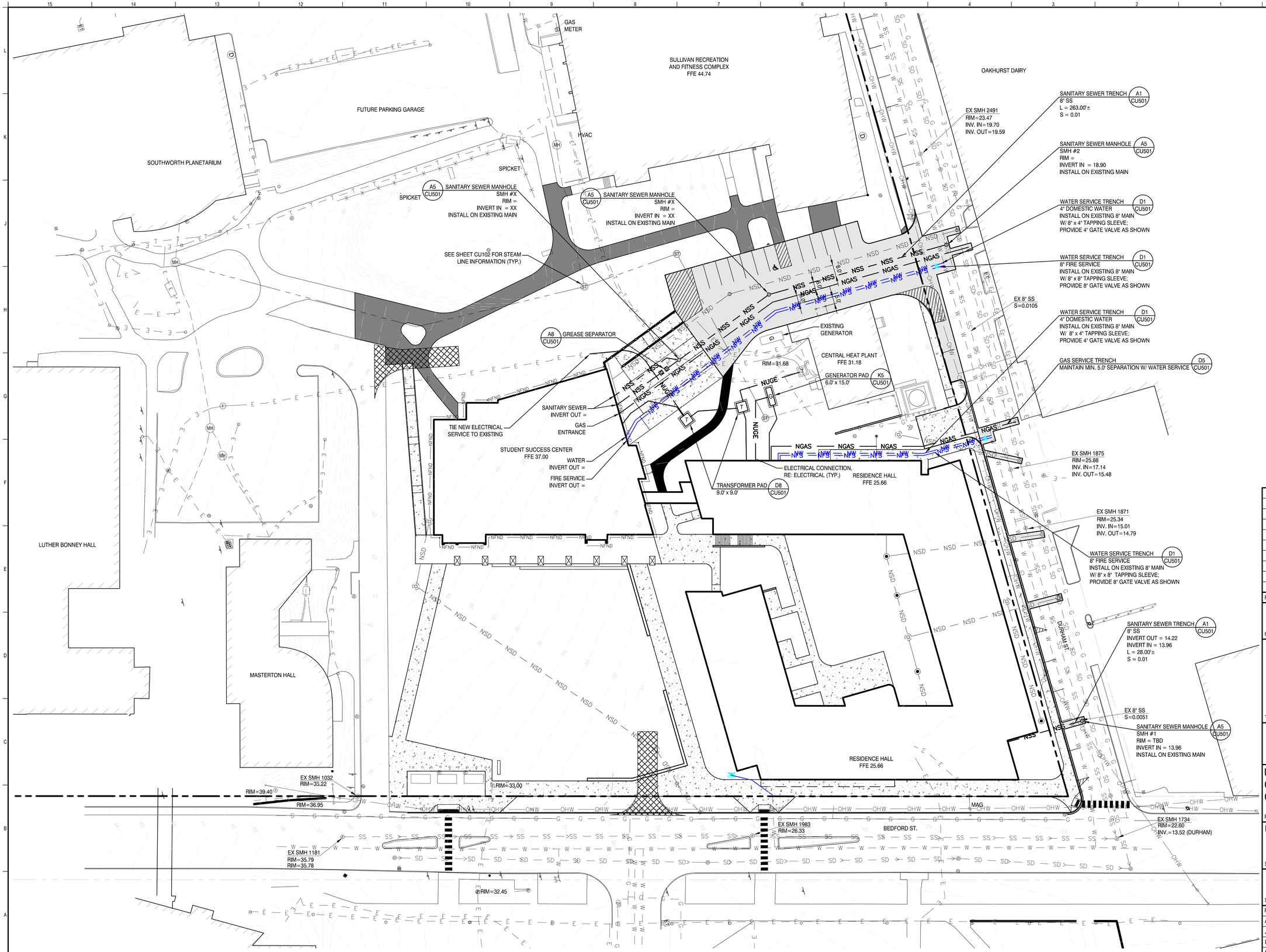

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH:

JEFFREY T. JACKSON No. 8418 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

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UNIVERSITY OF SOUTHERN MAINE CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

UTILITY PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		
DRAWN BY:	WSM		
SMRT FILE:	CU101-19206	SHEET No.	CU101

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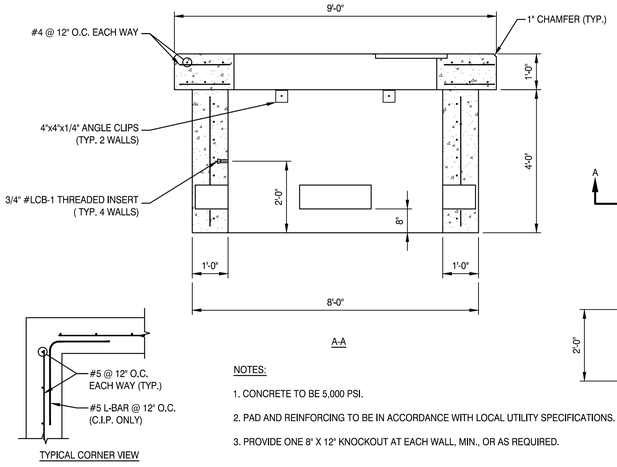
24x36

STEAM TRENCH G12



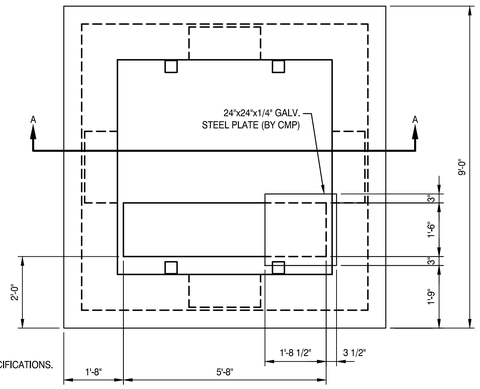
NOTES:

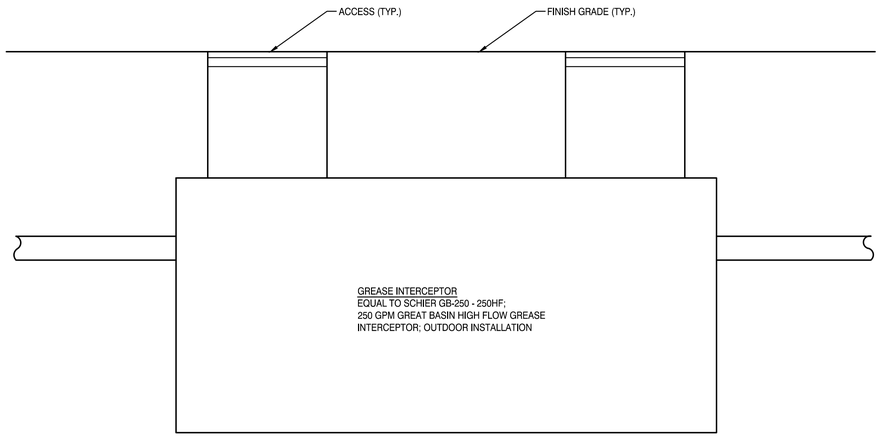
1. CONCRETE TO BE 5,000 PSI.
2. PAD AND REINFORCING TO BE IN ACCORDANCE WITH LOCAL UTILITY SPECIFICATIONS.
3. PROVIDE ONE 8" X 12" KNOCKOUT AT EACH WALL, MIN., OR AS REQUIRED.

TRANSFORMER PAD D8

NOT TO SCALE

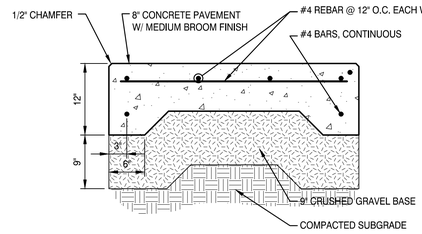
STEAM STRUCTURE G8





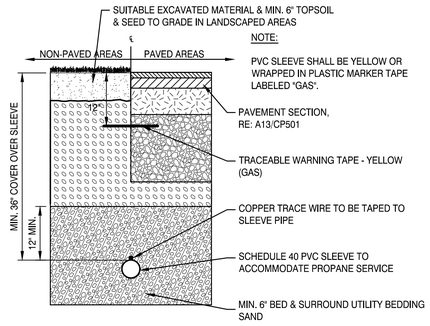
GREASE INTERCEPTOR A8

1/2" = 1'-0"



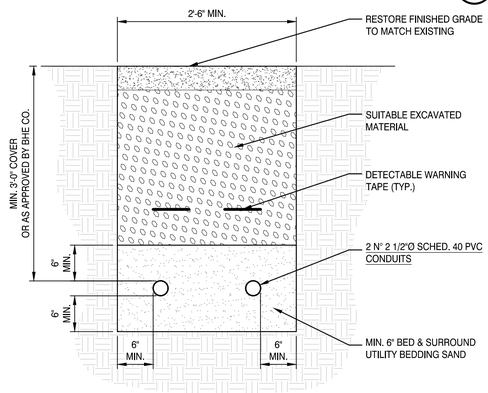
GENERATOR PAD K5

NOT TO SCALE



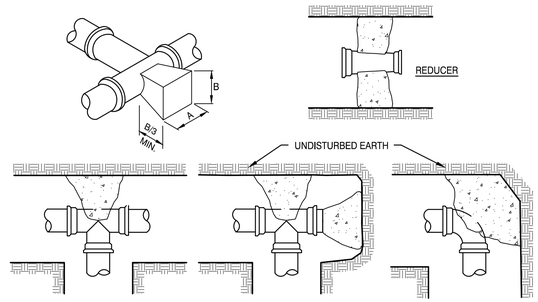
GAS SERVICE TRENCH D5

NOT TO SCALE



PRIMARY ELECTRIC TRENCH D5

NOT TO SCALE



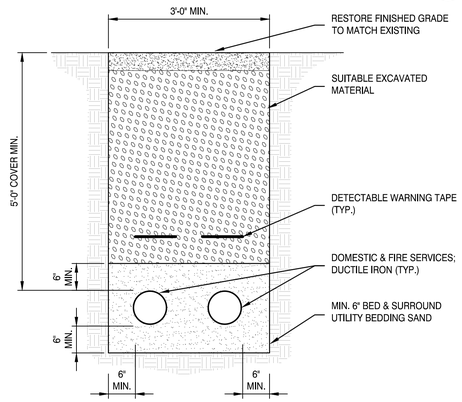
FITTING SIZES	TEES & PLUGS		90° BEND		45° BEND & WYE		REDUCER, 11 1/4° & 22 1/2° BENDS	
	A	B	A	B	A	B	A	B
4"	1'-7"	1'-2"	1'-9"	1'-5"	1'-8"	0'-10"	1'-7"	0'-6"
6"	2'-0"	1'-11"	2'-5"	2'-2"	1'-10"	1'-7"	1'-9"	0'-10"
8"	2'-8"	2'-6"	3'-2"	3'-0"	2'-5"	2'-1"	1'-9"	1'-6"
10"	3'-4"	3'-3"	4'-0"	3'-10"	3'-0"	2'-9"	2'-2"	1'-11"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"	2'-7"	2'-3"
14"	5'-5"	3'-10"	6'-6"	4'-11"	4'-9"	3'-5"	3'-5"	2'-5"

NOTES:

1. DIMENSIONS ARE BASED ON 150 PSI WATER PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.
2. WRAP ALL FITTINGS WITH POLYETHYLENE.
3. GRIP-RING PIPE RESTRAINERS TO BE USED IN CONJUNCTION WITH THRUST BLOCKS.

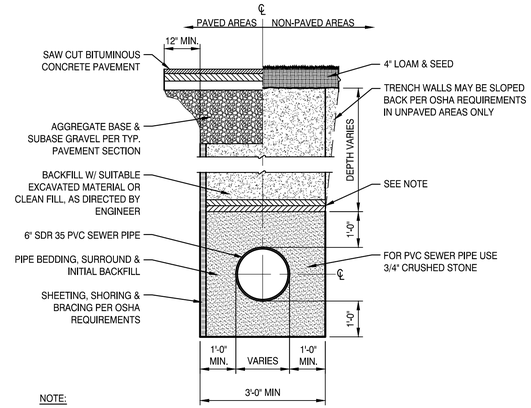
THRUST BLOCKS G1

NOT TO SCALE



WATER SERVICE TRENCH D1

3/4" = 1'-0"

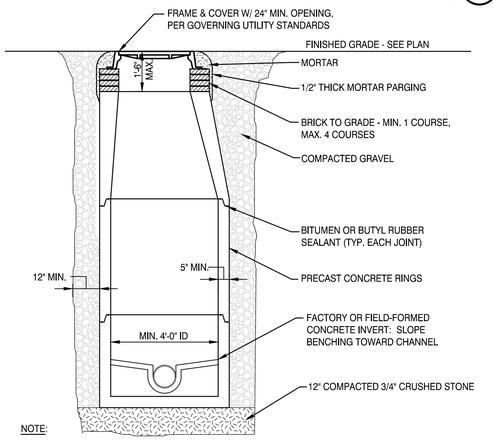


NOTE:

INSULATE GRAVITY SEWER WHERE COVER IS LESS THAN FOUR FEET. USE 2" THICK RIGID STYROFOAM INSULATION FOR FULL WIDTH OF TRENCH.

SANITARY SEWER TRENCH A1

NOT TO SCALE



NOTE:

PROVIDE DROP PIPE FOR ALL INVERT DIFFERENTIALS GREATER THAN TWO (2) FEET.

SANITARY SEWER MANHOLE A5

NOT TO SCALE

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1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

STATE OF MAINE
JEFFREY
CETO
No. 6418
LICENSED
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CENTER & RESIDENCE HALL

PORTLAND, MAINE

UTILITY DETAILS

SHEET TITLE:

0 1/2" 1" 2" 3"

SCALE:

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL	CU501	
DRAWN BY:	WSM		
SMRT FILE:	CU501-19206	SHEET No.	

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SULLIVAN RECREATION AND FITNESS COMPLEX
FFE 44.74

OAKHURST DAIRY

FUTURE PARKING GARAGE

SOUTHWORTH PLANETARIUM

EXISTING STEAM MANHOLE HP3

EXISTING STEAM LINE ST #6

STEAM MANHOLE PR HP 20 CU501

STEAM TRENCH ST #2 CU501

STEAM MANHOLE PR HP 30 CU501

STEAM TRENCH ST #3 CU501

EXISTING STEAM MANHOLE HP5

STEAM TRENCH ST #4 CU501

EXISTING STEAM LINE ST #7

CENTRAL HEAT PLANT
FFE 31.18

DURHAM ST.

EXISTING STEAM MANHOLE HP4

STUDENT SUCCESS CENTER
FFE 37.00

RESIDENCE HALL
FFE 25.66

EXISTING STEAM LINE ST #1

STEAM MANHOLE PR HP 10 CU501

LUTHER BONNEY HALL

MASTERTON HALL

RESIDENCE HALL
FFE 25.66

BEDFORD ST.

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH:

JEFFREY T. ACETO
No. 6418
STATE OF MAINE
LICENSED PROFESSIONAL ENGINEER

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UNIVERSITY OF SOUTHERN MAINE CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

STEAM LINE PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		CU102
DRAWN BY:	WSM		
SMRT FILE:	CU102-19206	SHEET No.	

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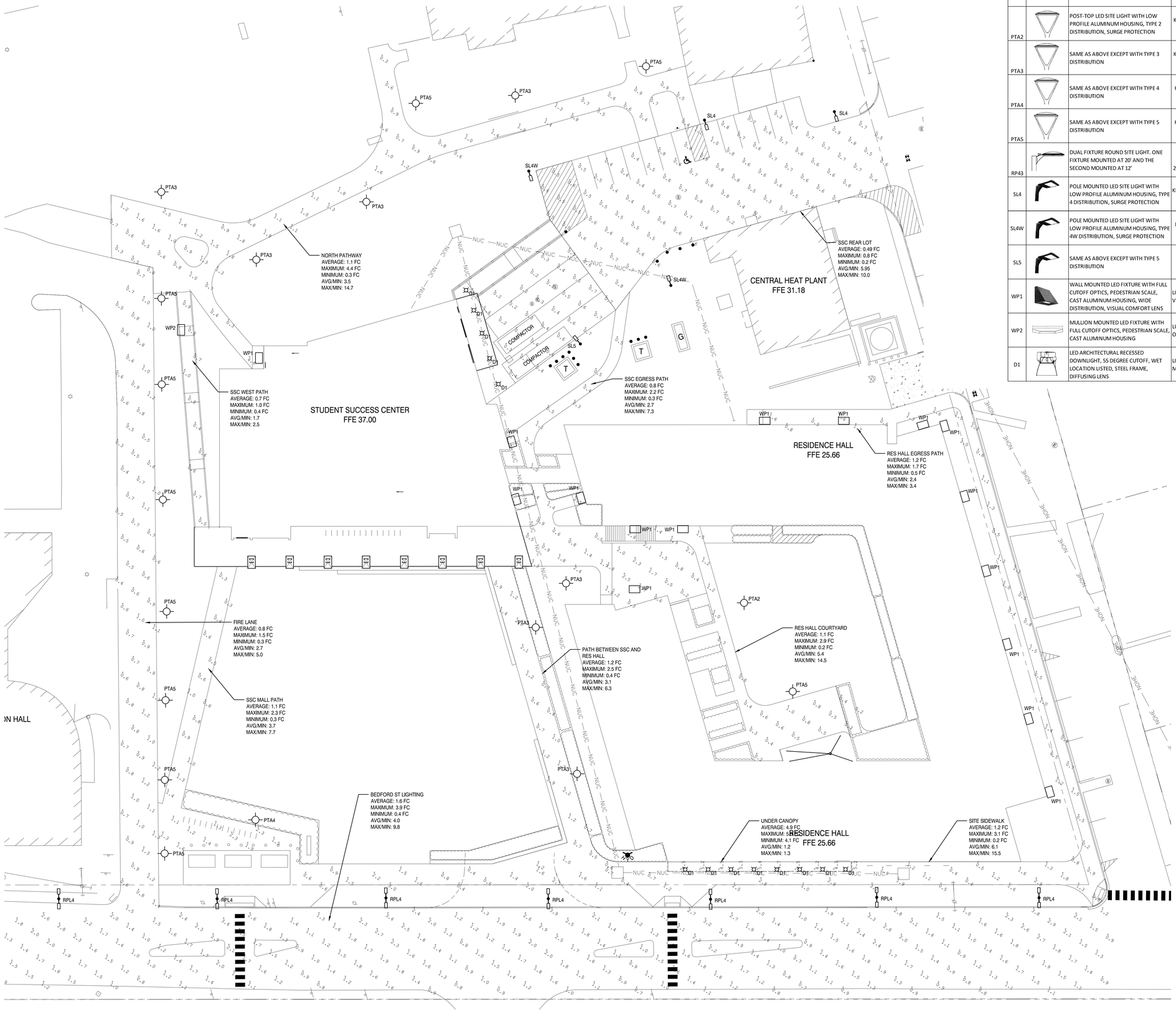
13. CONSTRUCTION MANAGEMENT PLAN

A Construction Management Plan has been prepared by PC Construction for the proposed development. The Contractor will be required to provide adequate safety fencing and signage directing pedestrians safely around the construction area. The Construction Management Plan is attached to this Section for your reference.

13.1 Attachments

- Construction Management Plan prepared by PC Construction (Uploaded to the Construction Management Plan folder on Eplan)



SITE & LANDSCAPE LIGHTING SCHEDULE

LABEL	IMAGE	DESCRIPTION	MANUFACTURER & MODEL NUMBER	QUANTITY	BUG RATING	FULL CUTOFF?	WATTAGE	OUTPUT	CONTROL METHOD	MOUNTING
PTA2		POST-TOP LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 2 DISTRIBUTION, SURGE PROTECTION	KIM LIGHTING UR20-24L-25-3K7-2-PT-UNV-BLT-SF	1	B1-U0-G1	YES	25 W	3,000 LUMENS	TIME CLOCK	12' TALL ROUND 4" OD ALUMINUM POLE
PTA3		SAME AS ABOVE EXCEPT WITH TYPE 3 DISTRIBUTION	KIM LIGHTING UR20-24L-25-3K7-3-PT-UNV-BLT-SF	7	B1-U0-G1	YES	25 W	3,000 LUMENS	TIME CLOCK	ROUND 12' X 4" ALUMINUM POLE
PTA4		SAME AS ABOVE EXCEPT WITH TYPE 4 DISTRIBUTION	KIM LIGHTING UR20-24L-25-3K7-4W-PT-UNV-BLT-SF	1	B1-U0-G2	YES	25 W	3,000 LUMENS	TIME CLOCK	ROUND 12' X 4" ALUMINUM POLE
PTA5		SAME AS ABOVE EXCEPT WITH TYPE 5 DISTRIBUTION	KIM LIGHTING UR20-24L-25-3K7-5W-PT-UNV-BLT-WSP-40F-1-SF	10	B2-U0-G1	YES	25 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE
RP43		DUAL FIXTURE ROUND SITE LIGHT. ONE FIXTURE MOUNTED AT 20' AND THE SECOND MOUNTED AT 12'	KIM LIGHTING 12': UR20-24L-25-3K7-3-UNV-BLT-SF 20': UR20-56L-75-3K7-4W-UNV-BLT-SF	7	B2-U0-G1 B1-U0-G2	YES	100 W		TIME CLOCK & MOTION SENSOR	ROUND 12' X 4" ALUMINUM POLE
SL4		POLE MOUNTED LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 4 DISTRIBUTION, SURGE PROTECTION	KIM LIGHTING ALT1-28L-20-3K7-4-UNV-A34-BLT-NXSP30F-SF	2	B1-U0-G1	YES	20 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE
SL4W		POLE MOUNTED LED SITE LIGHT WITH LOW PROFILE ALUMINUM HOUSING, TYPE 4W DISTRIBUTION, SURGE PROTECTION	KIM LIGHTING ALT1-28L-20-3K7-4W-UNV-A34-BLT-NXSP30F-SF	2	B1-U0-G1	YES	20 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE
SL5		SAME AS ABOVE EXCEPT WITH TYPE 5 DISTRIBUTION	KIM LIGHTING ALT1-28L-20-3K7-5R-UNV-A34-BLT-NXSP30F-SF	1	B2-U0-G2	YES	20 W	3,000 LUMENS	TIME CLOCK & MOTION SENSOR	ROUND 20' X 4" ALUMINUM POLE
WP1		WALL MOUNTED LED FIXTURE WITH FULL CUTOFF OPTICS, PEDESTRIAN SCALE, CAST ALUMINUM HOUSING, WIDE DISTRIBUTION, VISUAL COMFORT LENS	LITHONIA WDGE2-LED-P1-30K-80CRI-VW-MVOLT-PIRH-DBLBXD	15	B0-U0-G0	YES	10 W	1,200 LUMENS	TIME CLOCK & MOTION SENSOR	SURFACE, 12' AFG
WP2		MULLION MOUNTED LED FIXTURE WITH FULL CUTOFF OPTICS, PEDESTRIAN SCALE, CAST ALUMINUM HOUSING	LUMINAIRE LED BLD 36-15W 3000K BLK OCC	1	B0-U0-G0	YES	15 W	1,500 LUMENS	TIME CLOCK & MOTION SENSOR	SURFACE, 8' AFG
D1		LED ARCHITECTURAL RECESSED DOWNLIGHT, 55 DEGREE CUTOFF, WET LOCATION LISTED, STEEL FRAME, DIFFUSING LENS	LITHONIA LDN4-30-05-L04AR-LSS-MVOLT-EZ1	13	NA	YES	6 W	500 LUMENS	TIME CLOCK	RECESSED

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH:

WILLIAM R. HOUGHTON No. 7560 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE
7/24/20

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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PHOTOMETRIC PLAN

SHEET TITLE:

0 10' 20' 40' 80'
SCALE: 1" = 20'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	WRH		
JOB CAPTAIN:	SDL		
DRAWN BY:	RBB		
SMRT FILE:	ES103-19206	SHEET No.	ES103

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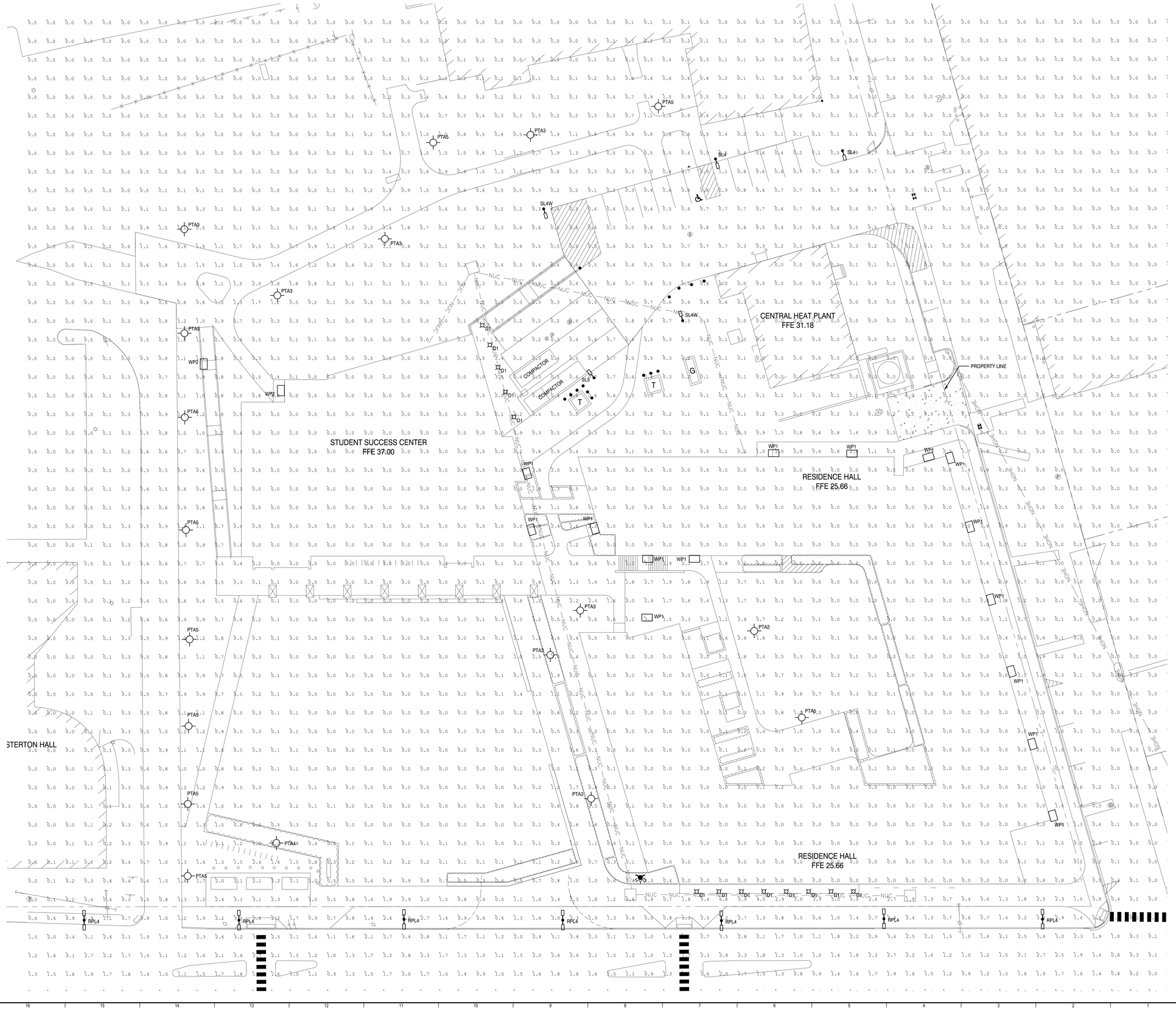

REV	DESCRIPTION	DATE
1	REISSUED FOR PERMITTING	7-24-20
0	ISSUED FOR SD AND PERMITTING	3-6-20

REISSUED FOR PERMITTING
7-24-20

CURRENT ISSUE STATUS:

TRUE NORTH

TRUE NORTH:

STATE OF MAINE
WILLIAM R. BRAGG
No. 7680
LICENSED
PROFESSIONAL ENGINEER
7/24/20

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UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

PHOTOMETRIC PLAN

SHEET TITLE:

0 10' 20' 40' 80'

SCALE: 1" = 20'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	WRH		
JOB CAPTAIN:	SDL		
DRAWN BY:	RBB		
SMRT FILE:	ES104-19206	SHEET No.	ES104

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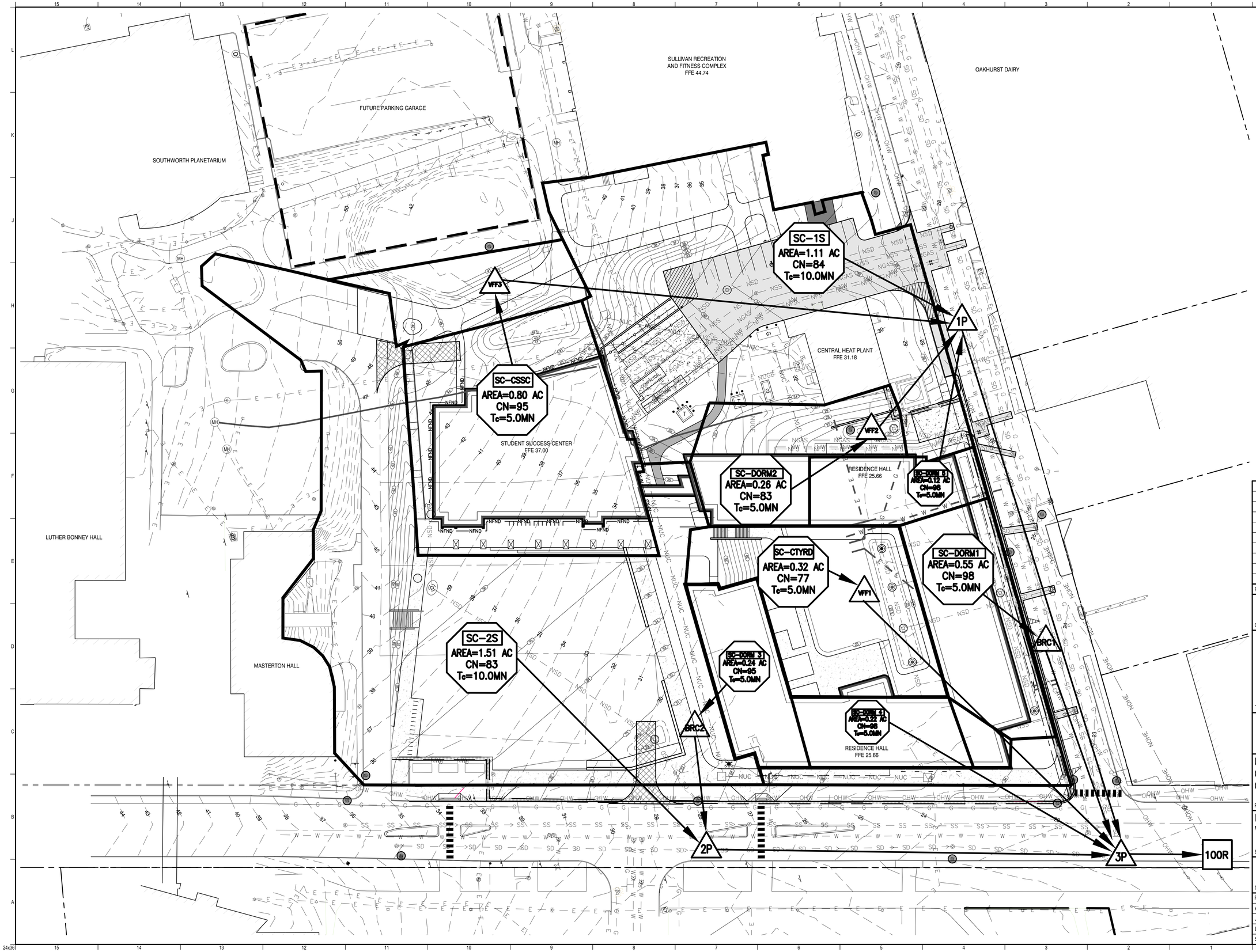

REV	DESCRIPTION	DATE

REISSUED FOR PERMITTING
7-24-20

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CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL

PORTLAND, MAINE

POST-DEVELOPMENT WATERSHED PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		C-121
DRAWN BY:	WSM		
SMRT FILE:	C-121-19206	SHEET No.	

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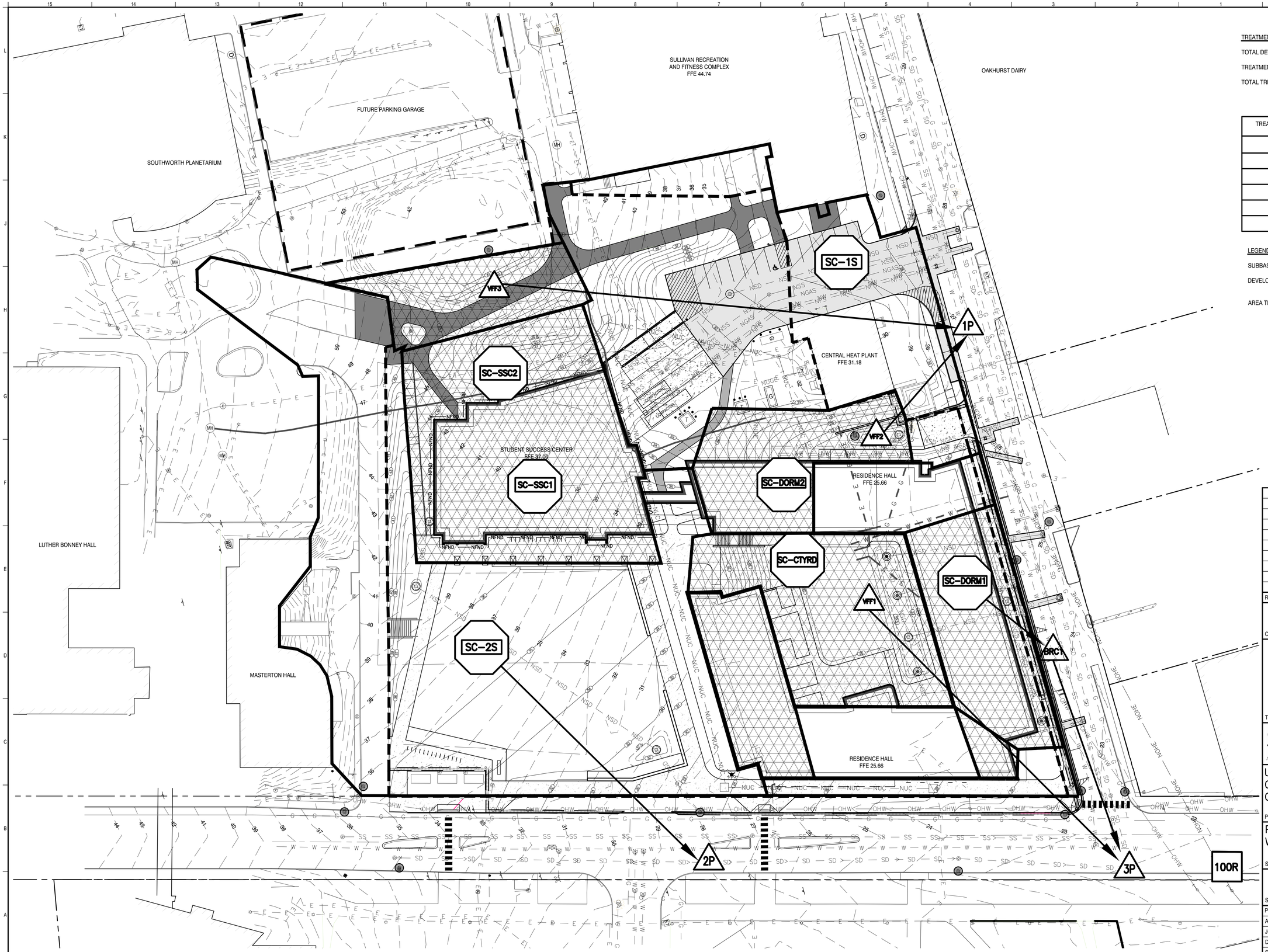

TREATMENT SUMMARY:

TOTAL DEVELOPED AREA =157, 972 SF

TREATMENT REQUIRMENT (50% DEVELOPED AREA) = 78,986 SF

TOTAL TREATMENT PROVIDED = 80,594 SF

TREATMENT BMP	DEVELOPED AREA TREATED (SF)
VFF 1	14,050
VFF 2	11,496
VFF 3	34,500
BRC 1	10,548
BRC 2	10,000
TOTAL	**80,594 SF**

LEGEND

SUBBASIN BOUNDARY

DEVELOPED AREA BOUNDARY

AREA TREATED BY BMP

REV	DESCRIPTION	DATE

REISSUED FOR PERMITTING
7-24-20

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PORTLAND, MAINE

POST-DEVELOPMENT
WATER QUALITY PLAN

SHEET TITLE:

0 15' 30' 60' 90'

SCALE: 1" = 30'

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	JTA		
JOB CAPTAIN:	SDL		C-122
DRAWN BY:	WSM		
SMRT FILE:	C-121-19206	SHEET No.	

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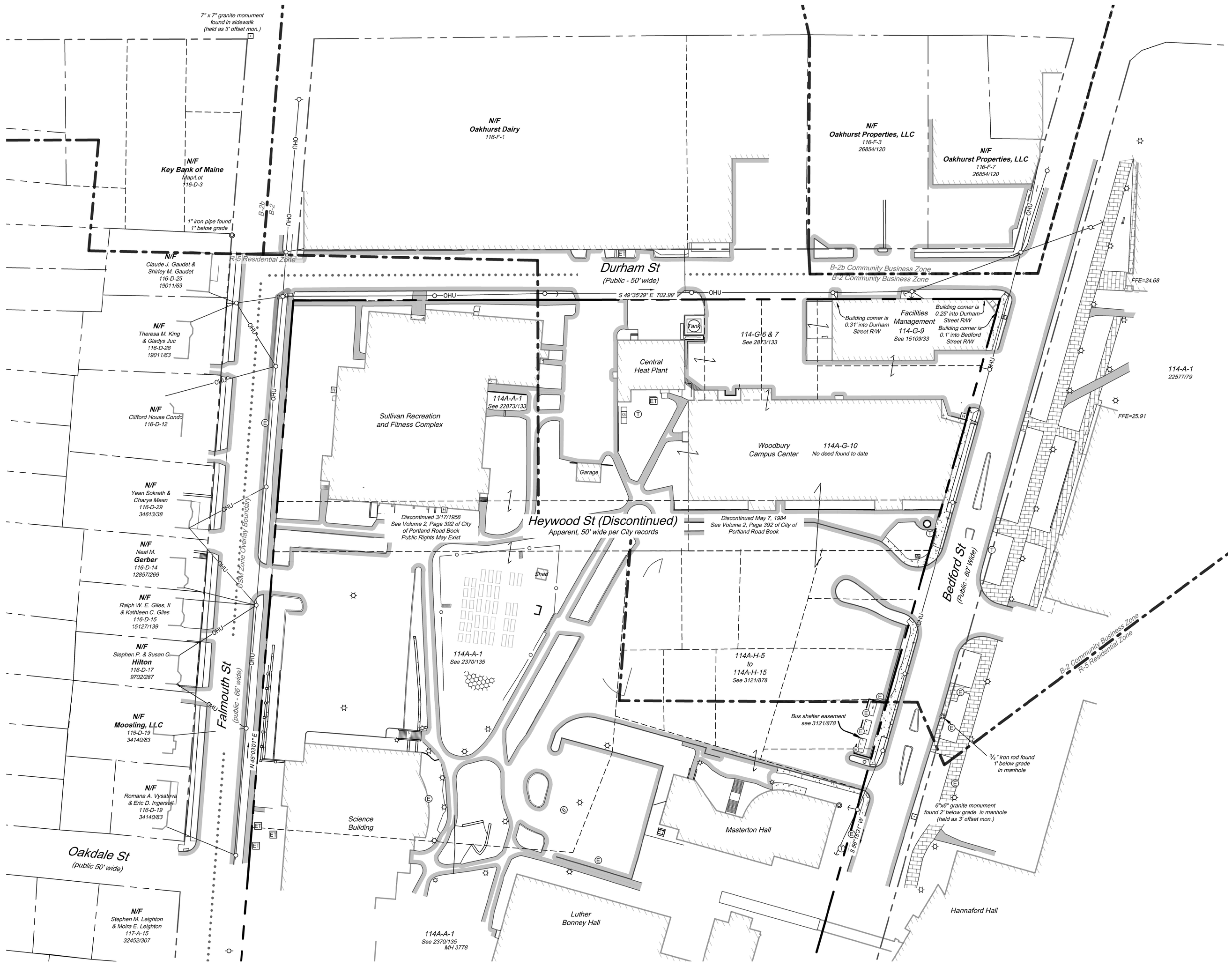

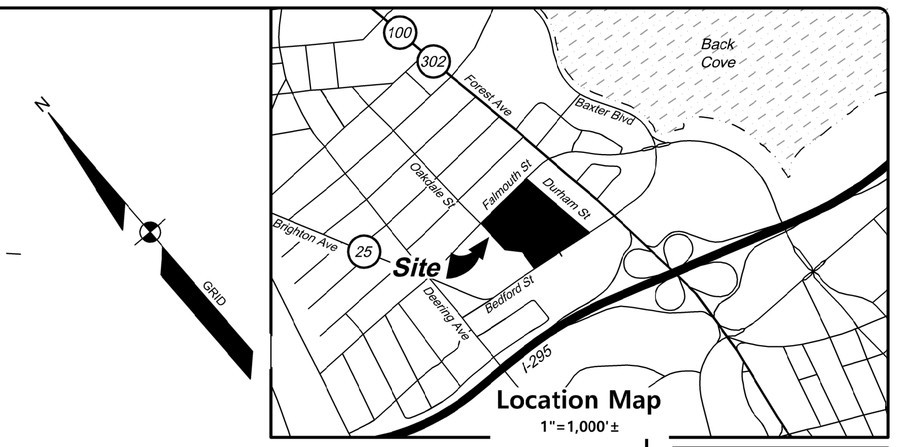

General Notes:

1. The purpose of this plan is show the results of a boundary retracement survey performed by SurveyWorks, Inc. in January 2020. This plan is for the sole use of the University of Southern Maine for the planning and design of a student success center and residence hall only and is not to be used by any other entity or persons. This is Sheet 1 of 3. This sheet only depicts information that may be relevant to a boundary survey. For more information regarding the existing conditions, topography and/or utilities within the project area, refer to Sheets 2 & 3.
2. All Book and Page numbers refer to the Cumberland County Registry of Deeds, unless otherwise noted.
3. The record owner of the subject parcel is the University of Maine System by various deeds listed hereon.
4. The subject parcel is shown on the City of Portland Parcel Viewer Maine Parcel Viewer as Parcel ID's 114A-A-001, 114A-G-006, 114A-G-007, 114A-G-009, 114A-G-010, & 114A-H-005 to114A-H-015 and are located in the B-2b Community Business & R-5 Residential Zone, as shown. All of the subject parcels are located in the "USM" Overlay Zone as well.
5. Plan References:
   - A. "Blue Sheets" for Falmouth Street, Bedford Street, Durham Street, Brighton Avenue & Forest Avenue on file at the City of Portland.
   - B. "University of Southern Maine, Portland Campus, Campus Center." Surveyed by Dennis P. Durgin, dated August 1983. Unrecorded.
   - C. "Plan made for Deering Heirs, February 5, 1925," prepared by E.C. Jordan & Co., supplemented November 1937. Unrecorded.
6. Plan orientation is Grid North, Maine State Plane Coordinate System, West Zone 1802-NAD83.
7. Underground utilities are shown based on markings provided by DigSmart at the time of survey. Utilities depicted hereon may not necessarily represent all existing utilities. Owners, contractors, and/or designers need to contac Dig-Safe Systems, Inc. (call 811) and field verify existing utilities prior to digging or breaking ground.

Legend:

Existing

- Property Line/R.O.W.
- Abutter Line/R.O.W.
- Deed/Plan Line/R.O.W.
- Tie Line
- Building Setback Line
- Easement Line
- Buffer Line
- Building
- Building Overhang
- Deck/Steps
- Edge of Pavement
- Edge of Concrete
- Pavement Paint
- Edge of Gravel
- Curb Line
- Chain Link Fence
- Guard Rail
- G — Gas Line
- W — Water Line
- S — Sewer Line
- FM — Force Main
- SD — Storm Drain
- UD — Under Drain
- OHU — Overhead Utilities
- UGU — Underground Utility
- Monument (as noted)
- Light Pole
- Utility Pole
- Guy Wire
- RipRap

STATE OF MAINE, Cumberland County, SS
REGISTRY OF DEEDS

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Plan Book _____, Page _____

Attest _____
Registrar

Surveyor's Statement:

This survey was performed under my direct supervision and to the best of my knowledge and belief, it was done in accordance with Chapter 90, Part 1 (Professional Standards of Practice) and Part 2 (Technical Standards of Practice) of the Maine Board of Licensure for Professional Land Surveyors.

Jimmy C. Courbron, PLS — 02/27/2020 Date

STATE OF MAINE
JIMMY C. COURBRON
No. PLS2532
PROFESSIONAL LAND SURVEYOR

Rev.	Date	Drawn	Checked	Note
02/14/20		DJH	JCC	Issued to Client for Review
02/18/20		DJH	JCC	Added notes at facilities management building
02/27/20		DJH	JCC	Updated utility information

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LAND SURVEYING CONSULTANTS
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7 Cobblestone Drive, Suite 4 Turner, ME 04282

Boundary Retracement Survey Plan
of a portion of
University of Southern Maine Campus
Bedford St, Durham St & Falmouth St
Portland, Maine
for Record Owner:
University of Maine System
5703 Alumni Hall
Orono, ME 04469

Project #19-4075
Date: 02/14/2020
Scale: 1" = 50'
Sheet No. 1 OF 1

Sheet Size: 24"X36"

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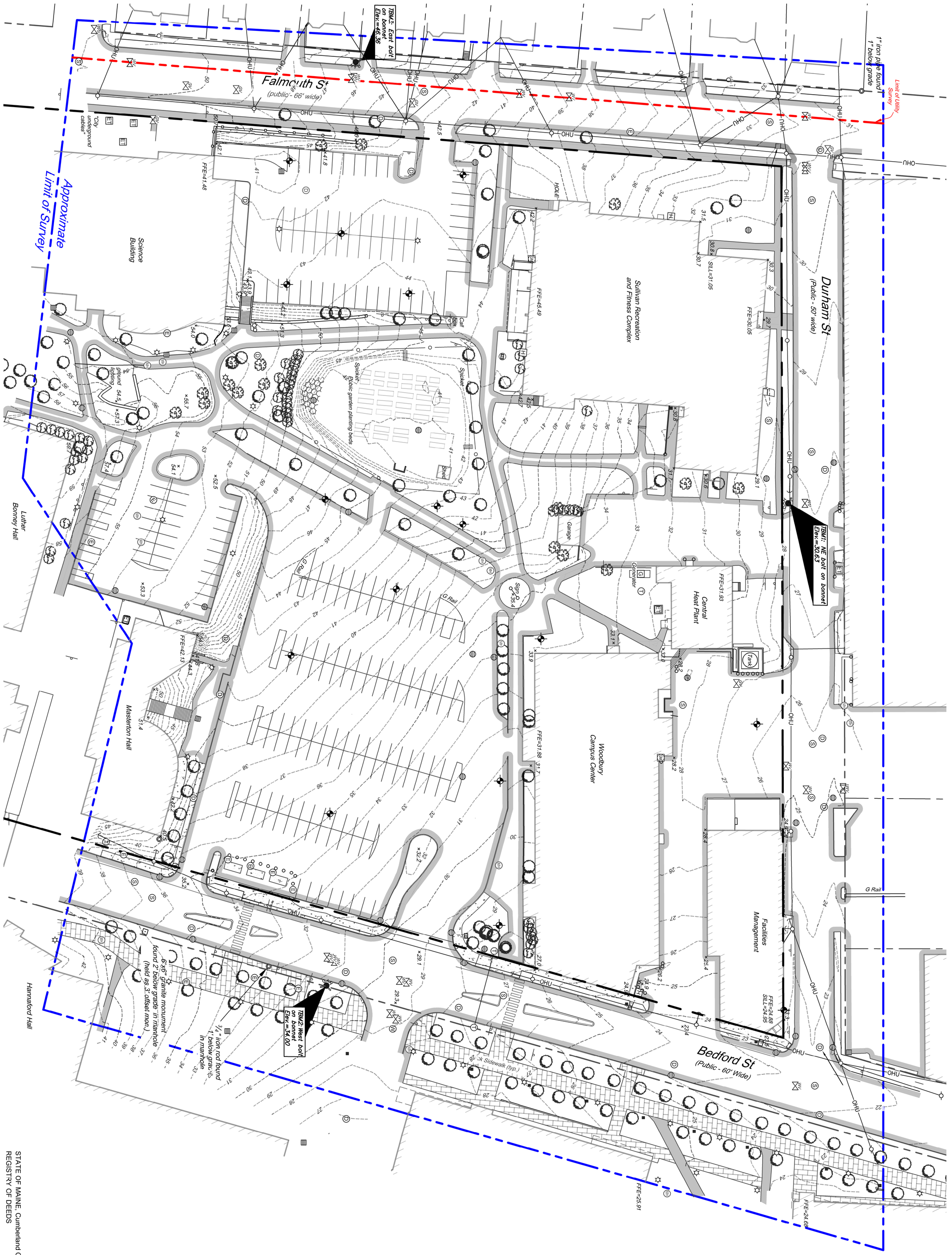


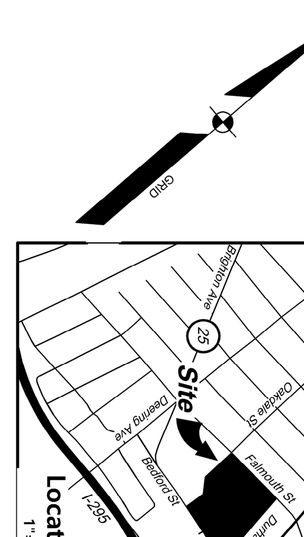
General Notes:

1. The purpose of this plan is show the results of an existing conditions survey of the project area performed by SurveyWorks, Inc. in January 2020. This plan is for the sole use of the University of Southern Maine for the planning and design of a student success center and residence hall only and is not to be used by any other entity or persons. This is Sheet 2 of 3 and does not depict any underground conduits, structure numbers or rim elevations. Please refer to Sheet 3, "Utility Plan" for these items as well as the associated structures spreadsheet with pipe and invert data, on file at SurveyWorks, Inc.
2. The subject parcel is shown on the City of Portland Parcel Viewer as Parcel ID's 114A-A-001, 114A-G-006, 114A-G-007, 114A-G-009, 114A-G-010, & 114A-H-005 to114A-H-015 and are located in the B-2b Community Business & R-5 Residential Zone, as shown. All of the subject parcels are located in the "USM" Overlay Zone as well.
3. Boundary & topographic information shown hereon is based on an on-the-ground survey performed by SurveyWorks, Inc. in January 2020.
4. Plan References:
   - A. "Blue Sheets" for Falmouth Street, Bedford Street, Durham Street, Brighton Avenue & Forest Avenue on file at the City of Portland.
   - B. "City of Portland Public Works Department Contract Drawings, Bedford Street Sewer Seperation Project, Portland Water District Main Replacement," issued for bid February 2018.
   - C. "University of Southern Maine, Portland Campus, Campus Center," Surveyed by Dennis P. Durgin, dated August 1983. Unrecorded.
   - D. Plan set, "University of Southern Maine Portland Campus Utilities Master Plan," HA Project No. 10584, prepared/compiled by Harriman Architects & Engineers, approximate dates of October 7, 2010 through April 28, 2011. Unrecorded.
5. Plan orientation is Grid North, Maine State Plane Coordinate System, West Zone 1802-NAD83. Elevations depicted hereon are based on the City of Portland's Datum approximating NGVD29 based on a benchmark found under a manhole cover at the intersection of Bedford Street and the former location of Winslow Street.
6. The subject parcel is located within Zone X, Areas of Minimal Flood Hazard, as delineated on the Flood Insurance Rate Map for the City of Portland, Cumberland County, Community-Panel Number 2300510003B, having an Effective Date of July 17, 1986.
7. Underground utilities depicted hereon are based on markings provided by Dig Smart of Maine, Inc. at the time of survey. Utilities depicted hereon may not necessarily represent all existing utilities. Owners, contractors, and/or designers need to contact Dig-Safe Systems, Inc. (call 811) and field verify existing utilities prior to digging or breaking ground.

Legend:

Existing

- Property Line/R.O.W.
- Abutter Line/R.O.W.
- Deed/Plan Line/R.O.W.
- Tie Line
- Building Setback Line
- Easement Line
- Buffer Line
- Building
- Building Overhang
- Deck/Steps
- Edge of Pavement
- Edge of Concrete
- Pavement Paint
- Edge of Gravel
- Curb Line
- Major Contour
- Minor Contour
- Spot Elevation
- Chain Link Fence
- Guard Rail
- Overhead Utilities
- Monument (as noted)
- Bollard
- Sign
- Gas Gate Valve
- Gas Meter
- Gas Manhole
- Water Gate Valve
- Hydrant
- Sewer Manhole
- Drainage Manhole
- Catch Basin
- Yard Drain w/ Beehive Grate
- Transformer Pad
- Electrical Manhole
- Electric Meter
- HVAC Unit
- Telephone Manhole
- Light Pole
- Utility Pole
- Guy Wire
- RipRap
- Proposed Boring Location



STATE OF MAINE, Cumberland County, SS
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At ___ h ___ m ___M and recorded in

Plan Book _____, Page _____

Attest _____

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Sheet Size: 24" X 36"

Existing Conditions & Topographic Survey
of a portion of
University of Southern Maine Campus
Bedford St, Durham St & Falmouth St
Portland, Maine
for Record Owner:
University of Maine System
5703 Alumni Hall
Orono, ME 04469

Rev. Date	Drawn	Checked	Note
02/14/20	DJH	JCC	Issued to Client for Review
02/18/20	DJH	JCC	Corrected note 7 and minor cosmetic changes
02/27/20	DJH	JCC	Updated utility information

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STATE OF MAINE
JIMMY C. COURBRON
No. PLS2532
PROFESSIONAL LAND SURVEYOR

Project #19-4075
Date: 02/14/2020
Scale: 1" = 40'
Sheet No. 2 OF 3

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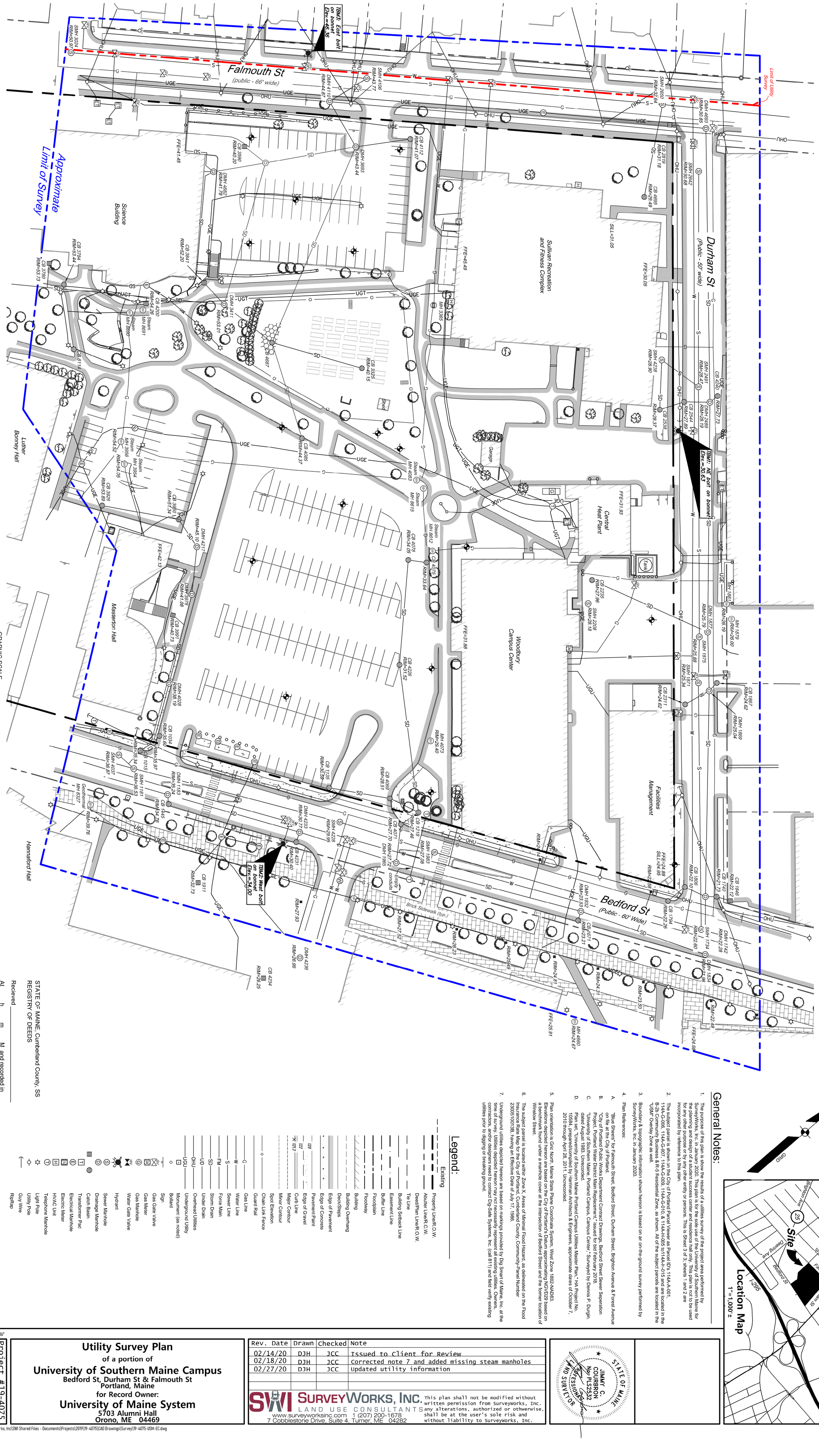

General Notes:

1. The purpose of this plan is show the results of a utilities survey of the project area performed by SurveyWorks, Inc. in January 2020. This plan is for the sole use of the University of Southern Maine for the planning and design of a student success center and residence hall only. This plan is not to be used for any other purpose or by any other entity or persons. This is Sheet 3 of 3; sheets 1 and 2 are incorporated by reference to this plan.
2. The subject parcel is shown on the City of Portland Parcel Viewer as Parcel ID's 114A-A-001, 114A-G-006, 114A-G-007, 114A-G-009, 114A-G-010, & 114A-H-005 to 114A-H-015 and are located in the B-2b Community Business & R-5 Residential Zone, as shown. All of the subject parcels are located in the "USM" Overlay Zone as well.
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6. The subject parcel is located within Zone X, Areas of Minimal Flood Hazard, as delineated on the Flood Insurance Rate Map for the City of Portland, Cumberland County, Community-Panel Number 2305100013B, having an Effective Date of July 17, 1986.
7. Underground utilities depicted hereon are based on markings provided by Dig Smart of Maine, Inc. at the time of survey. Utilities depicted hereon may not necessarily represent all existing utilities. Owners, contractors, and/or designers need to contact Dig-Safe Systems, Inc. (call 811) and field verify existing utilities prior to digging or breaking ground.

Legend:

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- Deed/Plan Line/R.O.W.
- Tie Line
- Building Setback Line
- Easement Line
- Buffer Line
- Floodplain
- Floodway
- Building
- Building Overhang
- Deck/Steps
- Edge of Pavement
- Edge of Concrete
- Pavement Paint
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- Force Main
- Storm Drain
- Under Drain
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- Gas Meter
- Gas Manhole
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- Hydrant
- Sewer Manhole
- Drainage Manhole
- Catch Basin
- Transformer Pad
- Electrical Manhole
- Electric Meter
- HVAC Unit
- Telephone Manhole
- Light Pole
- Utility Pole
- Guy Wire
- RipRap

Location Map
1"=1,000'±

STATE OF MAINE, Cumberland County, SS
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No. PLS2532
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF MAINE

Rev.	Date	Drawn	Checked	Note
	02/14/20	DJH	JCC	Issued to Client for Review
	02/18/20	DJH	JCC	Corrected note 7 and added missing steam manholes
	02/27/20	DJH	JCC	Updated utility information

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Utility Survey Plan

of a portion of

University of Southern Maine Campus

Bedford St, Durham St & Falmouth St
Portland, Maine
for Record Owner:

University of Maine System

5703 Alumni Hall
Orono, ME 04469

Sheet Size: 24" X 36"

Project #19-4075
Date: 02/14/2020
Scale: 1" = 40'
Sheet No. 3 OF 3

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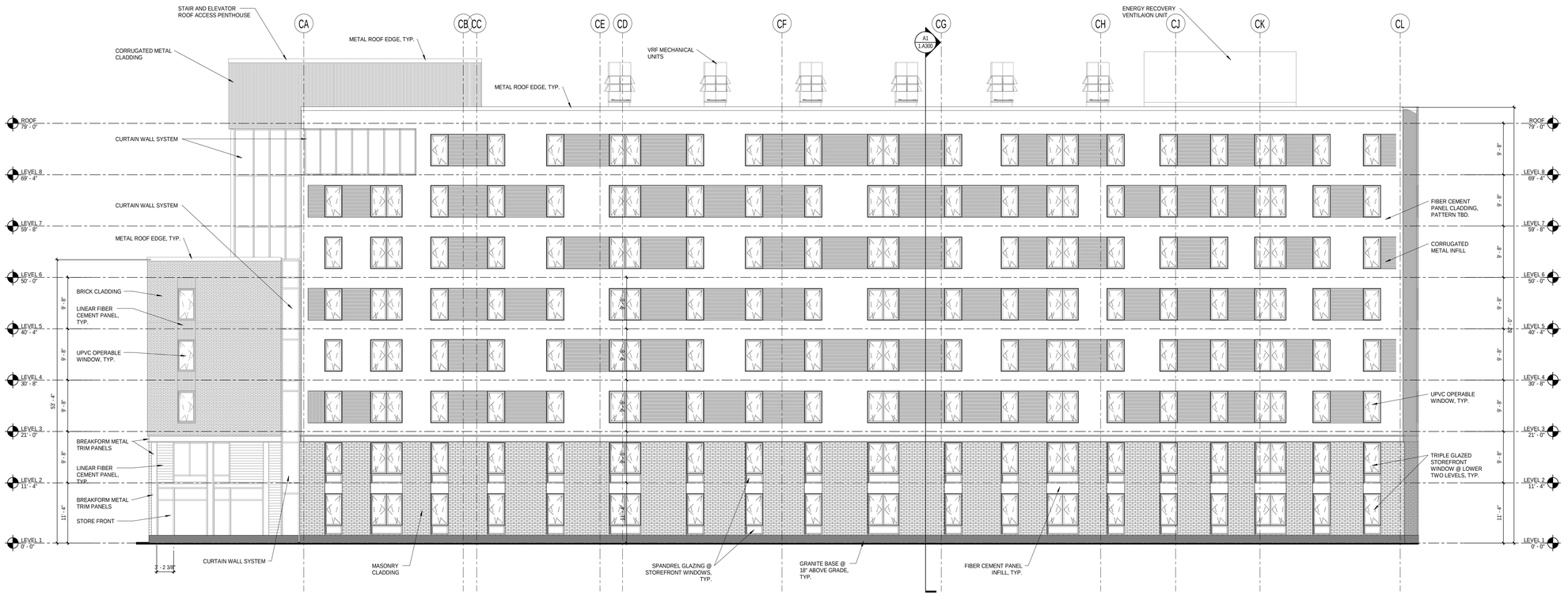
EXTERIOR ELEVATION - SOUTH K1
1/8" = 1'-0"



EXTERIOR ELEVATION - EAST A1
1/8" = 1'-0"

REV	DESCRIPTION	DATE

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UNIVERSITY OF SOUTHERN MAINE
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Portland, ME

EXTERIOR ELEVATIONS

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	PDC		
JOB CAPTAIN:	SDL		1.A200
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A200-19206	SHEET No.	

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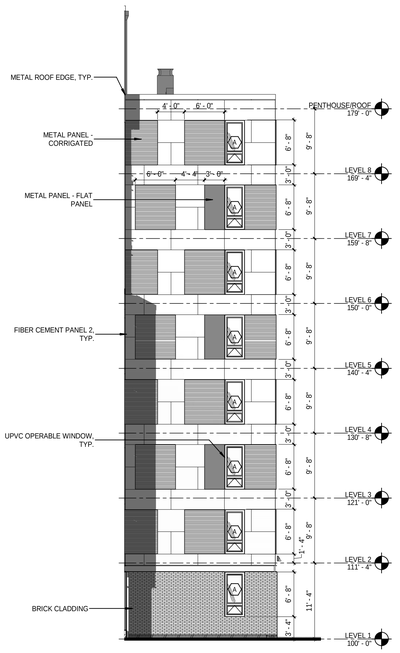
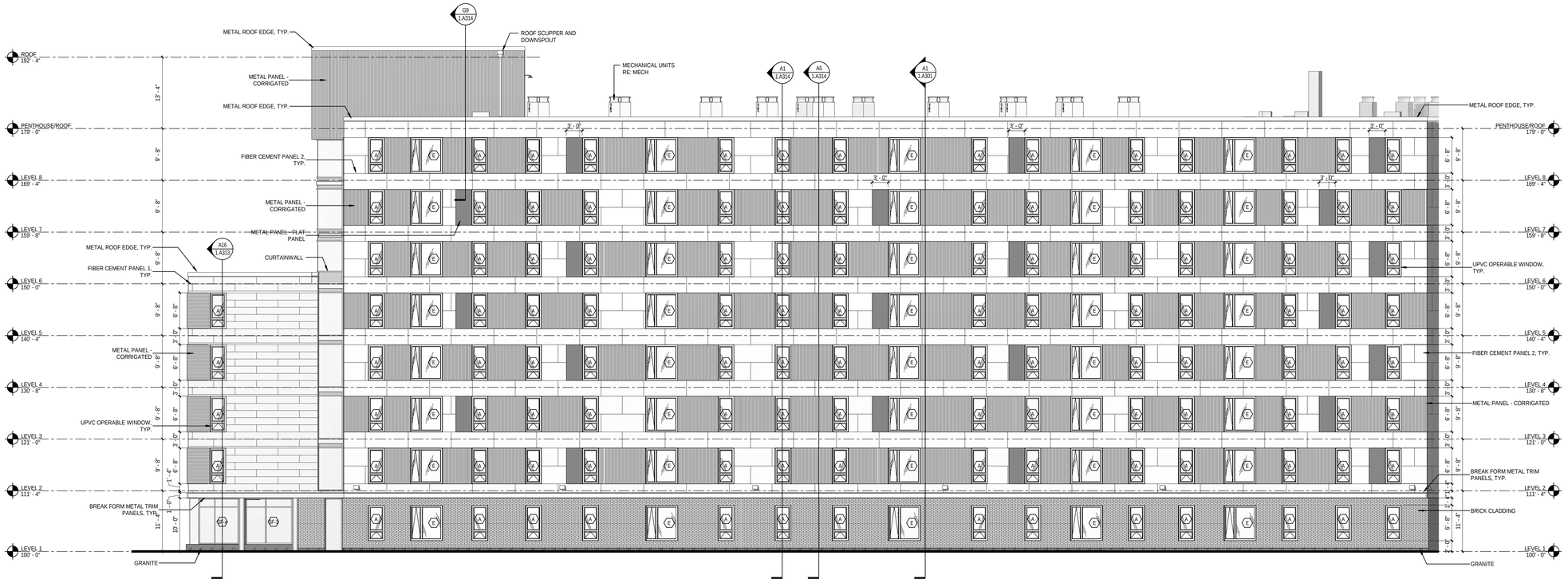
SOUTH ELEVATION - BEDFORD STREET J6
1/8" = 1'-0"



SOUTH ELEVATION - PARTIAL J1
1/8" = 1'-0"

ELEVATION NOTES:

1. REFER TO FIRE PROTECTION, MECHANICAL, PLUMBING, ELECTRICAL DRAWINGS FOR ALL RESPECTIVE FIXTURE/ DEVICE LOCATIONS, COUNTS, & ASSOCIATED RECESSED BOXES AT EXTERIOR WALLS.
2. SEE SPECIFICATIONS FOR PREPARATION OF WALL MOUNTING SURFACE FOR INSTALLATION OF EXTERIOR FIXTURES.
3. PROVIDE MASONRY CONTROL JOINTS AT ALL INSIDE MASONRY CORNERS AND ALIGN WITH OPENINGS WHEN POSSIBLE.



EAST ELEVATION - DURHAM STREET A1
1/8" = 1'-0"

REV	DESCRIPTION	DATE

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PROJECT LOCATION

EXTERIOR ELEVATIONS
SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	PDC		
JOB CAPTAIN:	SDL		
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A201-19206	SHEET No.	1.A201

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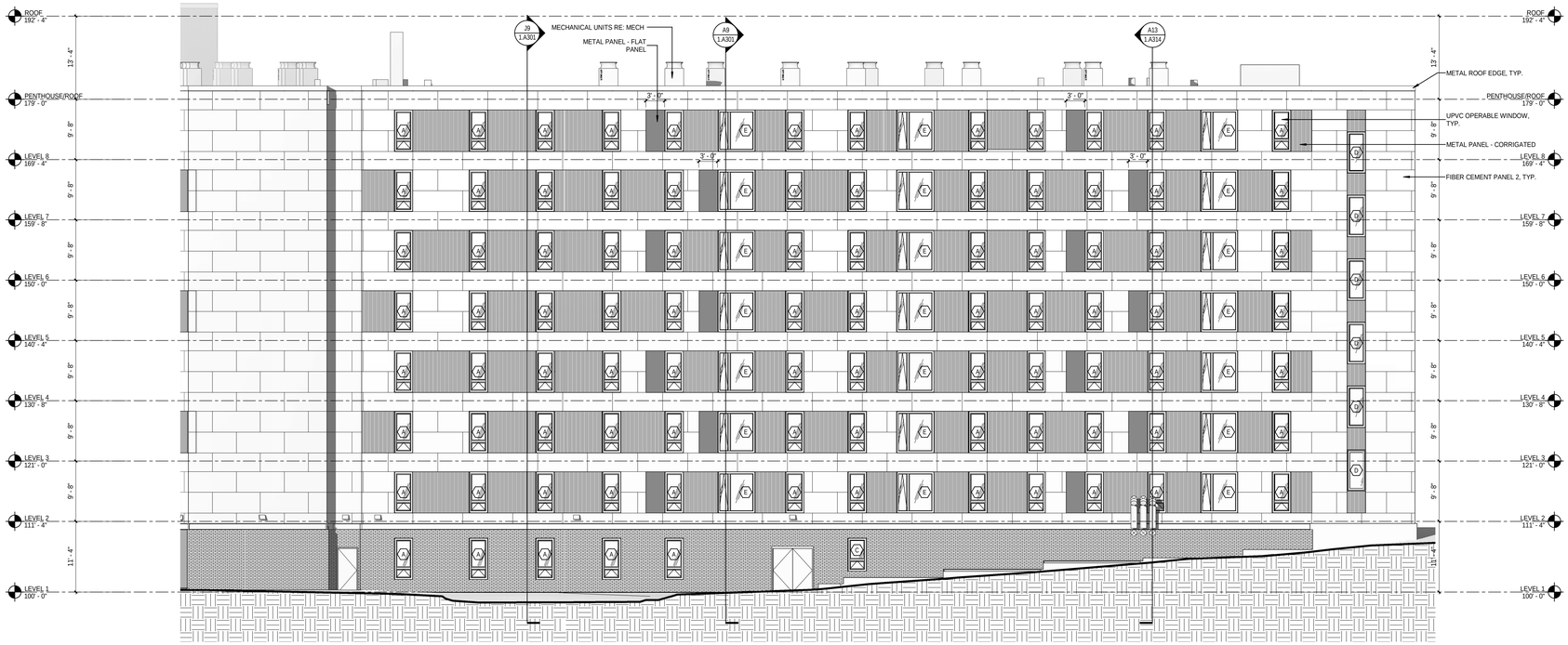
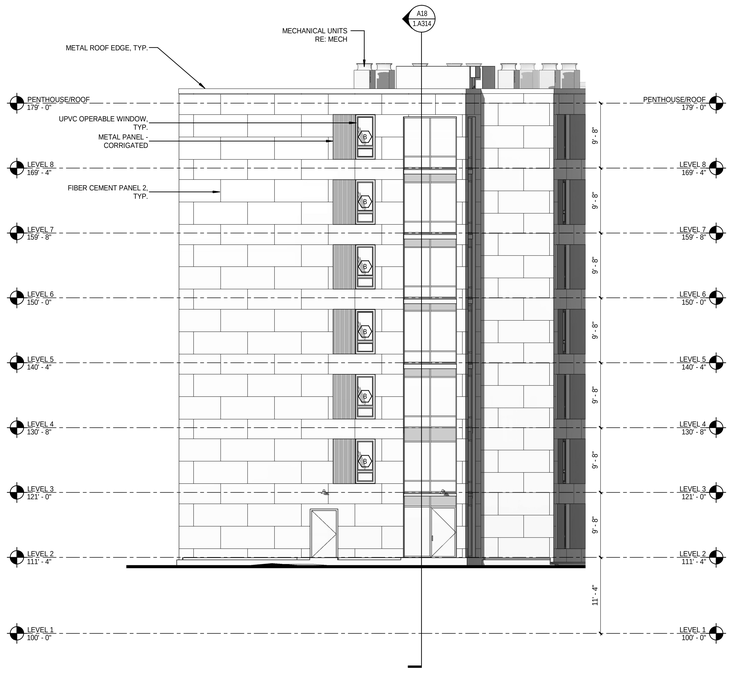


NORTH ELEVATION J1
1/8" = 1'-0"



WEST ELEVATION A14
1/8" = 1'-0"



WEST ELEVATION A1
1/8" = 1'-0"

ELEVATION NOTES:

1. REFER TO FIRE PROTECTION, MECHANICAL, PLUMBING, ELECTRICAL DRAWINGS FOR ALL RESPECTIVE FIXTURE/ DEVICE LOCATIONS, COUNTS, & ASSOCIATED RECESSED BOXES AT EXTERIOR WALLS.
2. SEE SPECIFICATIONS FOR PREPARATION OF WALL MOUNTING SURFACE FOR INSTALLATION OF EXTERIOR FIXTURES.
3. PROVIDE MASONRY CONTROL JOINTS AT ALL INSIDE MASONRY CORNERS AND ALIGN WITH OPENINGS WHEN POSSIBLE.

REV	DESCRIPTION	DATE

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PROJECT LOCATION

EXTERIOR ELEVATIONS

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	PDC		
JOB CAPTAIN:	SDL		1.A202
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A202-19206	SHEET No.	

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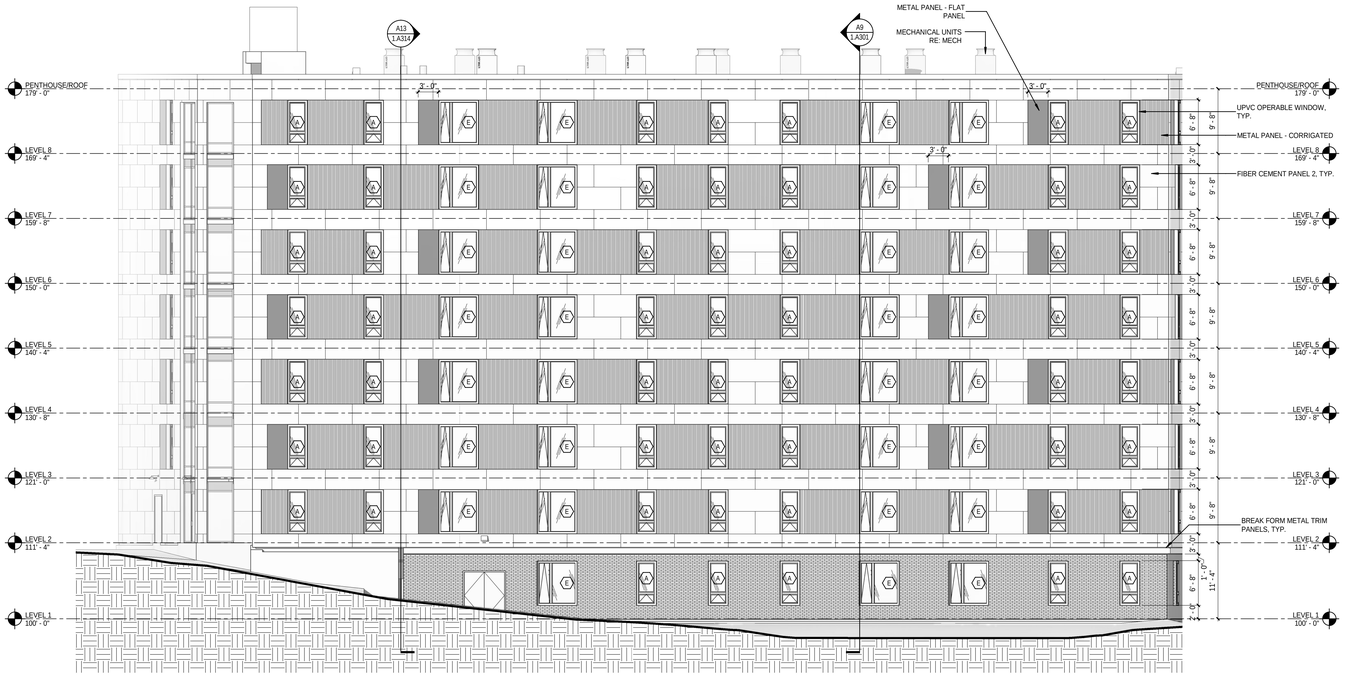
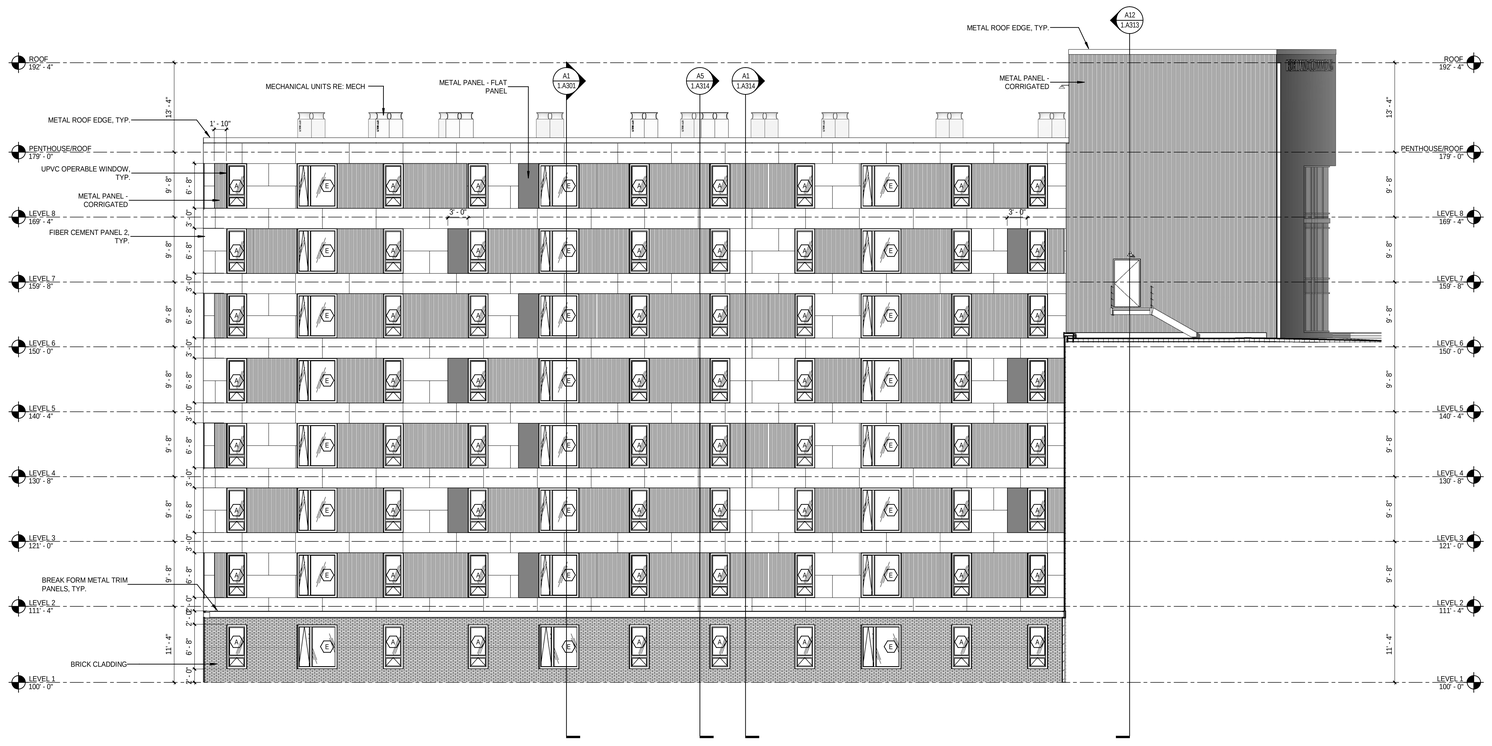


SOUTH ELEVATION - COURTYARD J1
1/8" = 1'-0"



WEST ELEVATION - COURTYARD A1
1/8" = 1'-0"

ELEVATION NOTES:

1. REFER TO FIRE PROTECTION, MECHANICAL, PLUMBING, ELECTRICAL DRAWINGS FOR ALL RESPECTIVE FIXTURE/ DEVICE LOCATIONS, COUNTS, & ASSOCIATED RECESSED BOXES AT EXTERIOR WALLS.
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PROJECT LOCATION

EXTERIOR ELEVATIONS
SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	PDC		
JOB CAPTAIN:	SDL		1.A203
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A203-19206	SHEET No.	

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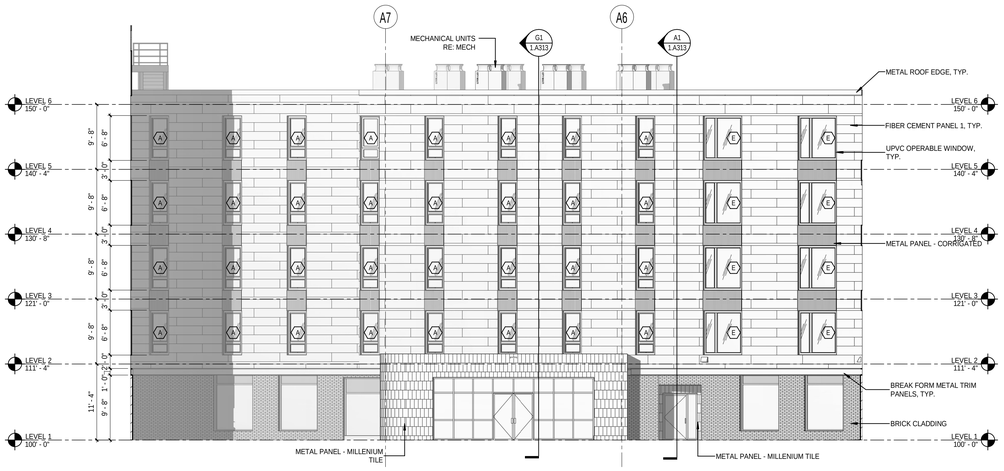
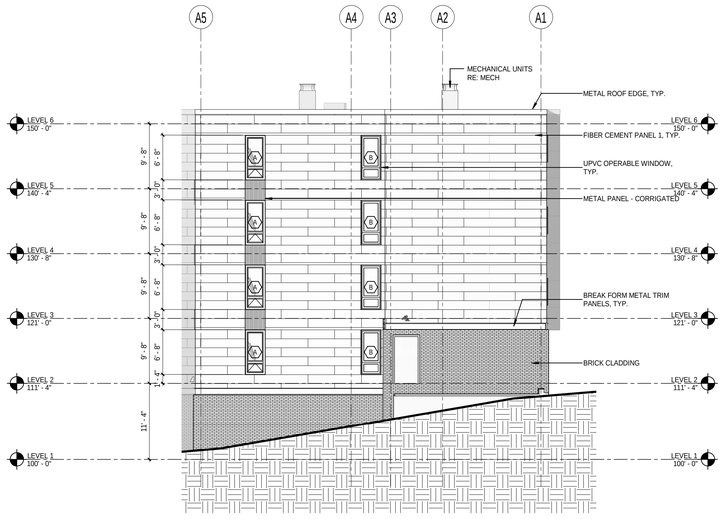


NORTH ELEVATION - COURTYARD J11
1/8" = 1'-0"



EAST ELEVATION - COURTYARD J1
1/8" = 1'-0"



NORTH ELEVATION - PARTIAL A1
1/8" = 1'-0"

ELEVATION NOTES:

1. REFER TO FIRE PROTECTION, MECHANICAL, PLUMBING, ELECTRICAL DRAWINGS FOR ALL RESPECTIVE FIXTURE/ DEVICE LOCATIONS, COUNTS, & ASSOCIATED RECESSED BOXES AT EXTERIOR WALLS.
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UNIVERSITY OF SOUTHERN MAINE
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PROJECT LOCATION

EXTERIOR ELEVATIONS
SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	PDC		
JOB CAPTAIN:	SDL		
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A204-19206	SHEET No.	1.A204

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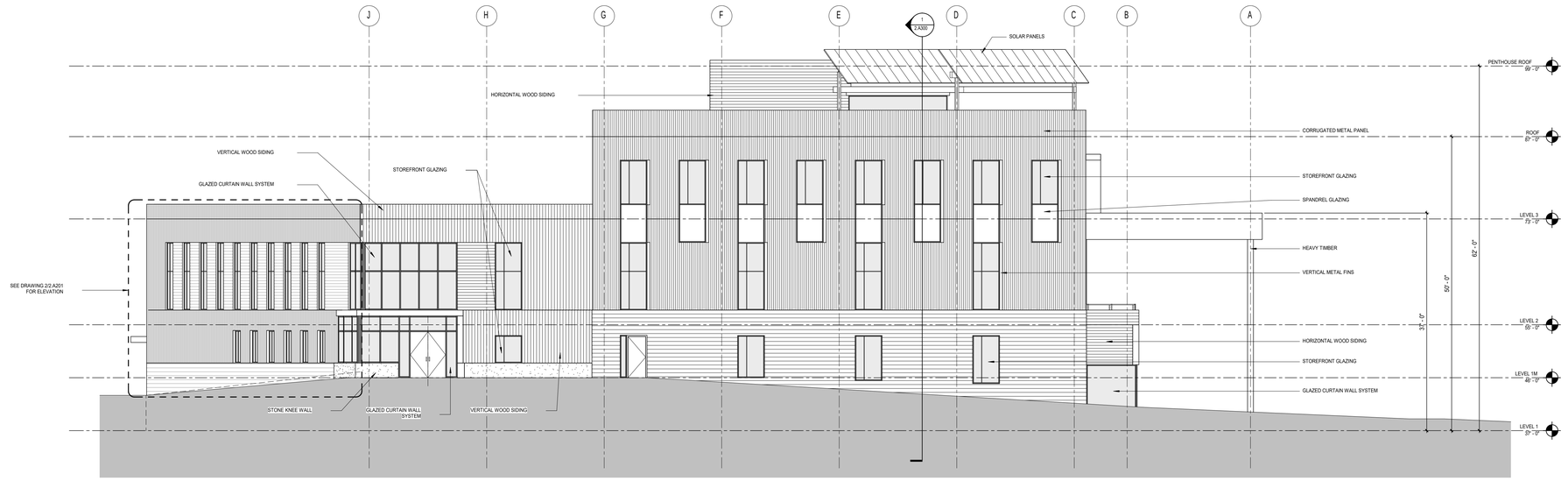
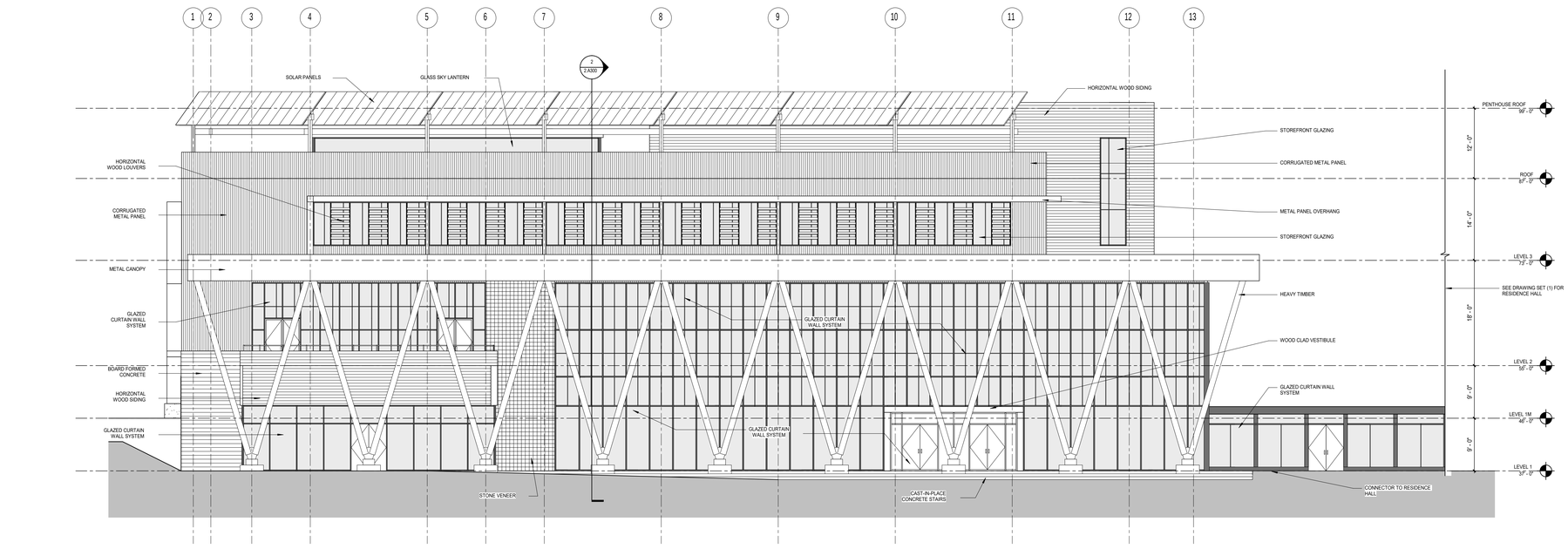


SOUTHWEST
1/8" = 1'-0"
2



SOUTHEAST
1/8" = 1'-0"
1

REV.	DESCRIPTION	DATE

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3-06-20
CURRENT ISSUE STATUS:

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CAREER AND STUDENT SUCCESS CENTER & RESIDENCE HALL
PROJECT LOCATION:

EXTERIOR ELEVATIONS
SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	Checker		
JOB CAPTAIN:	KD		2.A200
DRAWN BY:	Author		
SMRT FILE:	2.A200-19206	SHEET No.	

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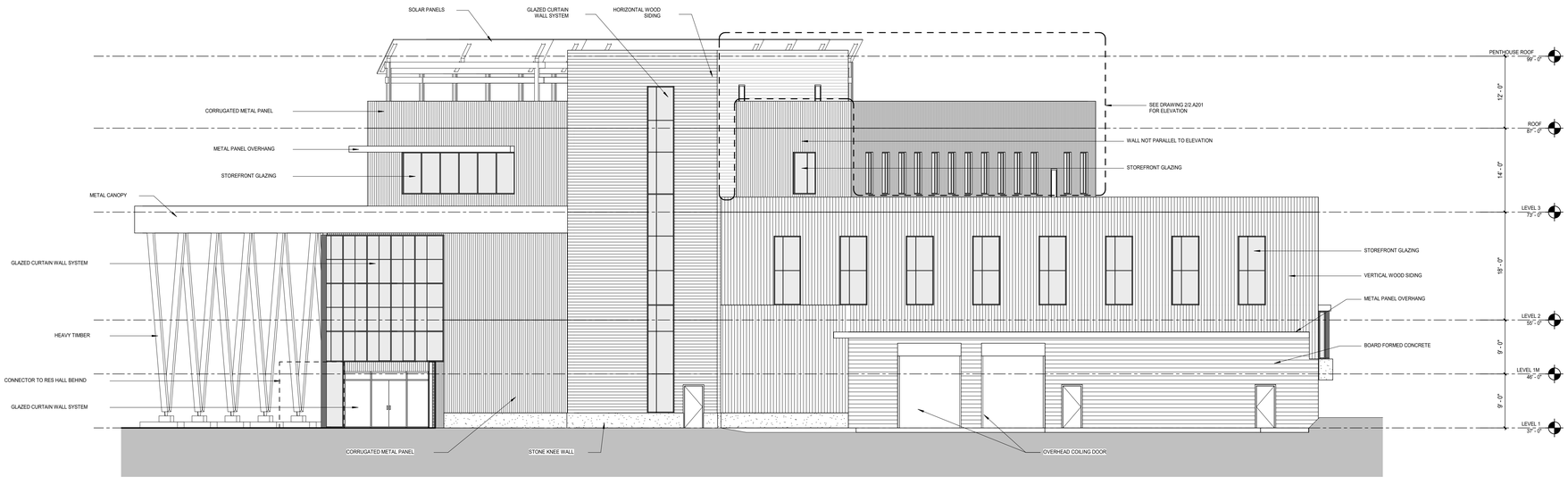
NORTHWEST
1/8" = 1'-0"
2



NORTHEAST
1/8" = 1'-0"
1

REV	DESCRIPTION	DATE

ISSUED FOR SD AND PERMITTING
3-06-20

CURRENT ISSUE STATUS:

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PROJECT LOCATION

EXTERIOR ELEVATIONS

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	Checker		
JOB CAPTAIN:	KD		2.A201
DRAWN BY:	Author		
SMRT FILE:	2.A201-19206	SHEET No.	

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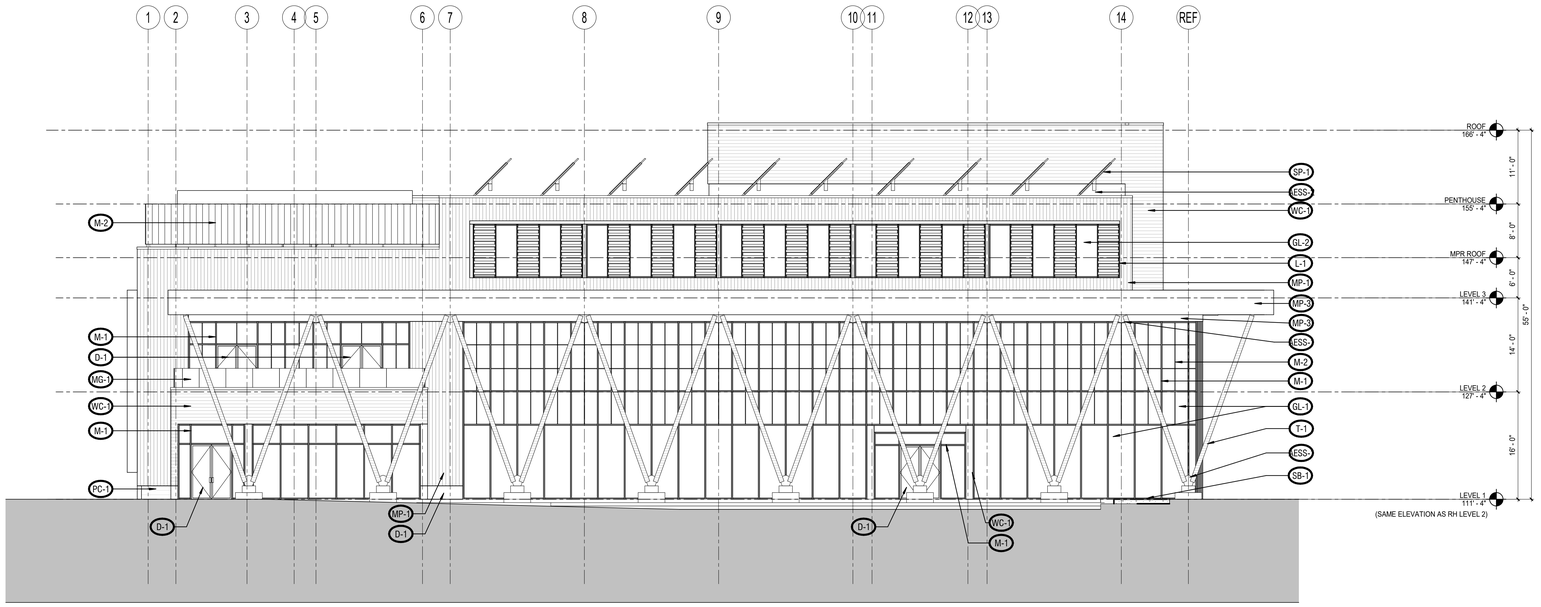
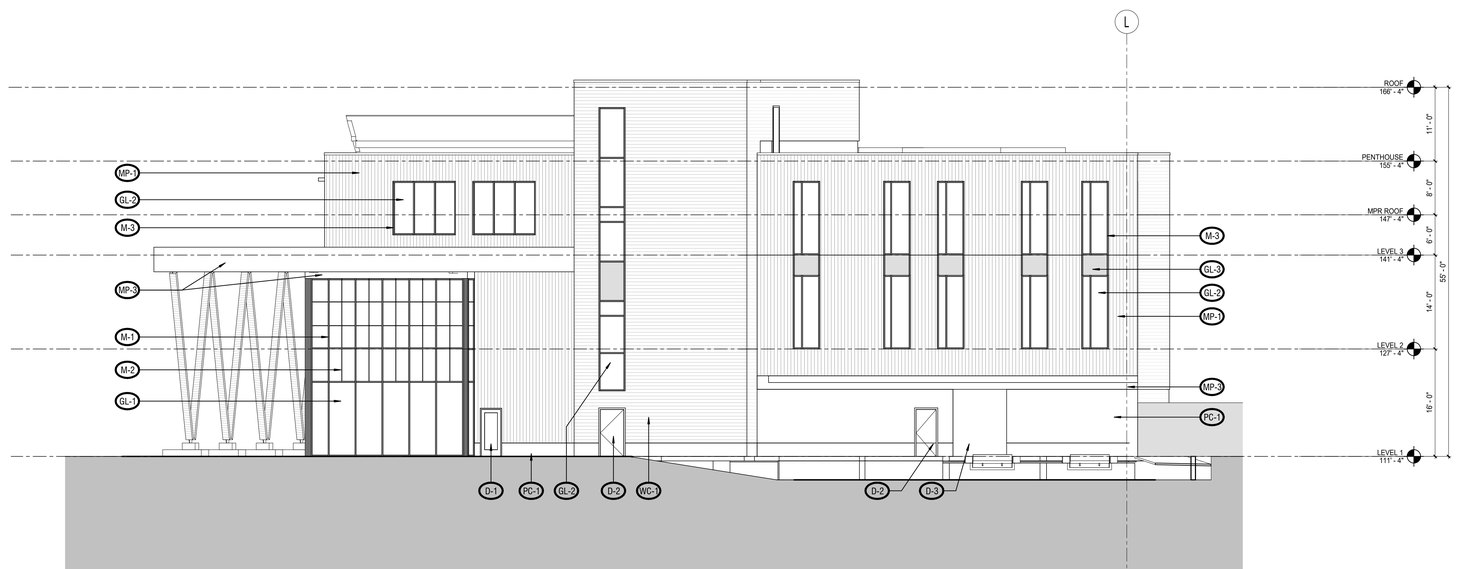


(SAME ELEVATION AS RH LEVEL 2)

South Elevation J6
1/8" = 1'-0"



East Elevation B6
1/8" = 1'-0"

ELEVATION KEY NOTE

NOTE:
SEE EXTERIOR MATERIALS FINISH SCHEDULE ON A200FS FOR COLOR AND FINISH OF EACH KEY NOTE EXTERIOR MATERIAL

TAG	MATERIAL	DESCRIPTION
ESS-1	EXPOSED STRUCTURAL STEEL (PAINTED)	EXPOSED STRUCTURAL STEEL (EXPOSED TO VIEW)
ESS-2	EXPOSED STRUCTURAL STEEL	SOLAR PANEL & SCREEN WALL FRAMING
CP-1	ALUMINUM COPING CAP	
CP-2	ALUMINUM COPING CAP	
D-1	ALUM. FRAMED GLASS DOOR AT CURTAINWALL	HEAVY DUTY ALUM FRAMED DOOR WITH 1" INSULATING GLASS
D-2	HOLLOW METAL DOOR TYPE 1	INSULATED HOLLOW METAL DOOR
D-3	OVERHEAD COILING DOOR	
GL-1	GLAZING TYPE 1	
GL-2	GLAZING TYPE 2	
GL-3	GLAZING TYPE 3	
L-1	WOOD LOUVER TYPE 1	
M-1	CURTAINWALL MULLION TYPE 1	
M-2	CURTAINWALL MULLION TYPE 2	
M-3	CURTAINWALL MULLION TYPE 3	
MG-1	METAL GUARDRAIL	
MP-1	METAL PANEL TYPE 1	CORRUGATED METAL PANEL
MP-2	METAL PANEL TYPE 2	SCREEN WALL
MP-3	METAL PANEL TYPE 3	FLAT METAL WALL PANELS
PC-1	PRECAST CONCRETE	
S-1	SIGNAGE	N.I.C. (BY TENANT)
SB-1	STAINLESS STEEL	STAINLESS STEEL BASE
SP-1	SOLAR PANELS	
SBX	SHADOW BOX ASSEMBLY	TYPE GL-1 GLAZING, ALUMINUM PANEL, INTEGRAL INSULATION AND GALVANIZED STEEL AIR SEAL SHEET (REFER TO PROJECT SPEC. AND DETAILS ON A410-A419)
T-1	TIMBER COLUMNS	8" x 8"
WC-1	RAINSCREEN WOOD SIDING	BASIS OF DESIGN - CAMBIA THERMALLY MODIFIED POPLAR SIDING IN CLIP PROFILE

GENERAL NOTE

1. ALL CURTAINWALL SYSTEM TO BE UNITIZED ALUM. CURTAINWALL WITH HIGH THERMAL PERFORMANCE, REFER TO PROJECT SPECIFICATION FOR DESIGN AND PERFORMANCE CRITERIA.

2. REFER TO PROJECT SPECIFICATION FOR DESIGN AND PERFORMANCE CRITERIA OF GROUND FLOOR STOREFRONT SYSTEM.

3. REFER TO PROJECT SPECIFICATION FOR ASSEMBLY OF GLAZING TYPES 1-6

4. REFER TO PROJECT SPECIFICATION AND PROJECT DETAILS FOR UNITIZED CURTAIN WALL AND STOREFRONT MULLION CONFIGURATIONS, ASSEMBLIES AND PERFORMANCE CRITERIA

REV	DESCRIPTION	DATE

PROGRESS
07-26-20
CURRENT ISSUE STATUS:

PROJECT NORTH:

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www.elkus-manfredi.com

UNIVERSITY OF SOUTHERN MAINE
CAREER AND STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

EXTERIOR ELEVATIONS

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	XXX	PROJECT NO:	00000
A/E OF RECORD:	Checker	SHEET No.	2.A201
JOB CAPTAIN:	XXX		
DRAWN BY:	Author		
SMRT FILE:	2.A201-00000		

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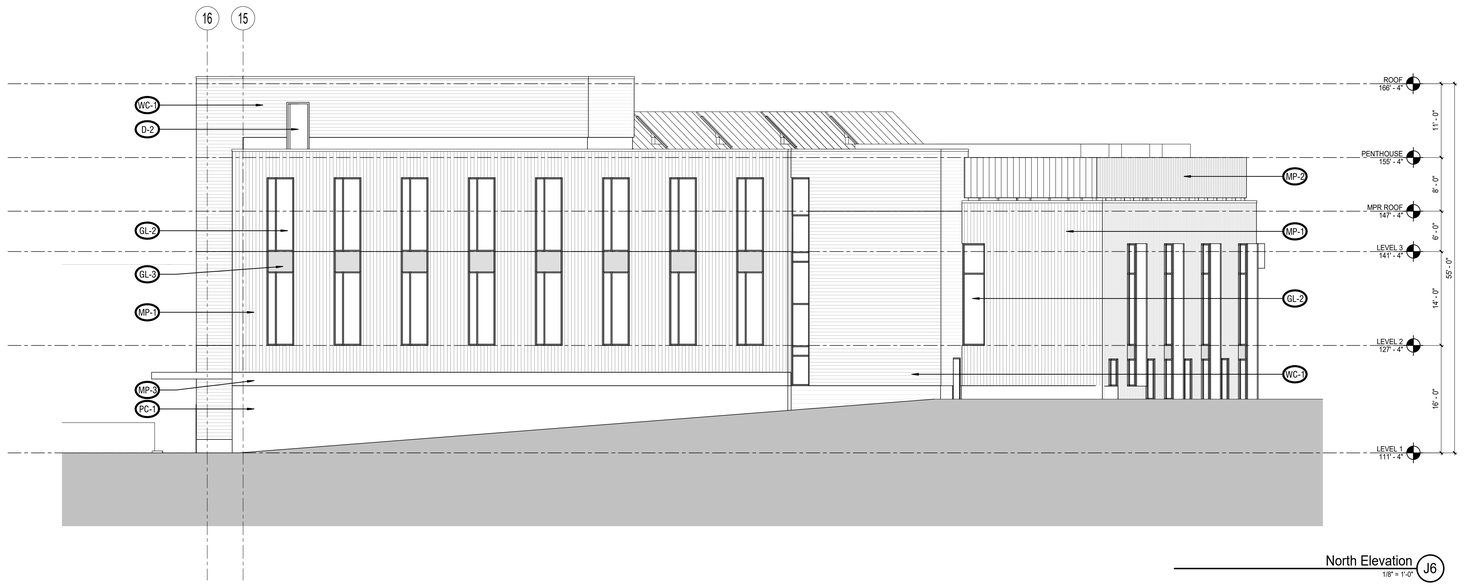

North Elevation J6
1/8" = 1'-0"



West Elevation B6
1/8" = 1'-0"

ELEVATION KEY NOTE

NOTE:
SEE EXTERIOR MATERIALS FINISH SCHEDULE ON A200FS FOR COLOR AND FINISH OF EACH KEY NOTE EXTERIOR MATERIAL

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CP-1	ALUMINUM COPING CAP	
CP-2	ALUMINUM COPING CAP	
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D-2	HOLLOW METAL DOOR TYPE 1	INSULATED HOLLOW METAL DOOR
D-3	OVERHEAD COILING DOOR	
GL-1	GLAZING TYPE 1	
GL-2	GLAZING TYPE 2	
GL-3	GLAZING TYPE 3	
L-1	WOOD LOUVER TYPE 1	
M-1	CURTAINWALL MULLION TYPE 1	
M-2	CURTAINWALL MULLION TYPE 2	
M-3	CURTAINWALL MULLION TYPE 3	
MG-1	METAL GUARDRAIL	
MP-1	METAL PANEL TYPE 1	CORRUGATED METAL PANEL
MP-2	METAL PANEL TYPE 2	SCREEN WALL
MP-3	METAL PANEL TYPE 3	FLAT METAL WALL PANELS
PC-1	PRECAST CONCRETE	
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SB-1	STAINLESS STEEL	STAINLESS STEEL BASE
SP-1	SOLAR PANELS	
SBX	SHADOW BOX ASSEMBLY	TYPE GL-1 GLAZING, ALUMINUM PANEL, INTEGRAL INSULATION AND GALVANIZED STEEL AIR SEAL SHEET (REFER TO PROJECT SPEC. AND DETAILS ON A410-A419)
T-1	TIMBER COLUMNS	8" x 8"
WC-1	RAINSCREEN WOOD SIDING	BASIS OF DESIGN - CAMBIA THERMALLY MODIFIED POPLAR SIDING IN CLIP PROFILE

GENERAL NOTE

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2. REFER TO PROJECT SPECIFICATION FOR DESIGN AND PERFORMANCE CRITERIA OF GROUND FLOOR STOREFRONT SYSTEM.

3. REFER TO PROJECT SPECIFICATION FOR ASSEMBLY OF GLAZING TYPES 1-6

4. REFER TO PROJECT SPECIFICATION AND PROJECT DETAILS FOR UNITIZED CURTAIN WALL AND STOREFRONT MULLION CONFIGURATIONS, ASSEMBLIES AND PERFORMANCE CRITERIA

REV	DESCRIPTION	DATE

PROGRESS
07-26-20
CURRENT ISSUE STATUS:

PROJECT NORTH:

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CAREER AND STUDENT SUCCESS CENTER & PORTLAND COMMONS
PROJECT LOCATION

EXTERIOR ELEVATIONS
SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

PROJECT MANAGER:	XXX	PROJECT NO:	00000
A/E OF RECORD:	Checker		
JOB CAPTAIN:	XXX		2.A202
DRAWN BY:	Author		
SMRT FILE:	2.A202-00000	SHEET No.	

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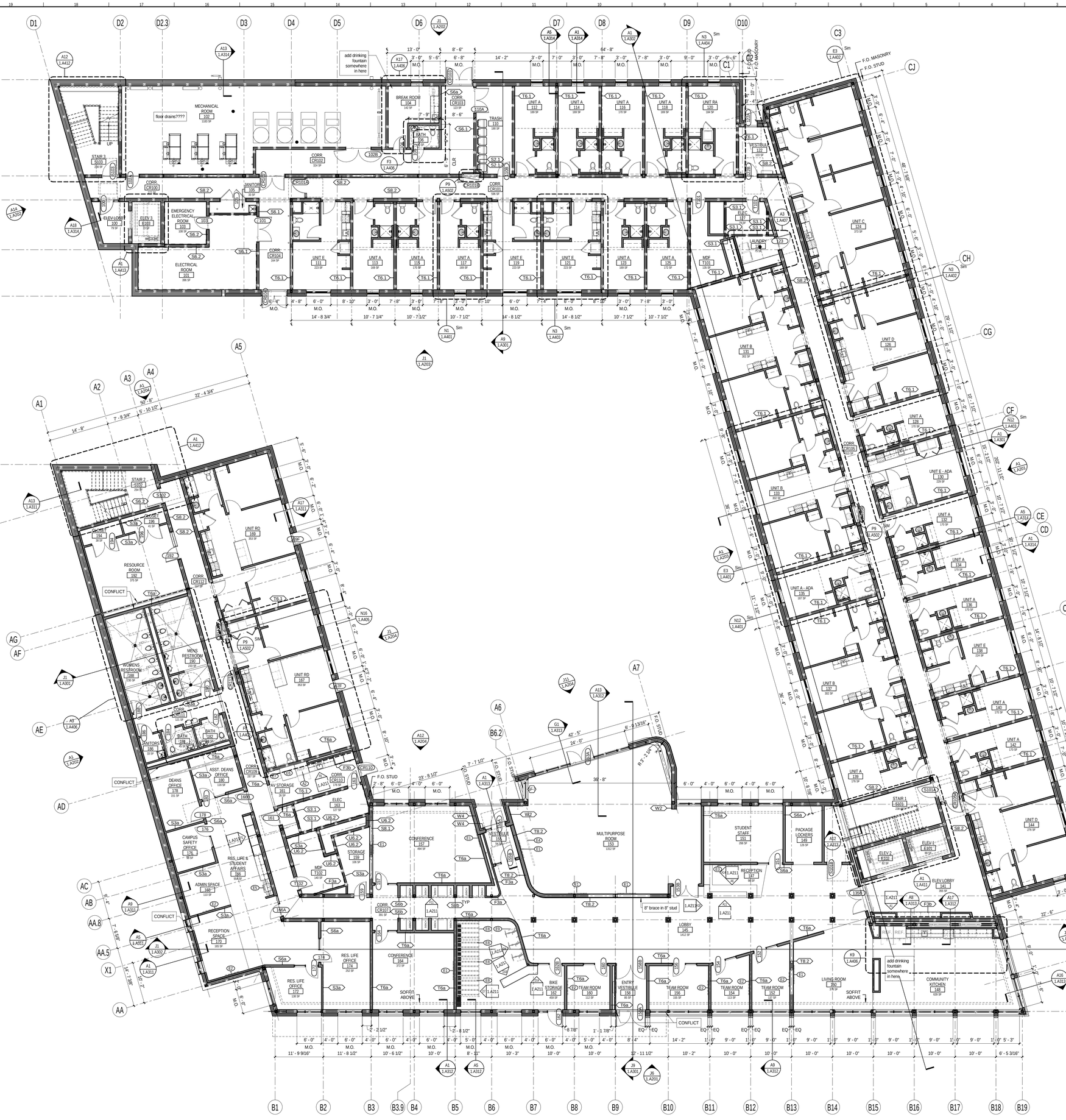
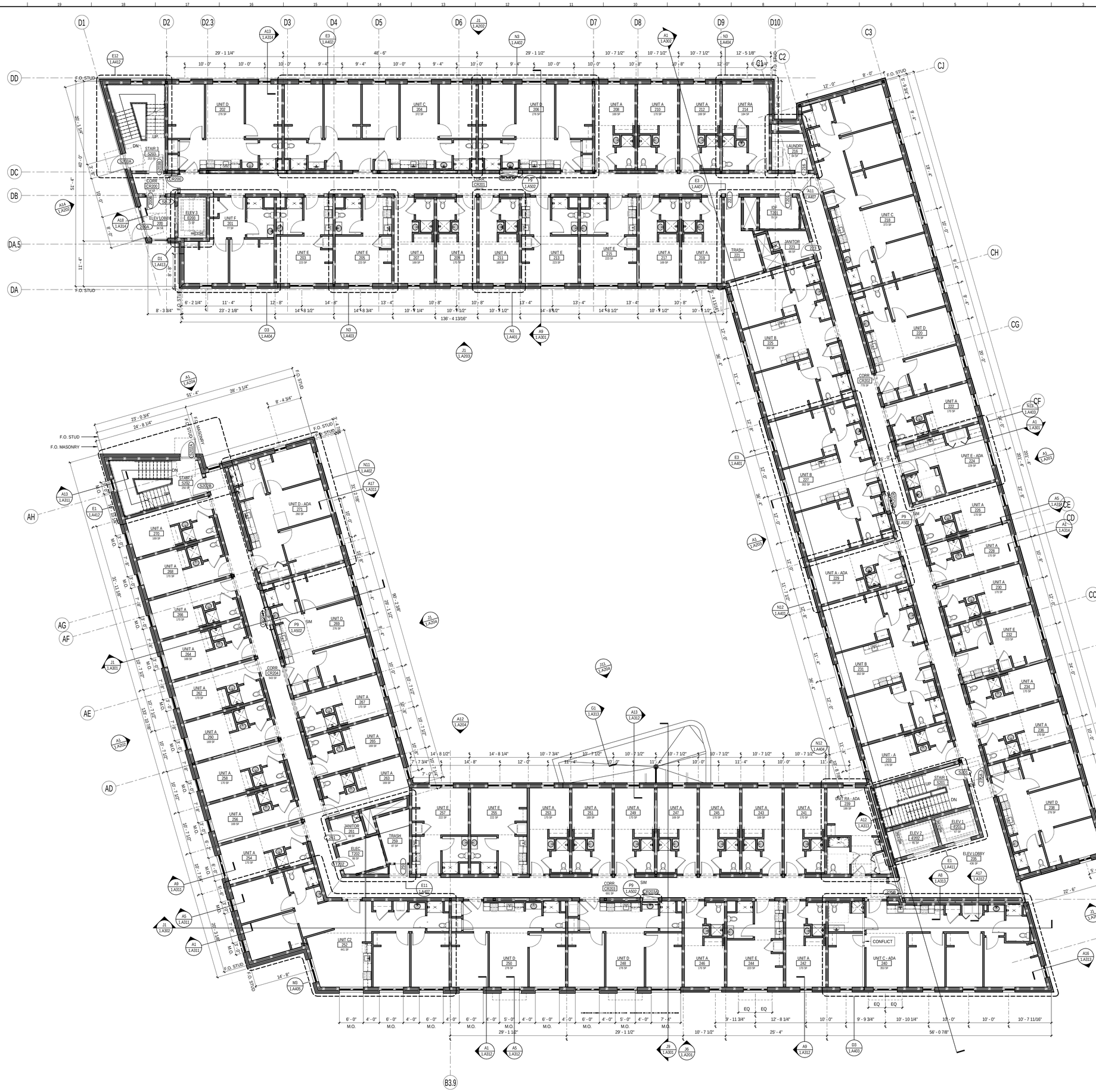

add drinking fountain somewhere in here
floor drains????
MECHANICAL ROOM 102
BREAK ROOM 134
TRASH 110
VESTIBULE 122
CORR. CR100
CORR. CR101
CORR. CR102
CORR. CR103
CORR. CR104
EMERGENCY ELECTRICAL ROOM 103
ELECTRICAL ROOM 101
JANITOR 105
ELEV LOBBY 100
ELEV 3 E103
STAIR 3 S103
UNIT A 112
UNIT A 114
UNIT A 116
UNIT RA 120
UNIT A 118
UNIT E 111
UNIT A 113
UNIT A 115
UNIT A 117
UNIT E 119
UNIT E 121
UNIT A 123
UNIT A 125
ELEC 127
LAUNDRY 129
MDF T101
UNIT C 124
UNIT D 126
UNIT B 131
UNIT B 133
UNIT A 132
UNIT E - ADA 130
UNIT A 134
UNIT A - ADA 135
UNIT B 137
UNIT A 136
UNIT E 138
UNIT A 139
UNIT A 140
UNIT A 142
UNIT D 144
STAIR 1 S101
ELEV 1 E101
ELEV 2 E102
STAIR 2 S102
UNIT RD 169
UNIT RD 167
RESOURCE ROOM 192
CONFLICT
WOMENS RESTROOM 188
MENS RESTROOM 190
JANITORS 198
BATH 194
BATH 196
BATH 198
DEANS OFFICE 179
ASST. DEANS OFFICE 180
CAMPUS SAFETY OFFICE 176
RES. LIFE & STUDENT AFFAIRS 166
ADMIN SPACE 168
RECEPTION SPACE 170
RES. LIFE OFFICE 172
RES. LIFE OFFICE 174
AV STORAGE 161
ELEC 163
CONFERENCE 157
STORAGE 159
MDF T102
CONFERENCE 164
SOFFIT ABOVE
BIKE STORAGE 152
TEAM ROOM 160
ENTRY VESTIBULE 155
TEAM ROOM 156
TEAM ROOM 154
TEAM ROOM 152
MULTIPURPOSE ROOM 153
STUDENT STAFF 151
PACKAGE LOCKERS 149
RECEPTION 147
LOBBY 145
ELEV LOBBY 141
LIVING ROOM 150
COMMUNITY KITCHEN 148
UNIT D 146
UNIT A 148
UNIT A 150
UNIT A 152
UNIT A 154
UNIT A 156
UNIT A 158
UNIT A 160
UNIT A 162
UNIT A 164
UNIT A 166
UNIT A 168
UNIT A 170
UNIT A



PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
4. DIMENSIONS ARE FACE OF CONCRETE, FACE OF MASONRY AND CENTERLINE OF STUD, UNLESS NOTED OTHERWISE.
5. DOOR JAMBS (HINGE SIDE) SHALL BE 6" FROM CORNER IN STUD PARTITIONS AND 8" FROM CORNER IN MASONRY PARTITIONS UNLESS NOTED OTHERWISE.
6. REFER TO DETAILS FOR ADDITIONAL DIMENSIONING INFORMATION.
7. REFER TO ENLARGED PLANS FOR PARTITION TYPES AND DIMENSIONS IN AREAS WHICH ARE DETAILED AT A LARGER SCALE.
8. FURNITURE AND OWNER PROVIDED EQUIPMENT ARE INDICATED BY DASHED LINE TYPE.
9. CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF OWNER PROVIDED EQUIPMENT INCLUDING BUT NOT LIMITED TO DIMENSIONAL INFORMATION, AND MECHANICAL, ELECTRICAL AND PLUMBING REQUIREMENTS.

REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

PROJECT NORTH:

SMRT Architects and Engineers
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UNIVERSITY OF SOUTHERN MAINE
CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 2 - FLOOR PLAN

SHEET TITLE:

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
AIE OF RECORD:	PDC		
JOB CAPTAIN:	SDL		1.A102
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A102-19206	SHEET No.	

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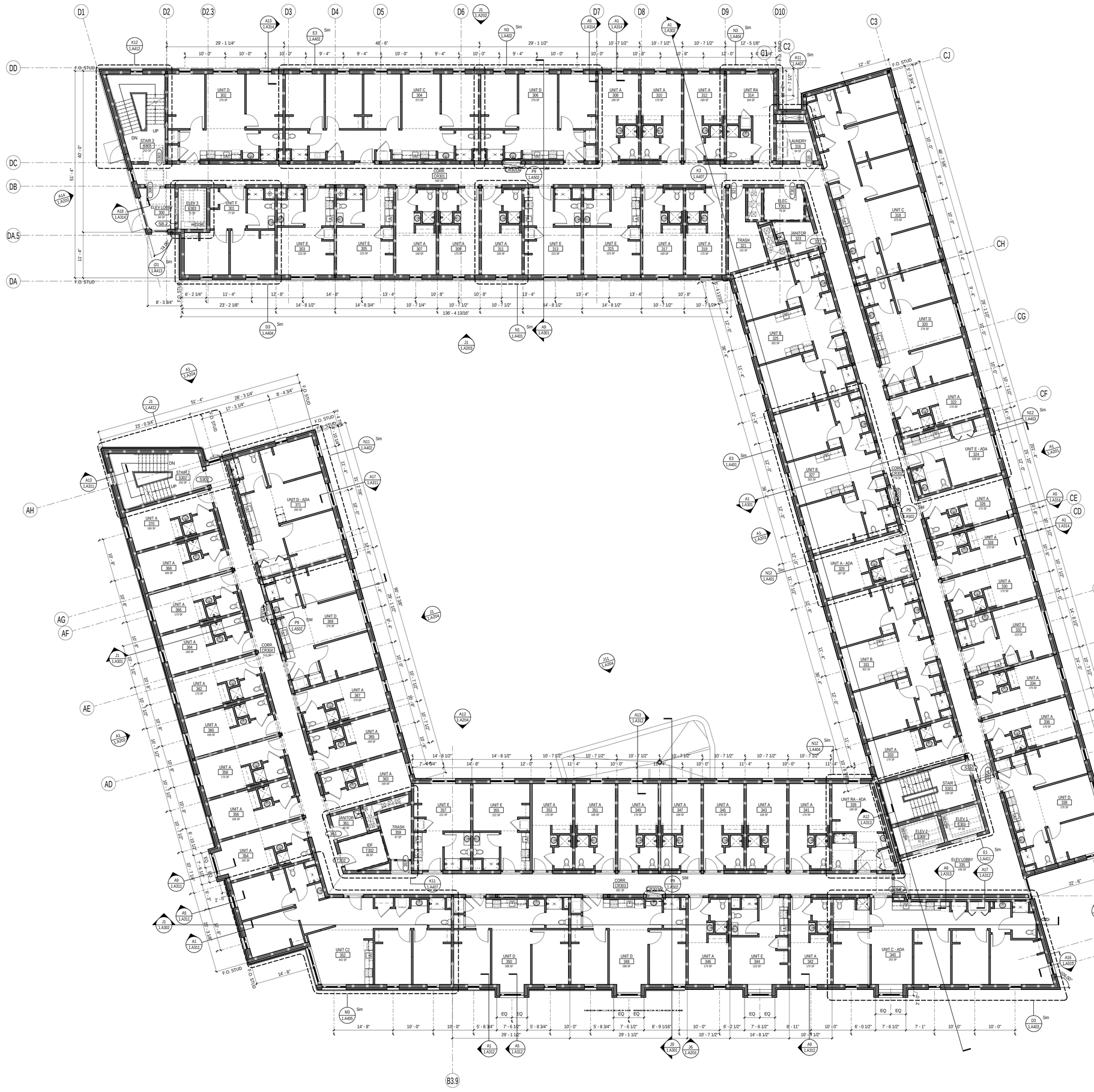

PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
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REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

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CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 3 - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	POC		
JOB CAPTAIN:	SDL		1.A103
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A103-19206	SHEET No.	

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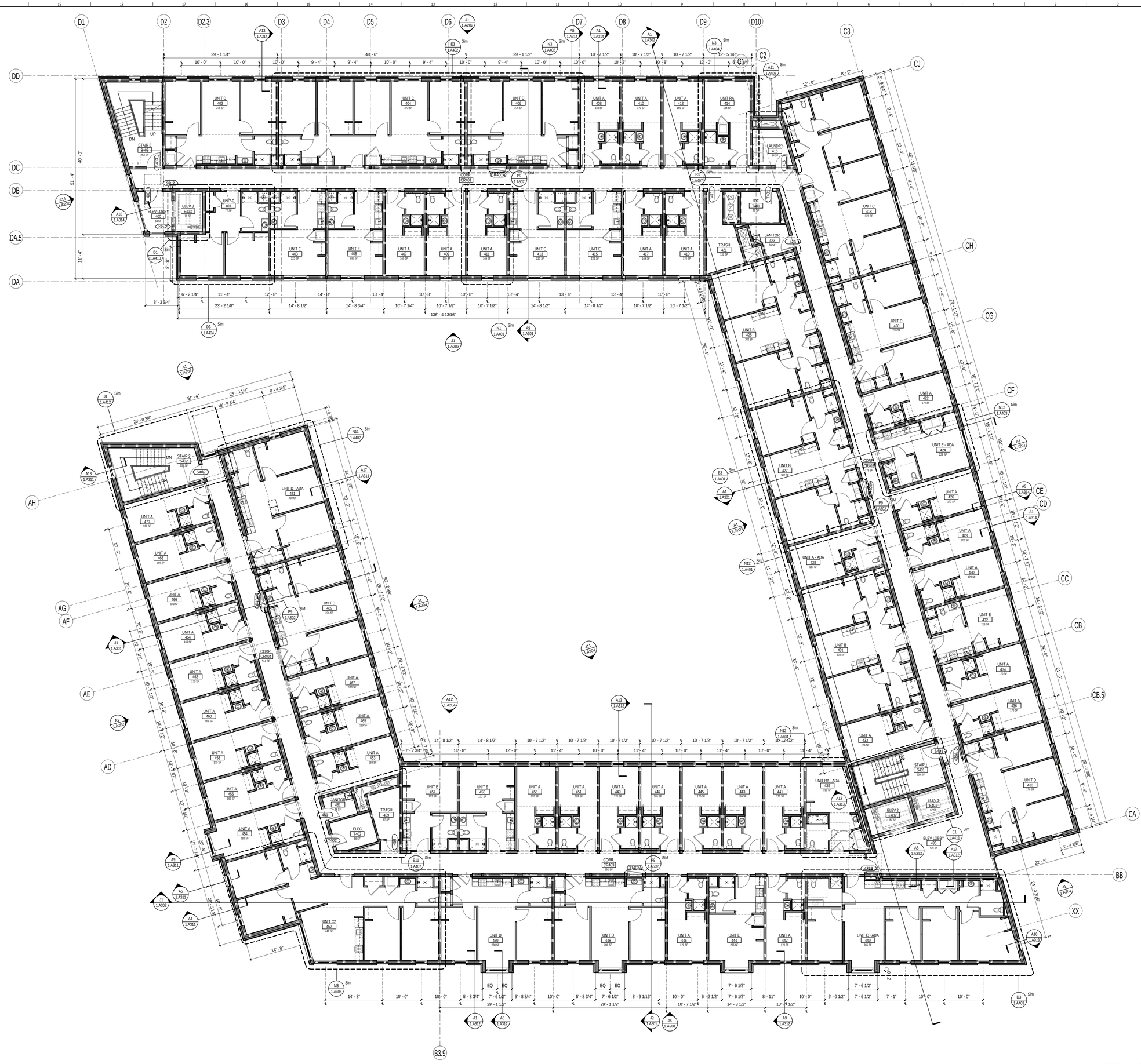
LEVEL 3 - FLOOR PLAN (A1)
1/8" = 1'-0"



PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
4. DIMENSIONS ARE FACE OF CONCRETE, FACE OF MASONRY AND CENTERLINE OF STUD, UNLESS NOTED OTHERWISE.
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9. CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF OWNER PROVIDED EQUIPMENT INCLUDING BUT NOT LIMITED TO DIMENSIONAL INFORMATION, AND MECHANICAL, ELECTRICAL AND PLUMBING REQUIREMENTS.

LEVEL 4 - FLOOR PLAN
1/8" = 1'-0" A1

REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

PROJECT NORTH:

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UNIVERSITY OF SOUTHERN MAINE
CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 4 - FLOOR PLAN

SHEET TITLE:

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	POC		
JOB CAPTAIN:	SDL		1.A104
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A104-19206	SHEET No.	

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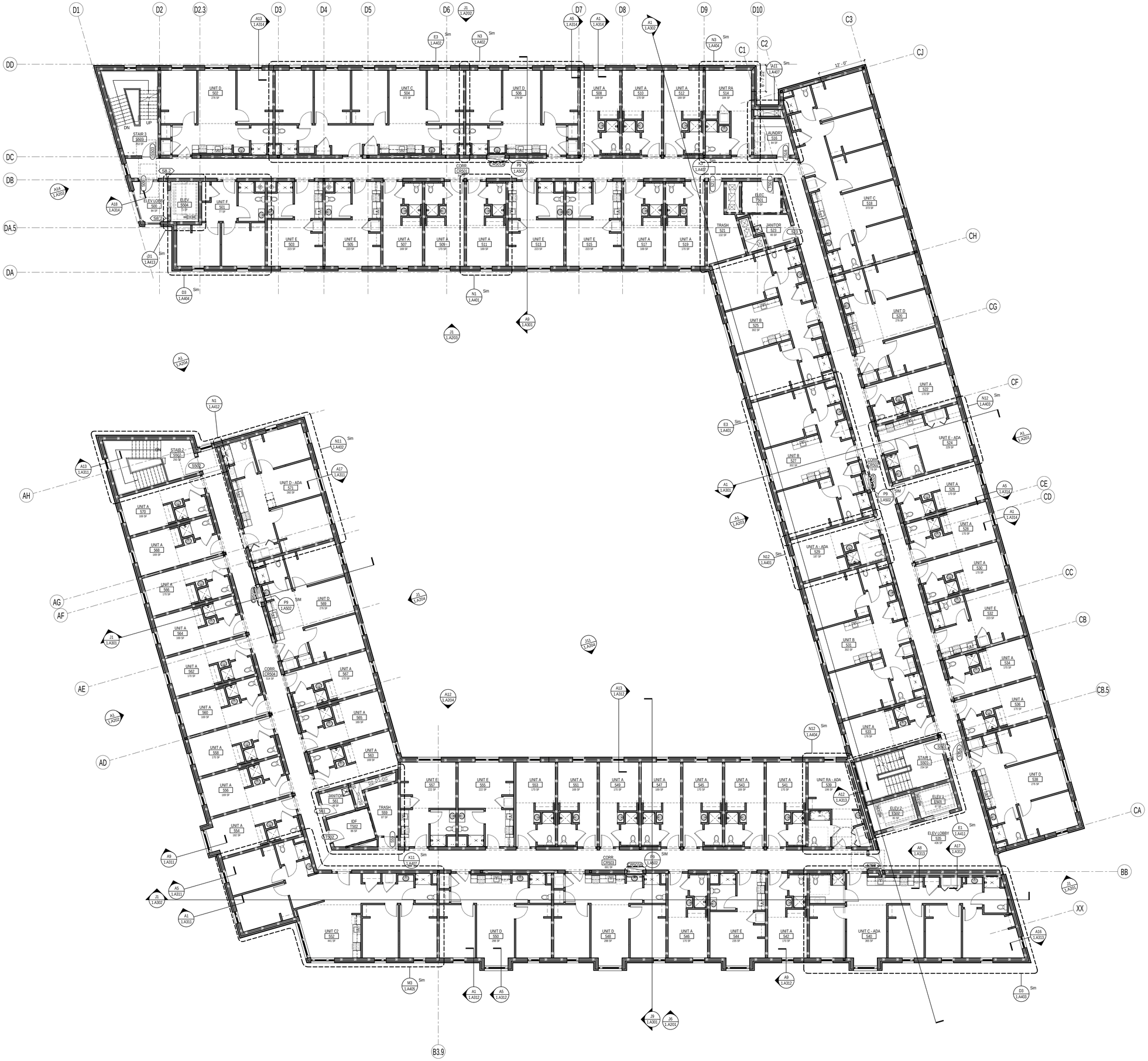

PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
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REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

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UNIVERSITY OF SOUTHERN MAINE
CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 5 - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	PDC		
JOB CAPTAIN:	SDL		
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A105-19206	SHEET No.	1.A105

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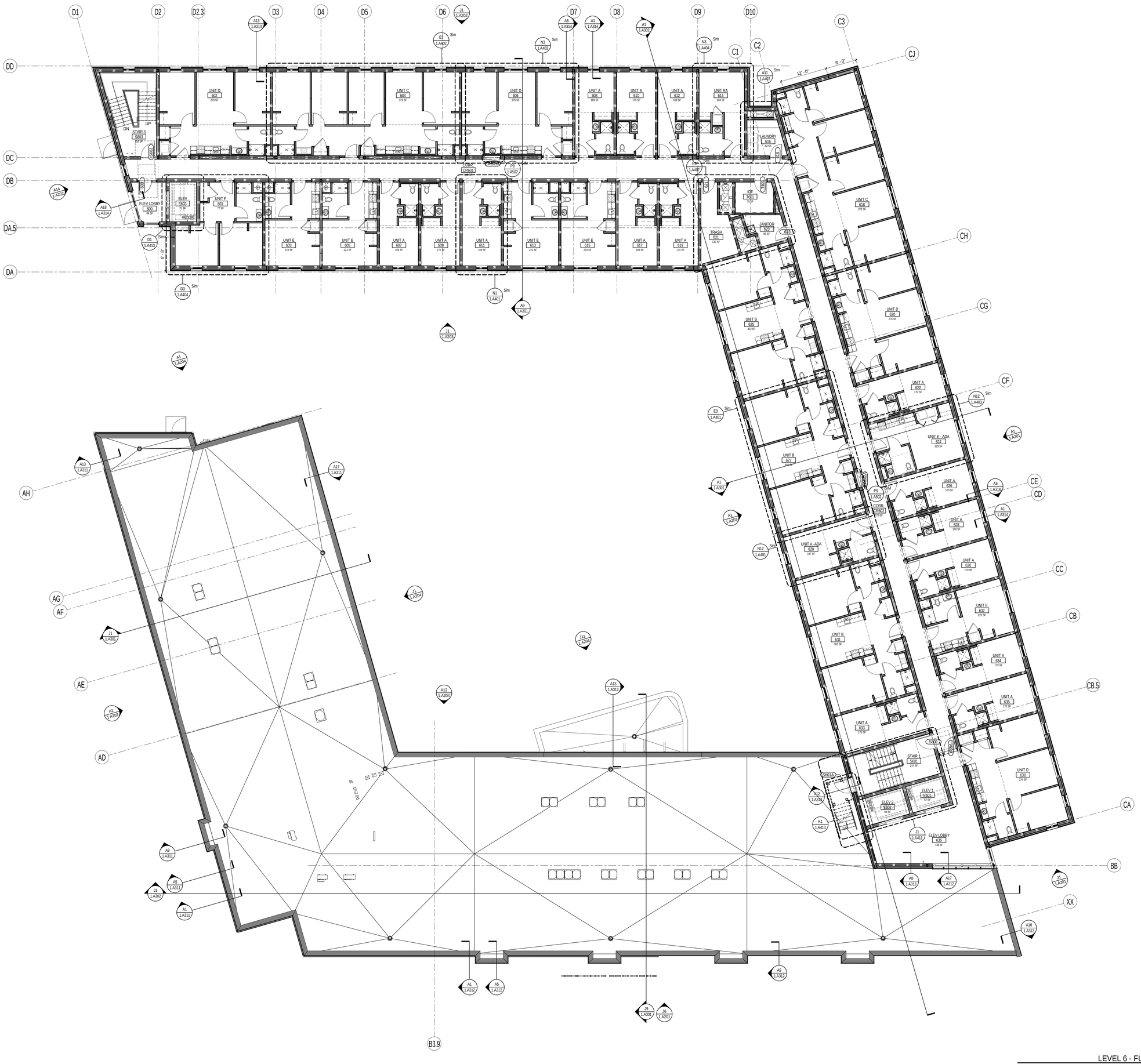
LEVEL 5 - FLOOR PLAN (A1)
1/8" = 1'-0"



PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
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LEVEL 6 - FLOOR PLAN
1/8" = 1'-0" A1

REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

PROJECT NORTH:

SMRT Architects and Engineers
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CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 6 - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	POC		
JOB CAPTAIN:	SDL		
DRAWN BY:	SDL/CAF		1.A106
SMRT FILE:	1.A106-19206	SHEET No.	

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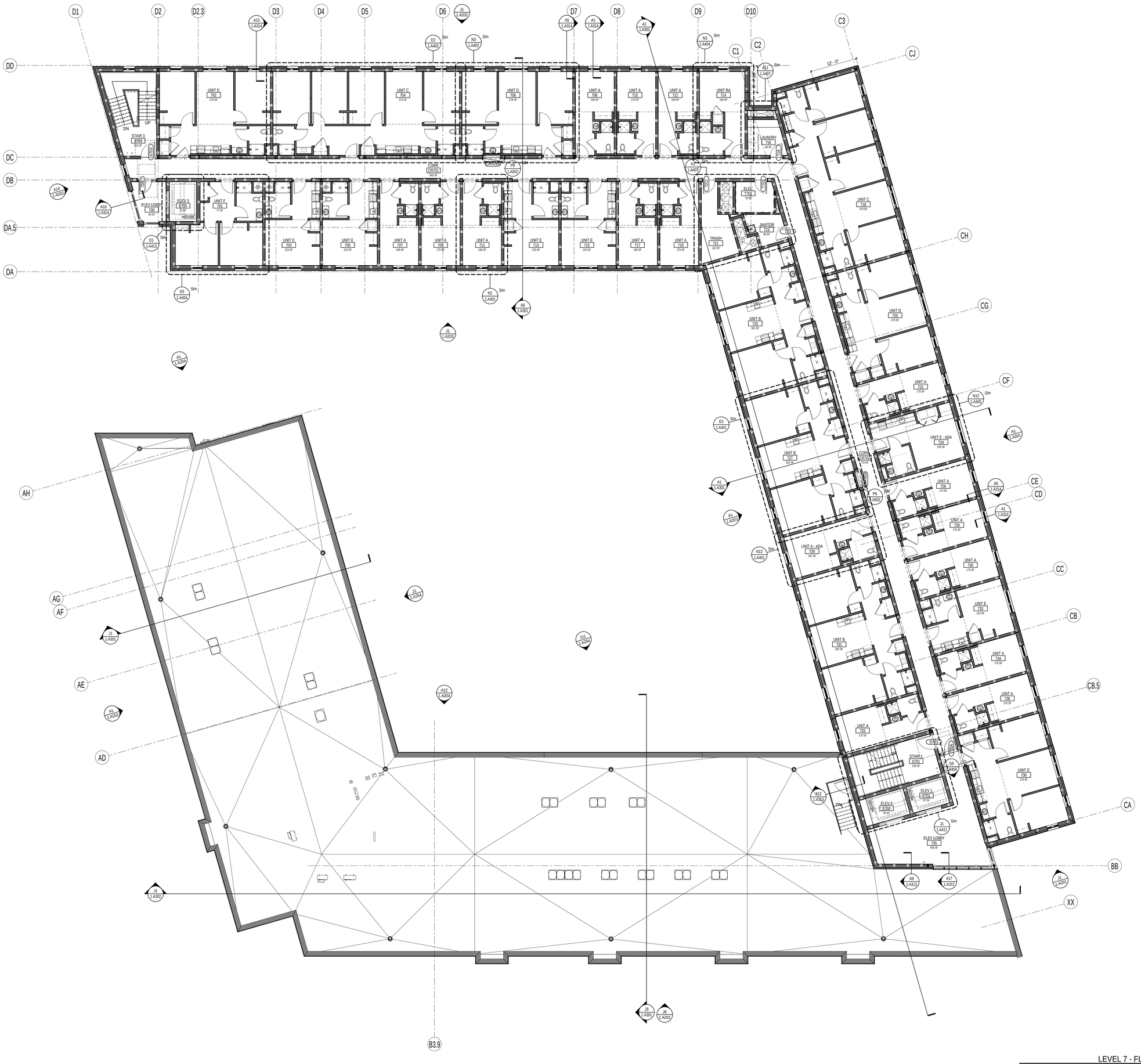

PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
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LEVEL 7 - FLOOR PLAN
1/8" = 1'-0" A1

REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

PROJECT NORTH:

SMRT Architects and Engineers
144 Fore Street
Portland, Maine 04101
1.877.700.7678
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UNIVERSITY OF SOUTHERN MAINE
CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 7 - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	POC		
JOB CAPTAIN:	SDL		
DRAWN BY:	SDL/CAF		1.A107
SMRT FILE:	1.A107-19206	SHEET No.	

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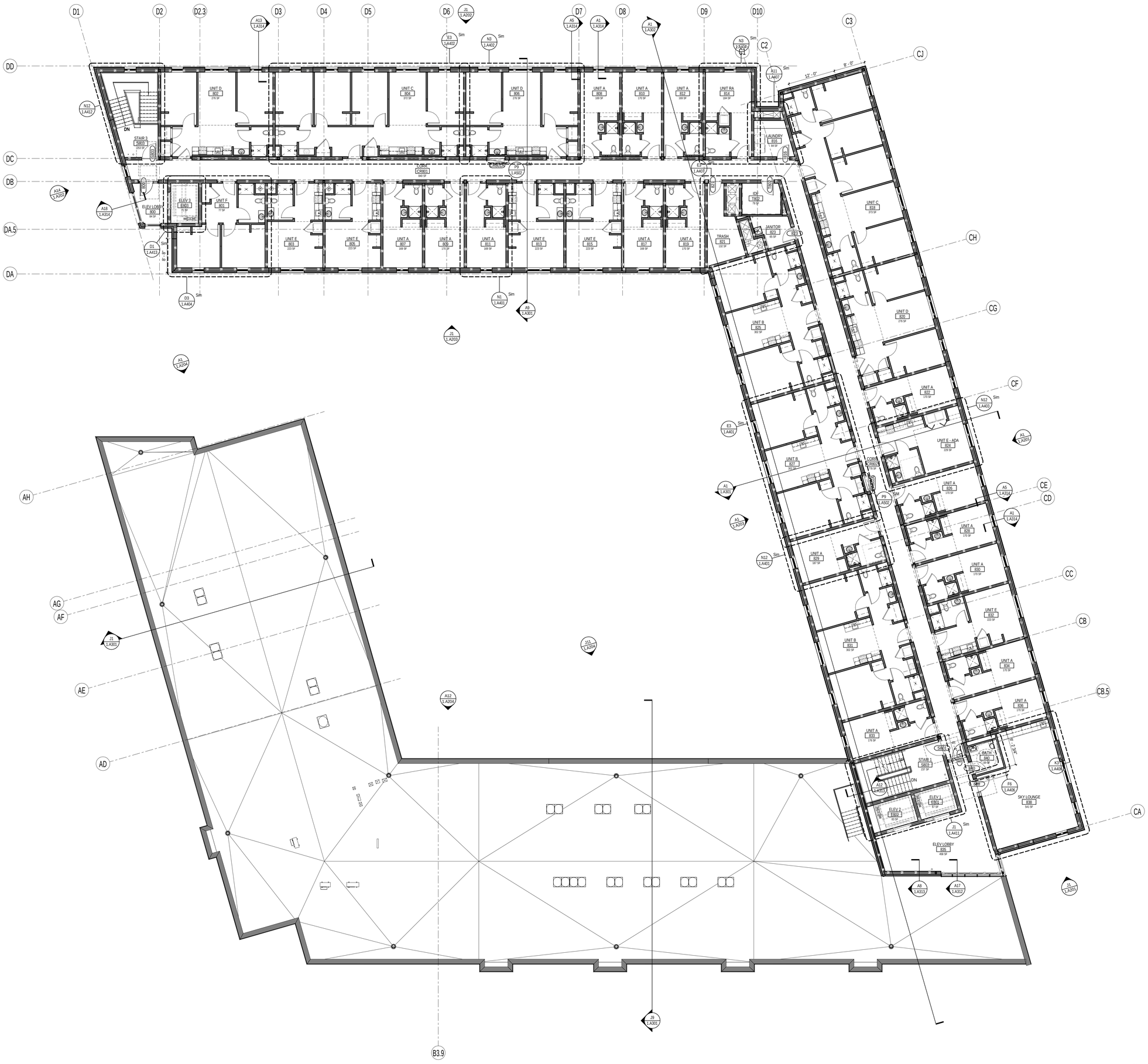

PLAN NOTES:

1. SEE 1.GI001 FOR GENERAL PROJECT NOTES, LEGENDS ABBREVIATIONS AND GENERAL MOUNTING HEIGHTS.
2. SEE 1.GI002 FOR TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
4. DIMENSIONS ARE FACE OF CONCRETE, FACE OF MASONRY AND CENTERLINE OF STUD, UNLESS NOTED OTHERWISE.
5. DOOR JAMBS (HINGE SIDE) SHALL BE 6" FROM CORNER IN STUD PARTITIONS AND 8" FROM CORNER IN MASONRY PARTITIONS UNLESS NOTED OTHERWISE.
6. REFER TO DETAILS FOR ADDITIONAL DIMENSIONING INFORMATION.
7. REFER TO ENLARGED PLANS FOR PARTITION TYPES AND DIMENSIONS IN AREAS WHICH ARE DETAILED AT A LARGER SCALE.
8. FURNITURE AND OWNER PROVIDED EQUIPMENT ARE INDICATED BY DASHED LINE TYPE.
9. CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF OWNER PROVIDED EQUIPMENT INCLUDING BUT NOT LIMITED TO DIMENSIONAL INFORMATION, AND MECHANICAL, ELECTRICAL AND PLUMBING REQUIREMENTS.

LEVEL 8 - FLOOR PLAN
1/8" = 1'-0" A1

REV	DESCRIPTION	DATE

DESIGN DEVELOPMENT
7-31-20

CURRENT ISSUE STATUS:

PROJECT NORTH:

SMRT Architects and Engineers
144 Fore Street
Portland, Maine 04101
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UNIVERSITY OF SOUTHERN MAINE
CAREER & STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

LEVEL 8 - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	KD	PROJECT NO:	19206
A/E OF RECORD:	POC		
JOB CAPTAIN:	SDL		
DRAWN BY:	SDL/CAF		
SMRT FILE:	1.A108-19206	SHEET No.	1.A108

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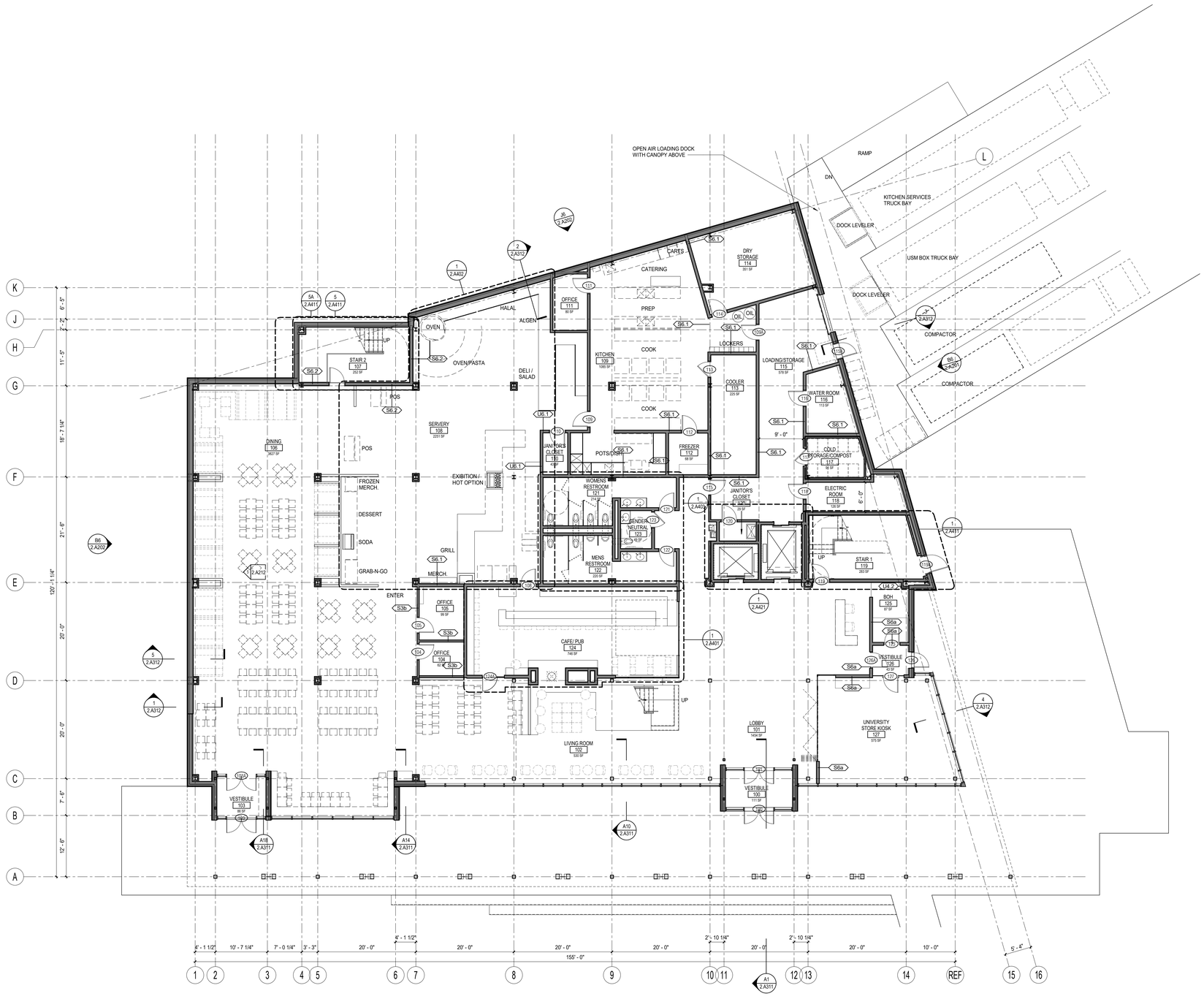

LEVEL 1 FLOOR PLAN (1)
1/8" = 1'-0"

PLAN NOTES:

1. SEE G-001 FOR GENERAL PROJECT NOTES, LEGENDS AND ABBREVIATIONS.
2. SEE G-002 FOR GENERAL MOUNTING HEIGHTS, TOP OF WALL DETAILS AND PARTITION TYPES.
3. CONTRACTOR IS RESPONSIBLE FOR REVIEWING CODE COMPLIANCE PLANS AND NOTIFYING THE ARCHITECT OF CONFLICTS BETWEEN WHAT IS IN THE FIELD AND ON THE CODE DOCUMENTS.
4. DIMENSIONS ARE FACE OF CONCRETE, FACE OF MASONRY AND CENTERLINE OF STUD, UNLESS NOTED OTHERWISE.
5. DOOR JAMBS (HINGE SIDE) SHALL BE 4" FROM CORNER IN STUD PARTITIONS AND 8" FROM CORNER IN MASONRY PARTITIONS UNLESS NOTED OTHERWISE.
6. REFER TO DETAILS FOR ADDITIONAL DIMENSIONING INFORMATION.
7. REFER TO ENLARGED PLANS FOR PARTITION TYPES AND DIMENSIONS IN AREAS WHICH ARE DETAILED AT A LARGER SCALE.
8. FURNITURE AND OWNER PROVIDED EQUIPMENT ARE INDICATED BY DASHED LINE TYPE.
9. CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF OWNER PROVIDED EQUIPMENT INCLUDING BUT NOT LIMITED TO DIMENSIONAL INFORMATION, AND MECHANICAL, ELECTRICAL AND PLUMBING REQUIREMENTS.

KEYNOTE

REV	DESCRIPTION	DATE
	PROGRESS	07-26-20

CURRENT ISSUE STATUS:

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PROJECT LOCATION

LEVEL ONE - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	XXX	PROJECT NO:	00000
A/E OF RECORD:	Checker		
JOB CAPTAIN:	XXX		
DRAWN BY:	Author		
SMRT FILE:	2.A101-00000	SHEET No.	2.A101

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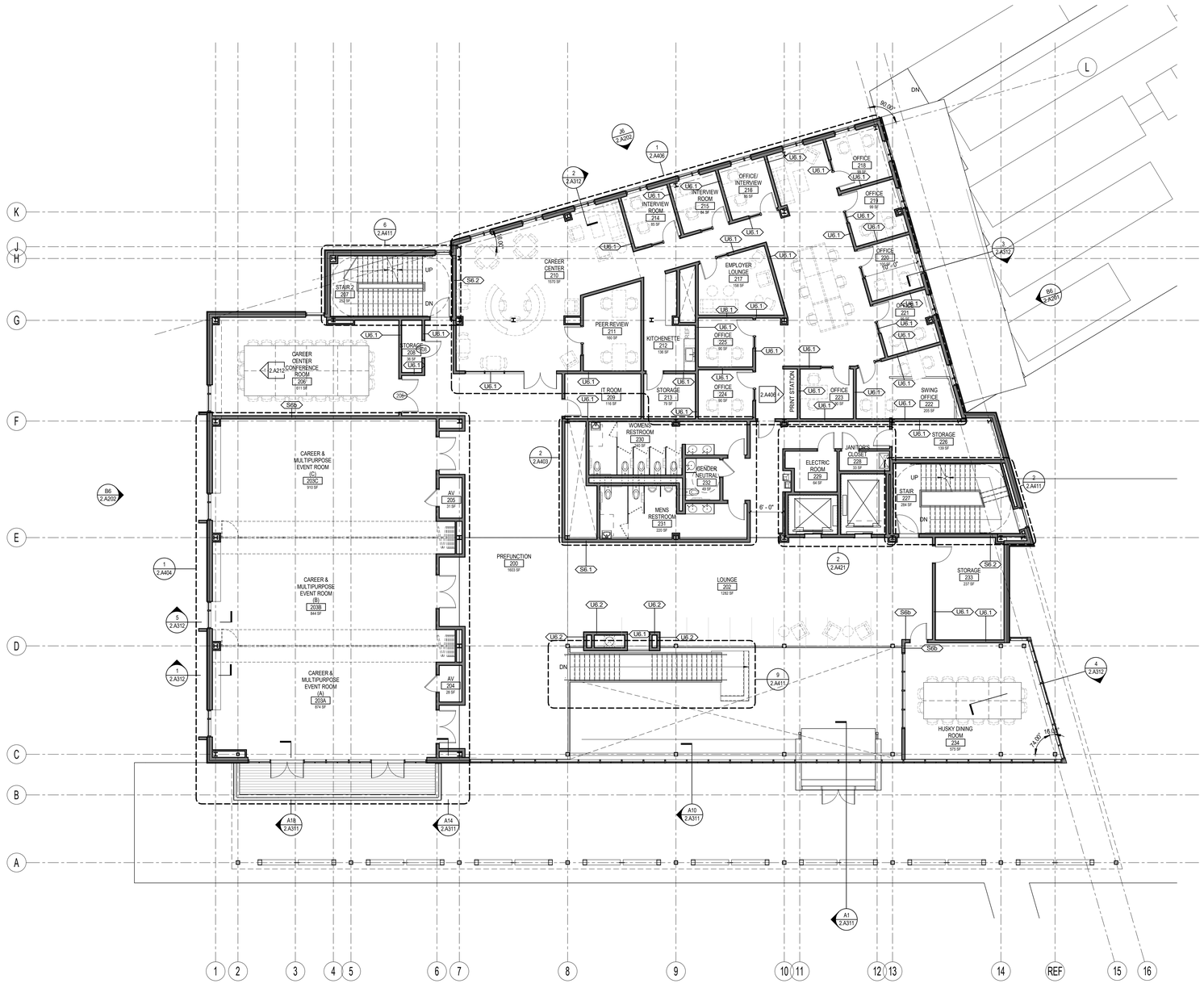

LEVEL 2 - FLOOR PLAN
1/8" = 1'-0"

REV	DESCRIPTION	DATE

PROGRESS
07-26-20
CURRENT ISSUE STATUS:

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PROJECT LOCATION

LEVEL TWO - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

PROJECT MANAGER:	XXX	PROJECT NO:	00000
A/E OF RECORD:	Checker		
JOB CAPTAIN:	XXX		2.A102
DRAWN BY:	Author		
SMRT FILE:	2.A102-00000	SHEET No.	

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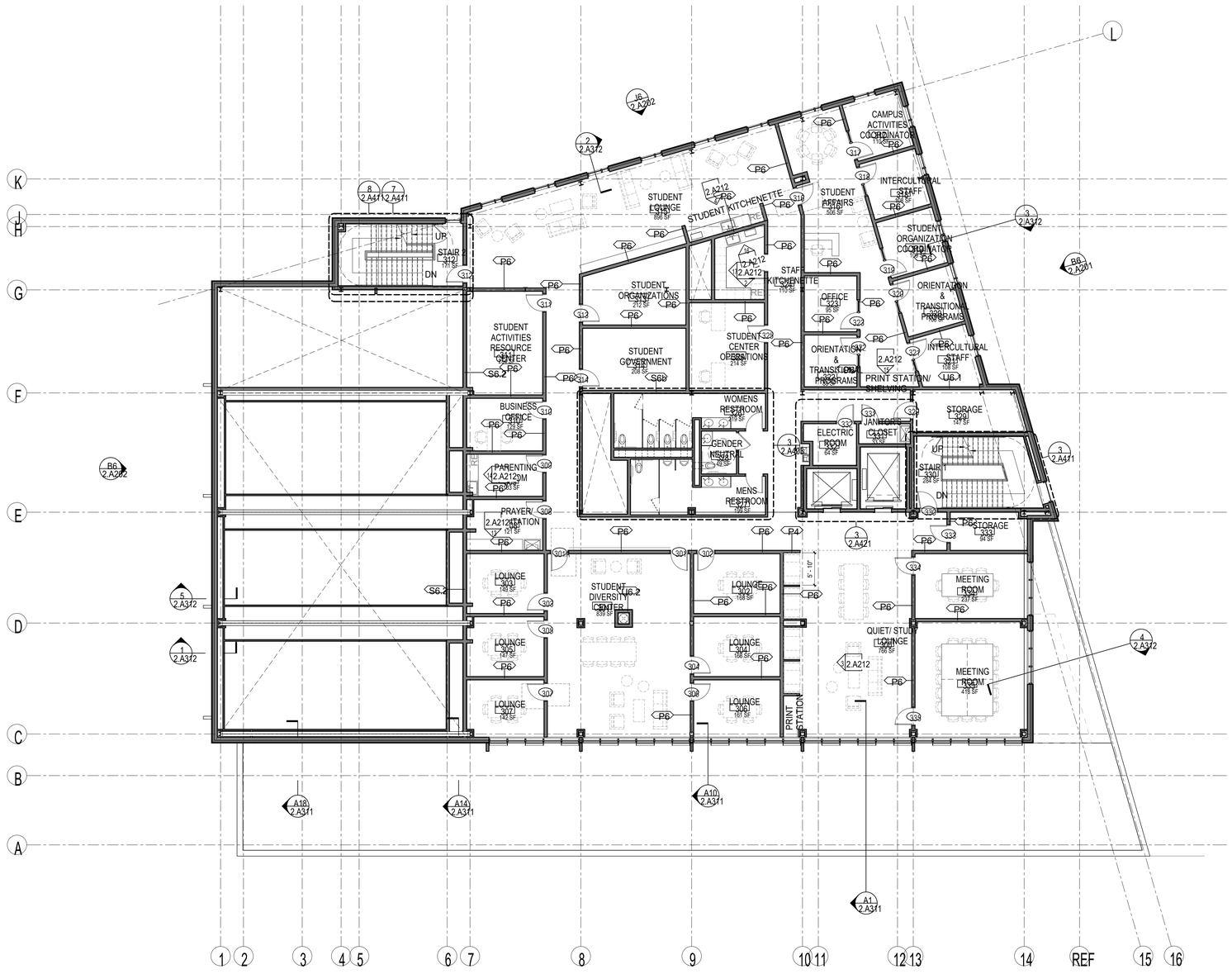

AFL03 - FLOOR PLAN

1/8" = 1'-0"

REV	DESCRIPTION	DATE

PROGRESS
07-26-20

CURRENT ISSUE STATUS:

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PROJECT LOCATION

LEVEL THREE - FLOOR PLAN

SHEET TITLE:

SCALE: AS NOTED

PROJECT MANAGER:	XXX
A/E OF RECORD:	Checker
JOB CAPTAIN:	XXX
DRAWN BY:	Author
SMRT FILE:	2.A103-00000
PROJECT NO:	00000

2.A103

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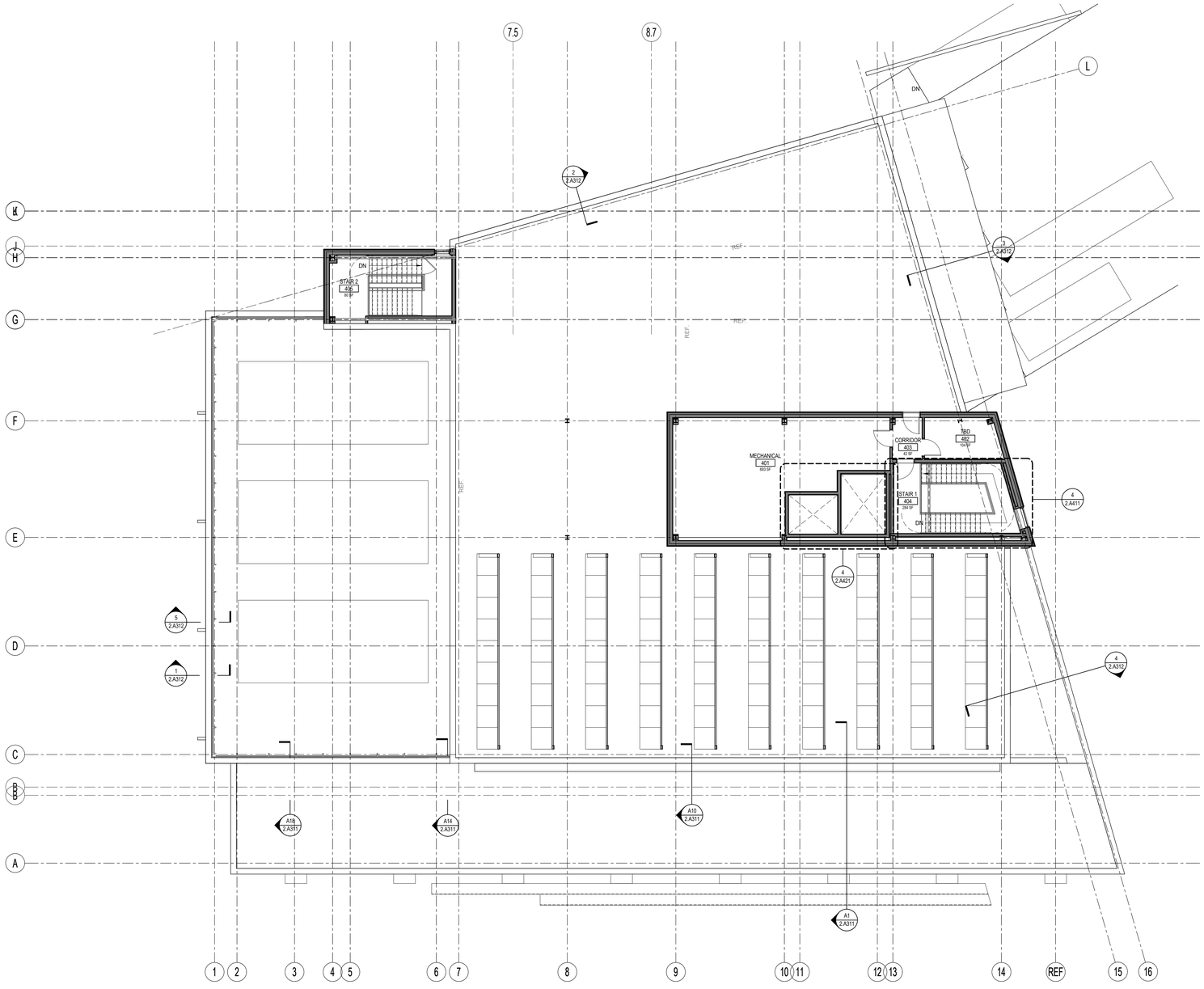

AFL04 - PENTHOUSE PLAN 1

1/8" = 1'-0"

REV	DESCRIPTION	DATE

PROGRESS
07-26-20

CURRENT ISSUE STATUS:

PROJECT NORTH:

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CAREER AND STUDENT SUCCESS CENTER & PORTLAND COMMONS

PROJECT LOCATION

PENTHOUSE - FLOOR PLAN

SHEET TITLE:

0" 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	XXX	PROJECT NO:	00000
A/E OF RECORD:	Checker		
JOB CAPTAIN:	XXX		
DRAWN BY:	Author		
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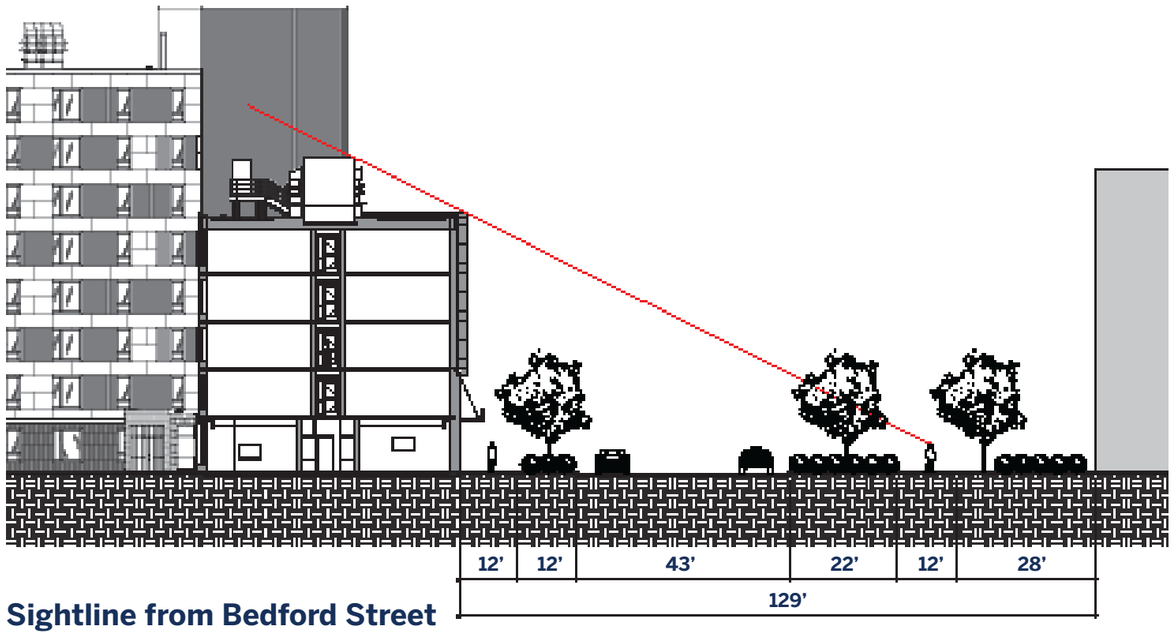
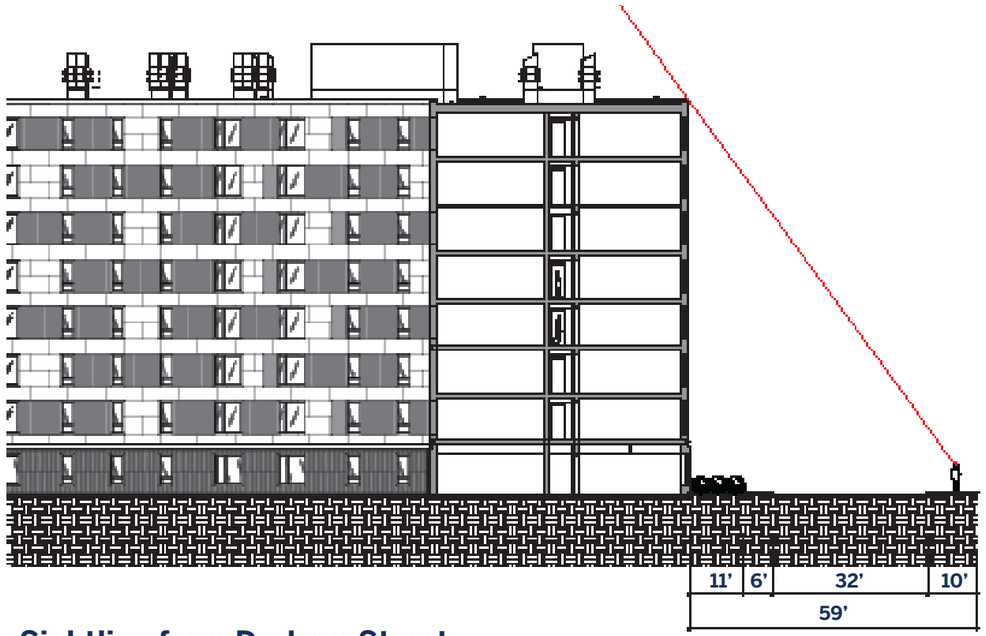
Sightline Diagram



Sightline from Bedford Street



Sightline from Durham Street

Rendering

Site Plan



Rendering

Site Plan



Existing



Proposed

Rendering

Aerial



Rendering

Aerial



Existing



Proposed

Career & Student Success Center Residence Hall

Overall Bird's Eye



Career & Student Success Center Residence Hall

Bedford Street View in Spring



Career & Student Success Center Residence Hall

Bedford Street View in Winter



Career & Student Success Center
Residence Hall
Entry View of Residence Community



Career & Student Success Center
Residence Hall
Long View of CSSC from Bedford Street Crosswalk



Rendering

Across Bedford St



Career & Student Success Center
Residence Hall
Career & Student Success Center South Facade



Career & Student Success Center
Residence Hall
Career and Student Success Center Portico



Rendering

Courtyard



Career & Student Success Center
Residence Hall
Residence Hall View Along Durham Street



Memorandum
Planning and Urban Development Department
Planning Division

To: Chair Mazer & Members of the Planning Board
From: Andrew Tufts, Planner
Date: October 9, 2020
Re: 7 Rand Road Rezoning
Project ID: ZN-001041-2020 **CBL:** 262 A001
Meeting Date: October 13, 2020



The surrounding context of 7 Rand Road, highlighted in orange

I. INTRODUCTION

Brockway-Smith Company seeks a zoning map amendment to rezone the parcel at 7 Rand Road from an I-M Industrial/B-2 Community Business split lot condition to fully I-M, removing the split lot condition via an adjustment to the zoning boundary & existing property lines so that the property can be brought into greater conformity and allow for more cohesive future expansion of the currently bifurcated site. The subject property is located between Interstate 95 and Rand Road and is 18.4 acres in size. The site is currently developed with a 300,000 SF warehouse, a paved truck staging area, and surface parking.

- Owner/Applicant: Brockway-Smith Company
- Applicant Representatives: Mary Costigan (Applicant), Bernstein Shur; Charlie Smith, Owner

II. PROPOSED MAP AMENDMENT

Current Zoning: I-M Industrial & B-2 Community Business
Proposed Zoning: I-M Industrial
Current Use(s) at Site: Warehouse
Future Contemplated Use(s) at Site: Warehouse expansion
Total Parcel Area: 18.376 acres

The current I-M zoning allows for light and moderate impact industrial and transportation-related uses to coexist. The proposed rezoning is intended to facilitate future warehouse expansion that the current B-2 zoning does not allow, as the existing useis legally non-conforming.

III. BACKGROUND



Use Context
The 7 Rand Road site includes one parcel and is currently occupied by a 300,000 SF warehouse and associated surface parking & staging area. The property is currently under contract, having been sold to Brockway-Smith Company on March 31, 2020, for approximately $12,800,000. The sale involved the formation of two lots which are now under separate ownership. Following the lot divide, the warehouse lot is approximately 14.68 acres, and the remaining B-2 parcel is approximately 3.69 acres.

Outer Brighton Avenue in the vicinity of the subject property is a major arterial road, ranging from 50 to 100 feet in width, with four to six travel lanes. Rand Road, connecting Brighton Ave to the Westbrook Arterial, is approximately 50 feet in width, with two travel lanes and a center turn lane. Uses fronting along this segment of Rand Road include a mix of auto dealerships, commercial retail, and a variety of industrial uses. To the east lies a low to medium density residential neighborhood within an R-3 zone, with single family homes. The I-95 interchange lies approximately half a mile south-west, at the Westbrook Arterial Toll Plaza. The western half of the parcel is undeveloped and abuts I-95. Further to the west, across the interstate lies the former site of Pike Industries, which is now being redeveloped as Rock Row, a new mixed-use commercial and residential development. The north edge of the parcel abuts Lowes Home Improvement, a building of comparable size and hundreds of surface parking spaces. The Mountain West Division Rail Corridor runs along the parcel's southern boundary.



Rand Road with subject property on right side of frame

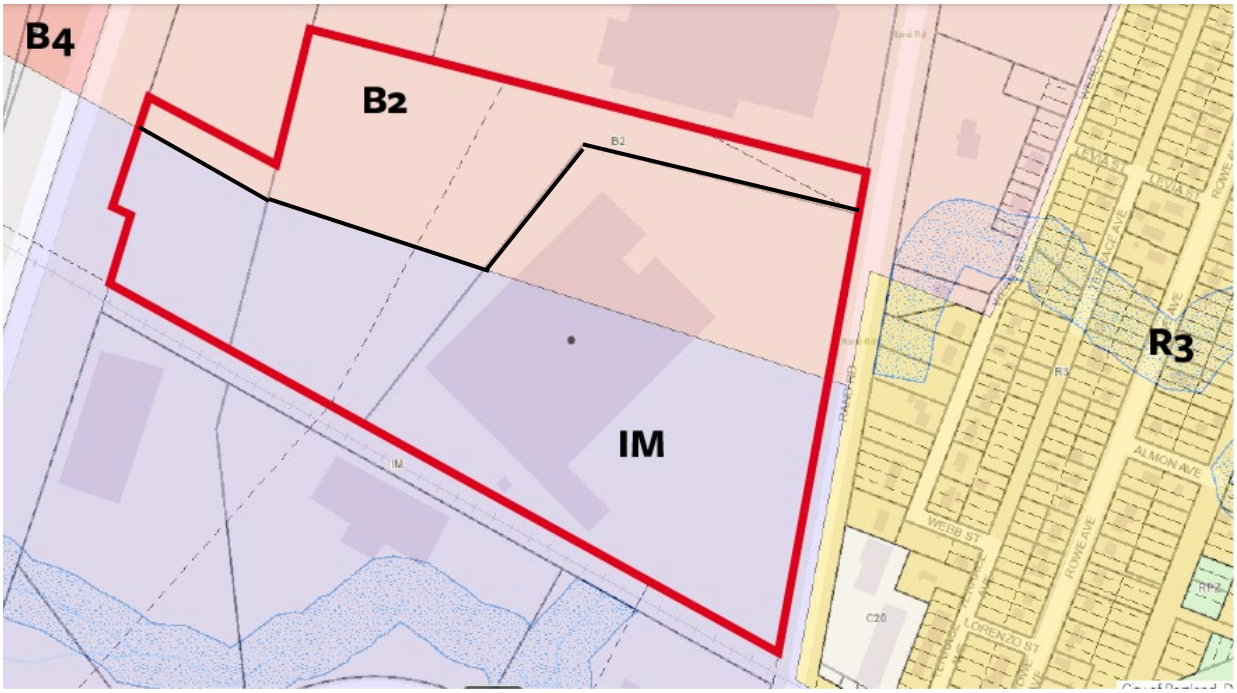


View of subject property from Rand Road



Birds Eye Perspective

Zoning Context



Existing Zone Map & Parcel Boundary

The subject property straddles the boundary of the B-2 and I-M zones. The northern portion of the site is zoned B-2, which extends northward to Brighton Avenue. The southern portion of the site is zoned I-M, which extends southward between Rand Road and I-95 to the Westbrook Arterial. The area directly across Rand Road, to the east, is zoned R-3, which is the predominant residential zone of outer Brighton Avenue. To the south and east lies a Resource Protection (RP) zone which encompasses the Fore River Sanctuary. A

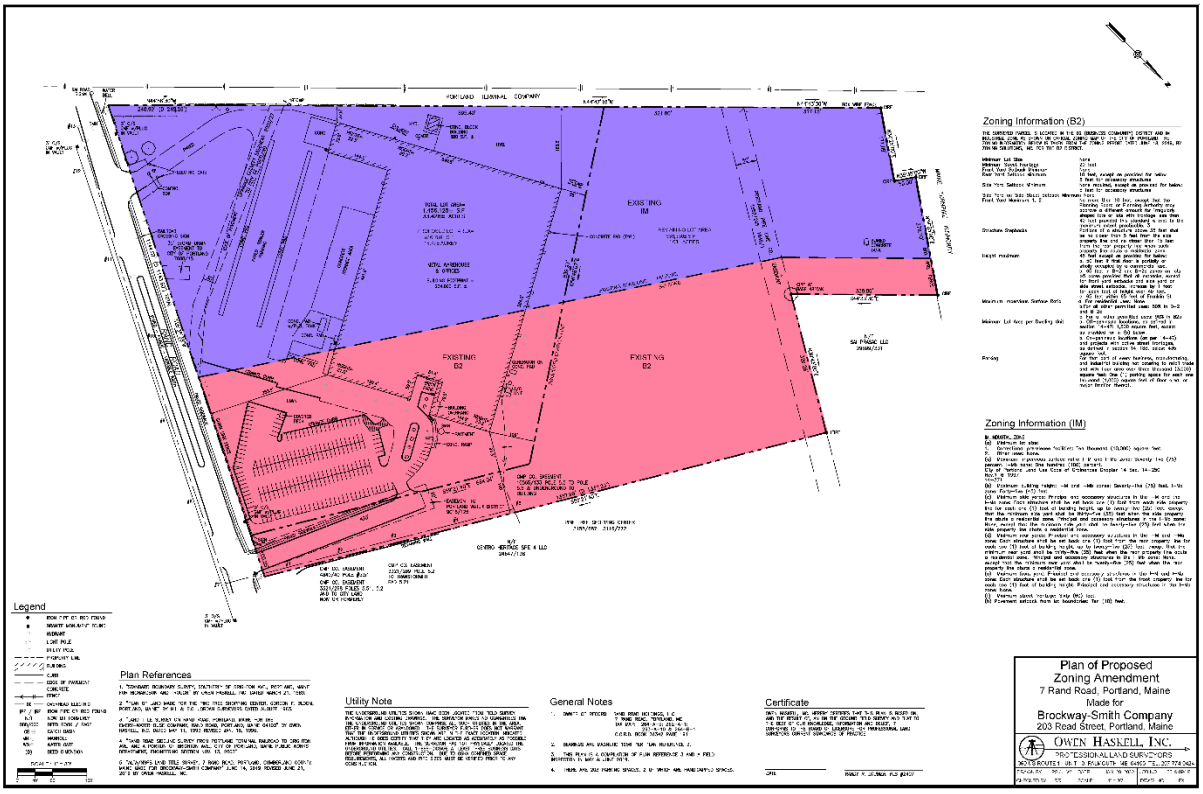
Shoreland Overlay Zone abuts the site to the south and east due to a tributary of the Fore River. A portion of this tributary crosses the southeast corner of the site, but is buried below grade.

IV. CONCEPTUAL FUTURE DEVELOPMENT

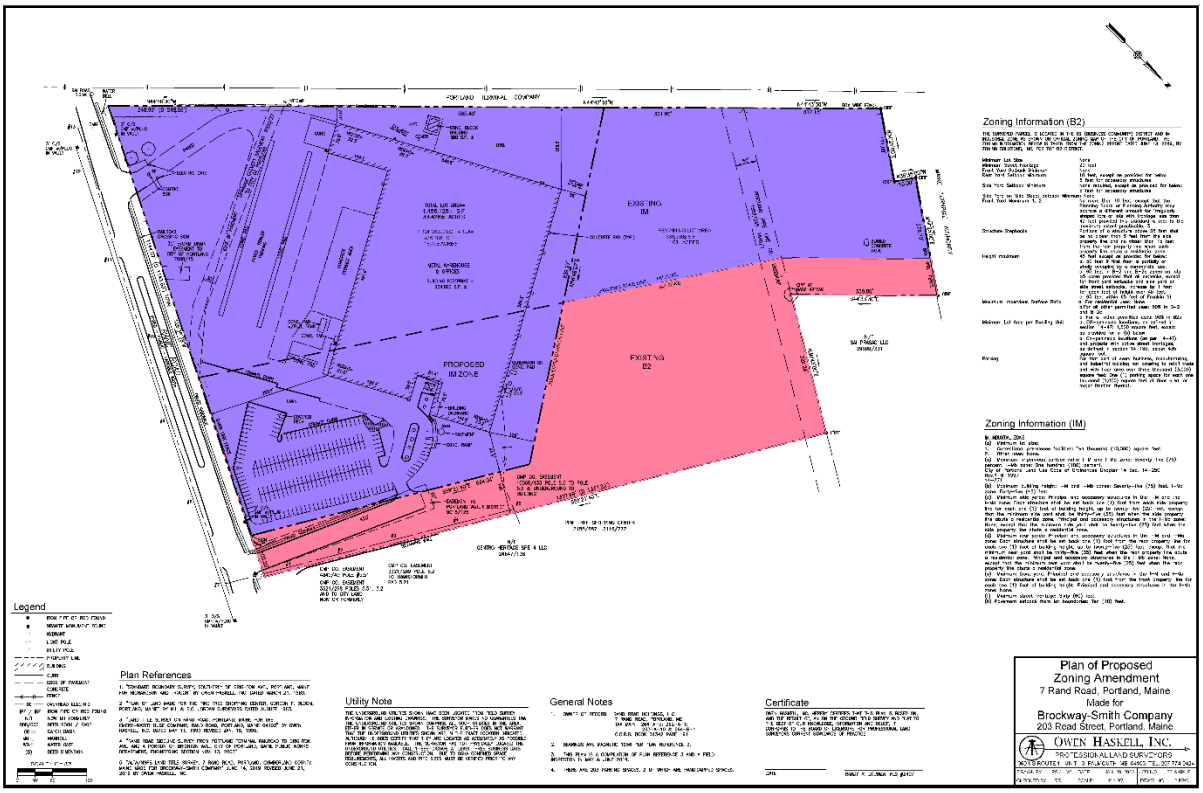
While a development proposal was not included within the application package for this zoning map amendment, the applicant seeks a rezoning at the subject property to facilitate the future expansion of the existing warehouse facility which is allowed in the I-M zone. Further expansion within the B-2 portion of the site is not permitted due to the industrial use having legally nonconforming status.

V. ZONING ANALYSIS

The existing warehouse use is not permitted in the B-2 zone. In order to facilitate that use, and to allow future development potential at the subject property under the existing I-M use categories, the applicant has sought this map amendment. The I-M zone allows a broad range of commercial and industrial uses. Permitted uses in the I-M include but are not limited to construction services, wholesale trade, warehousing, intermodal transportation facilities, repair services, plant nurseries, food processing, and solid waste facilities. In addition to Rand Road, I-M is generally mapped directly off of major corridors such as Warren Avenue, Riverside Street, Presumpscot Street, and East Bayside.



Existing Zoning – Source: Owen Haskel, INC



Proposed Zoning – Source: Owen Haskel, INC

The B-2 zone is intended to encourage a greater variety of commercial uses and at a higher intensity than the I-M zone. The B-2 zone is also intended to increase housing opportunities via the higher density allowance and to encourage mixed-use activities. Table 1 compares the purpose statements of the two zones as written in the ordinance.

Table 1: Purposes

	I-M Industrial	B-2 Community Business
Purpose	The moderate impact industrial zones are intended to provide zones in areas of the city in which light and moderate impact industries and transportation-related uses will coexist. The moderate impact industrial (I-M and I-Ma) zones are located on arterials or collectors. The I-Mb zones are similarly located on the peninsula. These locations provide for direct access onto arterials, thereby protecting residential neighborhoods from drive-through traffic. The I-M, I-Ma and I-Mb industrial zones are intended to provide for larger industrial buildings and for the limited or controlled use of areas	The purpose of the B-2 community business zone is: **1**. To provide appropriate locations for the development and operation of community centers offering a mixture of commercial uses, housing and services serving the adjoining neighborhoods and the larger community. **2.** The variety, sites and intensity of the permitted commercial uses in the B-2 zone are intended to be greater than those permitted in the B-1 neighborhood business zone. **3.** The B-2 zone will provide a broad range of goods and services and general businesses with a mixture of large and small buildings such as grocery stores, shops and services located in

	outside of structures for storage of materials and machinery. These facilities often require large volumes of imported materials and products which result in large volumes of shipping and receiving. Often uses may be highway-oriented and transportation-related, thus relying on citywide and regional transportation infrastructure. Industrial uses in the moderate impact industrial zones may require separation from higher impact uses, which should be directed to the high impact industrial zone.	major shopping centers and along arterial streets. Such establishments should be readily accessible by automobile, by pedestrians and by bicycle. Development in the B-2 zone should relate to the surrounding neighborhoods by design, orientation, and circulation patterns. **4.** The B-2 and B-2b will provide locations for moderate to high density housing in urban neighborhoods along arterials.

Permitted Uses

The change from B-2 to I-M would allow the expansion of the existing warehouse use (along with other uses) at the subject property. The I-M zone allows a different range of uses than the B-2, including warehouses vs residential. Permitted and conditional uses in both the I-M and B-2 zones are outlined in the tables below:

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			I-M	B-2
Permitted	Residential	Single-family and two-family dwellings		*x*
		Multi-family dwellings		*x* [2]
		Handicapped family units		*x*
		Single-family manufactured housing		
		Combined living/working spaces		*x*
		Lodging houses		*x*
	Institutional	Schools		*x*
		Clinics	*x*	*x*
		Places of assembly	*x*	*x*
		Long term, extended and intermediate care facilities		*x*
		Governmental buildings and uses/municipal uses	*x*	*x*
		College, university or trade schools		*x*

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			I-M	B-2
		Nursery schools, kindergartens		
		Day care facilities	x	x
	Business	General, business & professional offices	x	x
		Personal services	x	x
		Offices of building tradesmen	x	x
		Retail establishments	x	x
		Restaurants		x
		Drinking establishments		x
		Billiard parlors		x
		Mortuaries or funeral homes		x
		Miscellaneous repair services, excluding motor vehicle repair	x	x
		Communication studios or broadcast and receiving facilities	x	x
		Health clubs and gymnasiums	x	x
		Veterinary hospitals	x	x
		Theaters	x	x
		Hotels		x
		Dairies and bakeries	x	x
		Drive-throughs when accessory to a principal use	x	x
		Registered medical marijuana dispensaries		x
		Accessory uses	x	x
		Cemeteries		
		Parks	x	

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			I-M	B-2
		Home occupation	x	
		Special needs independent living units		
		Conversion into bed and breakfast		
		Hostels		x
		Wind energy systems	x	x
		Utility substations	x	x
		Bed and breakfasts		x
		Studios for artists and craftspeople	x	x
Conditional	Residentia	Sheltered care group homes		
		Conversion into bed and breakfast (over 5 rooms)		
	Institutional	Schools		
		Long-term and extended care facilities	x	
		Intermediate care facility	x	
		Places of assembly	x	
		Hospital	x	
		College, university, trade schools	x	
	Business	Major and minor auto service stations existing as of 1999		x
		Car washes		x
		Drive-throughs associated with a permitted use adjacent to residential zones		x
		Automobile dealerships		x
	Other	Utility substations	x	
		Professional offices		

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			I-M	B-2
		Chancellery		
		Nursery school and kindergartens		
		Off-street parking for passenger cars for permitted uses		
		Day care facilities	x	
		Temporary wind anemometer towers	x	x
		Hostels		
		Wind energy systems	x	x
		Printing and publishing establishments	x	x
		Wholesale distribution establishments	x	x
		Research and developments and related production establishments	x	x

[1] Any residential use permitted in the residential zone abutting the lot is permitted. If there is no abutting residential zone, any residential use permitted in the nearest residential zone to the lot is permitted.

[2] If nearest residential zone is R-4, R-5, R-6, or R-7 or if first floor is used for commercial purposes.

Dimensional Requirements– I-M and B-2

Space & Bulk Standards	I-M	B-2
Minimum Lot Size	Correctional prerelease facilities: Ten thousand (10,000) square feet. Other uses: None.	None
Minimum Street Frontage	60’	20’
Front Yard Setback	Minimum front yard: Principal and accessory structures in the I-M and I-Ma zone: Each structure shall be set back one (1) foot from the front property line for each one (1) foot of building height.	No more than 10 feet, except that the Planning Board or Planning Authority may approve a different amount for irregularly shaped lots or lots with frontage less than 40 feet provided this standard is met to the maximum extent practicable
Rear Yard Setback	Principal and accessory structures in the I-M and I-Ma zone: Each structure shall be set back one (1) foot from the rear property line for each one (1) foot of building height, up to twenty-	10 ft except for accessory structures 5 ft

	five (25) feet, except that the minimum rear yard shall be thirty-five (35) feet when the rear property line abuts a residential zone.	
Min Side Yard	Principal and accessory structures in the I-M and the I-Ma zone: Each structure shall be set back one (1) foot from each side property line for each one (1) foot of building height, up to twenty-five (25) feet, except that the minimum side yard shall be thirty-five (35) feet when the side property line abuts a residential zone.	None except for accessory structures 5 ft
Max Side Yard on Side Street	None	(not outlined in ordinance)
Min Side Yard on Side Street	None	None
Structure Stepbacks	None	Portions of a structure above 35 feet shall be no closer than 5 feet from the side property line and no closer than 15 feet from the rear property lone when such property line abuts a residential zone
Max Building Height	75'	45 feet except as provided for below: a. 50 feet if first floor is partially or wholly occupied by commercial use b. 65 feet in B-2 and B-2c zones on lots >5 acres provided that all setbacks, except for front yard setbacks and side yard on side street setbacks, increase by 1 foot for each feet of height over 45 feet c. 65 feet within 65 feet of Franklin Street
Max Floor Area	None	(not outlined in ordinance)
Min Lot Area / Unit	None	a. Off-peninsula locations, as defined in section 14-47: 1500 sf, except as provided for in b b. On-peninsula locations (as per 14-47) and projects with active street frontages, as defined in section 14-188 below: 435 sf
Max impervious surface	75%	For residential uses: none For all other permitted uses: 80% in B-2 and B-2 c For all other permitted uses: 90% in B-2b

VI. POLICY ANALYSIS

The applicant has submitted an analysis of the project's conformance with the Comprehensive Plan (refer to **Attachment B**). Staff have identified the following goals and policies which are relevant to the proposed map amendment and find the proposal in conformance with economic development goals of the Comprehensive Plan, as well as the future land use vision. As stated, the purpose of the I-M zone is:

- The moderate impact industrial zones are intended to provide zones in areas of the city in which light and moderate impact industrial and transportation-related uses will coexist.

- The moderate impact industrial (I-M and I-Ma) zones are located on arterials or collectors. The I-Mb zones are similarly located on the peninsula. These locations provide for direct access onto arterials, thereby protecting residential neighborhoods from drive-through traffic.

- The I-M, I-Ma and I-Mb industrial zones are intended to provide for larger industrial buildings and for the limited or controlled use of areas outside of structures for storage of materials and machinery. These facilities often require large volumes of imported materials and products which result in large volumes of shipping and receiving. Often uses may be highway-oriented and transportation-related, thus relying on citywide and regional transportation infrastructure.

- Industrial uses in the moderate impact industrial zones may require separation from higher impact uses, which should be directed to the high impact industrial zone.

The central vision of Portland's Plan 2030 is represented by the Venn diagram demonstrating the integral interrelation of the community's core belief that Portland is equitable, sustainable, connected, dynamic, authentic and secure. The vision conveys the message of the City's need to balance many competing needs to assure the advance of the vision as a unified concept. In this instance, that the City's goals for job growth and transforming Portland through orderly growth and development be balanced with needs for connectivity of the street grid, sustainability of infrastructure and the ability to maintain that infrastructure, and security in the sense of public safety. Applicable policy includes the following:



<u>A Vibrant City</u>
Promote an economic climate that increases job opportunities and overall economic well-being.
2. SUPPORT LOCAL BUSINESS RETENTION AND RECRUITMENT
- Pursue policies that create, nurture, and retain local businesses.
- Support job creation and business growth through public initiatives and private, institutional, and regional partnerships.
- Strengthen City programs and services that support business development.

5. TARGET AREAS FOR JOB GROWTH

- Ensure that new employment can be accommodated in priority growth areas across the City.
- Evaluate zoning and the condition of existing infrastructure in priority areas - downtown, in identified neighborhood nodes, and along transit corridors – to ensure that employment and housing growth can be supported.
- Expand possibilities for live/work spaces – residential living space with integrated creative work space.
- Modify ordinances and make strategic investments to better promote business development and job creation in priority areas.

Portland's Plan 2030's also affirms the continued value of industrial space to the City's economic diversity (see Economy Policy Guide and Future Land Use). Though the uses permitted in B zones also provide a range of uses important to the city, the proposed zoning change aligns with the historic patterns of activity at the site, allows for more cohesive future use, and is consistent with what has been an area of industrial activity, and industrial zoning, for some time.

VII. PUBLIC COMMENT/NEIGHBORHOOD MEETING

The Planning Division mailed 144 notices of this workshop, to property owners within 500 feet of the property. A legal advertisement for the meeting ran on October 3, and October 4, 2020.
This is application is a map amendment regarding property that is already developed. It is not related to a proposed site plan, and a neighborhood meeting was not required. No public comments have been submitted to date.

VIII. NEXT STEPS

- Provide initial feedback on map amendment request
- Obtain Planning Board feedback on the extended rezoning area
- Address any additional information requested by the Planning Board

ATTACHMENTS

Applicant Submission

A - COVER LETTER
B - COMPREHENSIVE PLAN
C - MAP CHECKLIST
D - REDACTED PURCHASE & SALE
E - PLAN OF DIVISION
F - EXISTING ZONING MAP
G - PROPOSED ZONING MAP

BERN
STEIN
SHUR

Bernstein, Shur,
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Portland, ME 04104-5029

T (207) 774 - 1200
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Mary E. Costigan
(207) 228-7147 direct
mcostigan@bernsteinshur.com

February 28, 2020

James Rather
Development Review Services Manager
389 Congress Street
Portland, ME 04101

Subject: Zoning Map Amendment: 7 Rand Road

Dear James:

On behalf of my client, Brockway-Smith Company, we are requesting a zoning map amendment to shift the IM zone line that cuts through the middle of the parcel located at 7 Rand Road, such that the entire parcel would be in the I-M Industrial Zone. One half of the parcel, including one-third of the existing warehouse, is currently located in B-2 Community Business Zone.

Brockway-Smith is under contract to purchase the property and intends to continue to use the property for warehousing, which is permitted in I-M, but not B-2. In addition, Brockway-Smith would like to expand the warehouse, but such expansion would not be allowed in the B-2 Zone. As set forth in the attached Comprehensive Plan analysis, moving the I-M Zone line to encompass the entire warehouse into the I-M Zone is consistent with the City's Comprehensive Plan.

As shown on the attached plan of division, the current owner will retain a portion of the lot, so we are only seeking to amend the zoning on the lot we are purchasing. The highlighted area on the plan of division, as well as the proposed zoning map amendment, show the extent of the zone change request. The zone line would remain the same on the parcel retained by the seller.

Enclosed with this letter are the Comprehensive Plan Analysis, evidence of Right, Title and Interest, the plan of division and the Proposed Map Amendment. Thank you for your consideration. Please contact me directly if you have any questions.

Sincerely,

Mary E. Costigan

cc: Charlie Smith

COMPREHENSIVE PLAN ANALYSIS

PROPOSED MAP AMENDMENT FOR 7 RAND ROAD

At the time the warehouse at 7 Rand Road was constructed in 1972, the City had hand-drawn zoning maps and the zone lines did not always follow the lot lines. The warehouse on the property was constructed such that approximately one third of the building is located in the B-2 Community Business Zone and the remainder is in the I-M Industrial Zone. Although a conforming use in both zones at the time of construction, the warehouse use is now a legally nonconforming use in the B-2 Zone. Moving the zone line to encompass the entire warehouse within the I-M Zone is consistent with the Comprehensive Plan (the "Plan"), as explained in more detail below.

Relevant, Consistent City Goals and Strategies

Economy

- Create economic prosperity by growing Portland's tax and employment base.
- Invest in, attract, and retain human capital to support a growing economy.

As set forth in the Plan, "there are many challenges for Portland's economy, including a scarcity of office, industrial, and commercial space to meet current demand." Moving the zone line to make the entire warehouse a permitted use will enable the future expansion of the warehouse to meet current and future demand. In addition, the future strategies to meet economic goals in the Plan include supporting local business retention and recruitment. Brockway-Smith is a New England business that has had operations in Portland beginning with its first Portland warehouse in Morrill's Corner in 1926. It has had numerous locations in Portland, and as it grows, it continues to retain a presence in Portland. This latest relocation is from Read Street to Rand Road. This proposed map amendment to include an entire warehouse within the IM Industrial Zone is entirely consistent with the Comprehensive Plan and will enable use and expansion of an existing industrial warehouse in an appropriate location for such use.

Transportation

- Support economic vitality by ensuring the efficient movement of goods, services, and people.

Encouraging growth of industrial uses in existing industrial locations, supports continued efficiency in movement of goods. Allowing for such expansion in place also allows for operations to occur from a single location, thus adding to the efficiency.

Future Land Use

- Encourage orderly growth and development in appropriate areas of each community.
- Thoughtful expansion or investment in institutional and industrial sites.

The Future Land Use section of the Plan focuses on areas for future growth while recognizing the changes that will occur to existing facilities and uses, such as the thoughtful expansion of industrial sites.

Based on the above analysis, the proposed zoning map amendment to expand a portion of the I-M Industrial Zone to include the entirety of an existing warehouse is consistent with the Comprehensive Plan.

CITY OF PORTLAND
Planning & Urban Development Department

MAP AMENDMENT SUBMISSION CHECKLIST * Please submit each document and drawing as a separate PDF file * Please submit all drawings in a 24 x 36 sheet size * Please confirm each item by electronically checking the boxes to the left for each document/drawing	
GENERAL APPLICATION DOCUMENTS	
☑	**Project Description** • Cover Letter with detailed project description
☑	**Consistency with Comprehensive Plan** • Analysis of the consistency of the zone change request with the goals, policies and land use plan of Portland's Comprehensive Plan.
☑	**Completed Checklist – Map Amendment Application** **(this document)**
☑	**Right, Title and Interest** • Deeds, leases, or purchase and sales agreements
PLANS	
☑	**Vicinity Map**
☑	**Proposed Map Amendment** (please use the Portland zoning map as a reference)
☐	**Site Plan (if applicable)** Provide a site plan of the property showing existing and proposed improvements, including such features as buildings, parking, driveways, walkways, landscape and property boundaries.

PURCHASE AND SALE AGREEMENT

This Purchase and Sale Agreement (the "Agreement") is dated effective as of the date the last party signs on the signature page below (the Effective Date"), by and between Rand Road Holdings, LLC, a limited liability company organized under the State of Maine having a principal place of mailing address at c/o Spinnaker Trust, 123 Free Street, Portland, ME 04101 ("Seller") and Brockway-Smith Company, a Massachusetts corporation with a mailing address of 35 Upton Drive, Wilmington, MA 01887 ("Buyer").

RECITALS:

A. Seller owns certain real property consisting of approximately 33.50 acres of land (the "Land") with an approximate 242,965 square foot industrial building ("Building") located at 7 Rand Road, Portland, Maine described in deed recorded in Cumberland County Registry of Deeds Book 31342, Page 191 and described on the City of Portland Tax Assessors Map 262-A-1, 263A-A-10 and 264-B-1, more particularly described on EXHIBIT A attached hereto, including all right, title and interest of Seller in and to any rights of way, privileges and appurtenances pertaining thereto, including, without limitation, any street adjoining any portion of the land and any air and development rights related to the land if any (the "Site"); and

B. Seller wishes to sell to Buyer, and Buyer wishes to purchase from Seller, upon the terms and conditions of this Agreement, a portion of the Site consisting of:

(1) A portion of the Land to be referred to and depicted as the "Building Parcel" (as hereinafter provided), which is generally depicted on Exhibit B (the "Preliminary Plan") attached hereto. The specific layout of the Building Parcel shall be mutually agreed upon by Buyer and Seller, and depicted on the Lot Division Plan (defined in Section 3.1(3) below) to be delivered by Seller to Buyer and shall include any rights of way, privileges and appurtenance pertaining thereto including, without limitation, any street adjoining any portion of the Building Parcel and any air development rights relating to the Building Parcel, if any, to the extent transferable.

(2) The Building and all buildings, structures and other improvements located on the Building Parcel (collectively, "Improvements") and all equipment and fixtures including, but not limited to, heating, cooling, plumbing, electrical and ventilation equipment, boilers, burners, heaters, plumbing and bathroom fixtures, electrical and lighting equipment and fixtures and all window treatments and all of Seller's right, title and interest in and to the building related equipment of any kind located on the Site or within the Building whether affixed to the Building or otherwise located at the Site on the date hereof; but not including any of the foregoing owned by [redacted] ("Personal Property").

(3) All of Seller's transferable right, title and interest, if any, in and to any and all licenses, permits, agreements, approvals, privileges or warranties relating to the Building Parcel, the Improvements or the Personal Property (the "Approvals").

The Building Parcel, the Improvements, the Personal Property and the Approvals shall collectively be referred to as the "Property".

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C. The conveyance of the Property shall include perpetual nonexclusive easements and a right of way to use the existing driveway leading from Rand Road, for the purposes described in Section 1.2 below, which shall be located on the portion of the Site retained by Seller which shall be referred to and depicted as the "Retained Parcel" on the Lot Division Plan (the "Retained Parcel"), and certain utility easements in and over the Retained Parcel as described at Section 1.2 below.

NOW, THEREFORE, in consideration of the mutual covenants and conditions contained herein, Seller and Buyer hereby agree as follows:

1. **AGREEMENT OF PURCHASE AND SALE: PURCHASE PRICE**

1.1 **Agreement of Purchase and Sale**. In accordance with and subject to the terms and conditions of this Agreement, Seller agrees to sell and convey the Property to Buyer and Buyer agrees to purchase and accept the Property from Seller. Seller agrees that the title to be conveyed to Buyer shall be fee simple title.

1.2 **Easements.** The conveyance of the Property shall include (i) a perpetual, nonexclusive easement and right of way to use the existing driveway leading from Rand Road on the Retained Parcel shown on EXHIBIT B for pedestrian and vehicular access and egress to the Property, (ii) the perpetual easement to use, operate, repair, maintain and replace any currently existing utility lines, water and sewer lines and stormwater drainage pipes, swales, ponds and facilities now serving the Property and located through, over and under the existing driveway and/or Retained Parcel; and (iii) the perpetual nonexclusive easement to locate, use, operate, repair, maintain and replace a below ground natural gas line, and related appurtenant facilities, which connects to natural gas distribution line on the land now or formerly of Brixmor SPE 4 LP to the Property, pursuant to and in compliance with that certain Easement Agreement between Brixmor SPE 4 LP and Northern Utilities, Inc. d/b/a Unitil, dated December 29, 2016 and recorded in said Registry of Deeds in Book 33739, Page 180. The driveway easement and such other easements shall each be in form reasonably satisfactory to Buyer and Seller.

1.3 **Purchase Price.** The purchase price (the "Purchase Price") for the Property shall be [redacted], subject to credits, prorations and other adjustments as provided for in this Agreement.

1.4 **Payment of the Purchase Price.** Buyer will pay the sum of [redacted] as an Earnest Money Deposit upon full execution hereof. Such Earnest Money Deposit shall be payable to Jensen Baird Gardner & Henry (the "Escrow Agent"), to be held in escrow in accordance with the terms of this Agreement. Upon expiration of the last to expire of the Inspection Period (as defined at Section 4), the Plan Review Period (as defined at Section 3.1(3)) or the Survey Review Period (as defined at Section 2.3(1)), if this Agreement is not otherwise terminated, Buyer shall increase the Earnest Money Deposit to [redacted], at which point the Earnest Money Deposit shall be non-refundable, except for (a) a default, beyond any applicable defined cure period, by Seller under this Agreement, (b) Seller's refusal or inability to close; (c) failure of any of the conditions to close or (d) any other provision of

this Agreement which provides for a refund of the Earnest Money Deposit. Buyer shall pay the balance of the Purchase Price to Seller in immediately available funds via federal wire transfer to the Seller's designated account on the Closing Date (as defined at Section 6.1) and as provided herein, subject to the credits and prorations set forth in this Agreement.

2. CONDITION OF TITLE; SURVEY MATTERS

2.1 **Title and Title Condition.** It shall be a condition to the Closing that Seller shall convey good and clear record and marketable title to the Property free from any encumbrances or other title defects, except for utility easements benefiting the Property and which are not Unpermitted Exceptions as defined at Section 2.2(l), and except for other encumbrances and title defects which Buyer agrees to accept. Seller shall within seven (7) days of the Effective Date provide Buyer with a copy of any title insurance policy or commitment in Seller's possession or control relating to the Site. Buyer shall, at its sole cost and expense, have the title to the Property examined. Buyer shall give written notice ("Title Defect Notice") to the Seller no later than forty-five (45) days from the Effective Date ("Title Review Period") if such title examination discloses any title defect which is unacceptable to Buyer in its sole and absolute discretion (collectively, "Unpermitted Exceptions"). Any matter of record title as of the effective date of Buyer's title examination which is not the subject of a Title Defect Notice, shall be conclusively deemed waived by Buyer and shall constitute a "Permitted Exception, except for mortgages or other liens which shall constitute Unpermitted Exceptions whether or not included in the Title Defect Notice."

2.2 **Title Defects**.

(1) If Buyer gives a Title Defect Notice to Seller in accordance with the provisions of 2.1 above, then with respect to any Unpermitted Exception which is a mortgage or similar encumbrance created voluntarily by Seller and which secures only the payment of a stated indebtedness ("Monetary Lien"), Seller shall either (a) pay the amount necessary to remove such Monetary Lien from the record title to the Property and will, on or prior to the Closing Date, obtain a recordable instrument or other documentation sufficient to cause Buyer's title insurance company to delete such matter from an owner's title insurance policy to be issued to Buyer at standard rates, or (b) in the case only of a Monetary Lien securing the payment of a mortgage held by an institutional lender pay on the Closing Date the sum required to remove such Monetary Lien from the record title out of the Purchase Price to be received at the Closing pursuant to arrangements acceptable to Buyer and Buyer's counsel. With respect to any Unpermitted Exception which is not a Monetary Lien ("Nonmonetary Encumbrance"), Seller shall notify Buyer, within ten (10) days after Seller's receipt of the Title Defect Notice, whether Seller will attempt to cure such Nonmonetary Encumbrance. If Seller does not agree to attempt to cure such Nonmonetary

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Encumbrance by notice given to Buyer on or before the expiration of said ten (10) day period, Buyer shall have the right, by notice given to Seller within ten (10) days after the earlier to occur of the expiration of said ten (10) day period or Buyer's receipt of Seller's notice, either to waive the Nonmonetary Encumbrance without abatement or reduction of the Purchase Price, or terminate this Agreement. If Seller agrees to attempt to cure the Nonmonetary Encumbrance, then Seller shall use best reasonable efforts to cure or remove such Nonmonetary Encumbrance. If after using best reasonable efforts, Seller has not removed or cured any Nonmonetary Encumbrance within thirty (30) days of Seller's receipt of a Title Defect Notice, Buyer shall, as its sole remedy and either (a) accept title to the Property subject to such Nonmonetary Encumbrance, in which case any Nonmonetary Encumbrance identified in the Title Defect Notice which Seller has not cured or removed shall constitute a Permitted Exception and the Closing shall occur without any credit against or abatement of the Purchase Price on account thereof; or, (b) elect to terminate this Agreement, in which case the Earnest Money Deposit, together with all interest, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

(2) If prior to the Closing an updated title report shows any new matter which did not appear on the record title to the Property as of the effective date of the initial title examination performed by Buyer which is not acceptable to Buyer in Buyer's sole discretion, then Buyer shall have the right to give Seller written notice of any such new matter which shall then be deemed to be an Unpermitted Exception and in such instances the parties shall have the same rights and obligations as to such new Unpermitted Exception as stated in Section 2.2(1) above.

2.3 **Survey**.

(1) Seller shall within seven (7) days of the Effective Date provide Buyer with copies of all surveys, site plans, building plans or similar plans in Seller's possession or control which relate to the Site. Buyer may, at Buyer's expense, either before or after receipt of the Lot Division Plan (as defined at Section 3.1(3)), arrange for the preparation by a surveyor or engineer ("surveyor"), of a new or updated ALTA/NSPS Survey of the Property (the "ALTA/NSPS Survey", which shall include the Lot Division Plan as provided at Section 3.1(3)), certified to Buyer and the Buyer's title insurance company, and if Buyer elects to have a new or updated survey prepared, Seller shall cooperate with Buyer and the surveyor to enable the surveyor to prepare an ALTA/NSPS Survey, including, without limitation, providing the surveyor and Buyer with any and all surveys or records of the Site in the possession or control of Seller and permitting the surveyor to have access to the Site. Buyer shall have given written notice to Seller ("Survey Defect Notice") not later than thirty (30) days from the date Buyer receives the Lot Division Plan of any survey matter, zoning compliance issues survey related exceptions or any survey exceptions that the Buyer's title company indicates will appear on a title insurance policy which are not

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acceptable to Buyer in Buyer's sole discretion ("Unpermitted Survey Exceptions"). Any such exceptions or survey matters which are shown on the Lot Division Plan or on any other ALTA/NSPS Survey obtained by Buyer which are not set forth in a Survey Defect Notice within said thirty (30) day period ("Survey Review Period") shall be deemed approved. Seller shall notify Buyer, within ten (10) days after Seller's receipt of the Survey Defect Notice, whether Seller will attempt to cure such Unpermitted Survey Exceptions. If Seller does not agree to attempt to cure such Unpermitted Survey Exceptions by notice given to Buyer on or before the expiration of said ten (10) day period, Buyer shall have the right, by notice given to Seller within ten (10) days after the earlier to occur of the expiration of said ten (10) day period or Buyer's receipt of Seller's notice, either to waive the Unpermitted Survey Exceptions without abatement or reduction of the Purchase Price, or terminate this Agreement. If Seller agrees to attempt to cure the Unpermitted Survey Exceptions, then Seller use best reasonable efforts to cure or remove such Unpermitted Survey Exceptions. If after using best reasonable efforts, Seller has not removed or cured any Unpermitted Survey Exceptions within sixty (60) days of Seller's receipt of a Survey Defect Notice, Buyer shall, as its sole remedy either (a) accept title to the Property subject to such Unpermitted Survey Exceptions, in which case any Unpermitted Survey Exceptions identified in the Survey Defect Notice which Seller has not cured or removed shall constitute a Permitted Exception and the Closing shall occur without any credit against or abatement of the Purchase Price on account thereof; or, (b) elect to terminate this Agreement, in which case the Earnest Money Deposit, together with all interest, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

(2) If prior to the Closing, any encroachments or other survey exceptions which did not appear on the Lot Division Plan or on any ALTA/NSPS Survey obtained by Buyer are discovered which are not acceptable to Buyer, in Buyer's sole discretion, then Buyer shall have the right to give written notice of any such newly discovered survey exception to Seller and in such instances the parties shall have the same rights and obligations as to such newly discovered survey exception as stated in Section 2.3(1) above.

2.4 **Title Insurance Policy**. It shall be a condition to Buyer's obligations to purchase the Property that Buyer may obtain an owner's (and lender's, if applicable) policy of title insurance at normal premium rates insuring title to the Property free from any encumbrances except for the Permitted Exceptions.

3. **APPROVALS AND CONDITIONS**

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3.1 **Conditions**. The obligations of Buyer under this Agreement shall be subject to and contingent upon the satisfaction of the following conditions within the time periods specified below:

(1) **Approval of Title**. Buyer shall have approved the condition of title and survey of the Property pursuant to Sections 2.1 through 2.3 above within the time periods provided therein.

(2) **Title Policy**. Buyer (and Buyer's lender, if applicable) shall (if elected to do so) have received a commitment to obtain the title insurance policy(ies) described in Section 2.4.

(3) **Division**.

a. The specific boundaries of the Building Parcel and the Retained Parcel shall be mutually agreed upon by Buyer and Seller and if Buyer and Seller for any reason are not able to agree upon the boundaries of the Building Parcel and the Retained Parcel, this Agreement shall terminate and the Earnest Money Deposit shall be returned to Buyer.

b. Seller shall, at Seller's sole cost and expense, arrange for the preparation, by a surveyor or civil engineering firm reasonably acceptable to Buyer, of a plan in recordable form ("Lot Division Plan") which sets forth the Building Parcel and the Retained Parcel as mutually agreed upon by Buyer and Seller. The Lot Division Plan shall show the location of all Improvements on the Site including, but not limited to the Building, the location of all existing utility, water and sewer lines and all drainage facilities on the Site and shall identify the driveway easement and all other easements which are to be granted to Buyer in accordance with Section 1.2. The Lot Division Plan and the division of the Site into the Retained Parcel and the Building Parcel shall establish to the satisfaction of the Buyer in its sole discretion that the Property (including the Building and any other existing Improvements or the Building Parcel) conforms in all respects to any and all applicable municipal, state and other government regulations including, but not limited to, applicable zoning and land-use laws (including, but not limited to, set back requirements, frontage requirements, lot size requirements and building and impervious coverage ratios), that the Property abuts and has access to a public way duly laid out by the City of Portland and has access to all utility, water and sewer lines and drainage facilities. Seller shall cooperate with Buyer in the division of the Site and shall allow Buyer to consult with Seller and Seller's surveyor or engineer in connection with the preparation of the Lot Division Plan. Buyer shall have a period of thirty (30) days from the delivery of the completed Lot Division Plan ("Plan Review Period") to review the Lot Division Plan and if Buyer is not satisfied in Buyer's absolute discretion with the Lot Division Plan, Buyer

may terminate this Agreement prior to the expiration of the Plan Review Period.

c. The Closing shall be contingent upon Seller, at Seller's sole cost and expense, obtaining any necessary municipal or other approvals for the subdivision of the Site pursuant to the Lot Division Plan (as finally approved by Buyer) and if Seller determines that such approvals are not required, the Closing shall be contingent upon Buyer's confirmation, in Buyer's sole judgment, that such approvals are not required and if Buyer does not so confirm such determination, Buyer may terminate this Agreement. If Buyer elects to terminate this Agreement pursuant to this subsection, the Earnest Money Deposit, together with all interest, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

(4) **Improvements; Building Addition**. Buyer's obligations are contingent upon Buyer's determination, in Buyer's sole discretion, that the division of the Site as set forth in the Lot Division Plan allows for the installation of a fire lane in compliance with all laws and regulations of the City of Portland including, but not limited to, applicable zoning requirements to be installed around the perimeter of the Building, and for the Property to provide sufficient "unimproved space" in compliance with applicable zoning requirements to enable Buyer to construct a 100,000 square foot addition to the Building to be located in the direction of Rand Road and the existing parking lots towards the railroad tracks as depicted on Exhibit B. If Buyer is not satisfied in Buyer's sole discretion, that the division of the Site will allow the installation of such fire lane or provide such sufficient "unimproved space", Buyer may terminate this Agreement prior to the expiration of the Plan Review Period. If Buyer elects to terminate this Agreement pursuant to this subsection, the Earnest Money Deposit, together with all interest, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

(5) **Inspection of Property and Due Diligence Evaluation.** Buyer shall have a period of forty-five (45) days from the Effective Date ("Inspection Period") to determine, in Buyer's sole, absolute discretion, that Buyer is satisfied with the physical and environmental condition of the Property, and is satisfied, in its sole, absolute and subjective discretion, as to the feasibility of acquiring, owning and further developing the Property, as contemplated by Buyer, and operating the Property for the use and in the manner contemplated by Buyer. During such Inspection Period, Buyer shall have access to the Property for the purpose of making inspections, investigations, and tests thereof including, but not limited to, building and system inspections and such tests, borings and inspections which Buyer deems

necessary to determine if there are any hazardous wastes, hazardous substances, oils or hazardous materials in, on, under or about the Property. Seller shall make available to Buyer all environmental studies or reports in Seller's possession or control, wetland delineation reports, geological reports, prior land use permit applications filed by Seller and decisions obtained by Seller with the City of Portland, State of Maine or any federal agency having jurisdiction, to Buyer within ten (10) days from the Effective Date. Buyer shall comply with all applicable laws, rules and regulations in connection with its inspections and/or investigations of the Property and all matters related thereto. Any and all costs and expenses of Buyer's inspection/investigation of the Property shall be borne by Buyer. Buyer shall indemnify and hold Seller harmless against any and all damage to the Property, liability for mechanic's liens or personal injury, arising out of Buyer's inspections and investigations of the Property. It is expressly agreed that the foregoing indemnity shall be deemed to survive the Closing or the termination of this Agreement. Buyer agrees that upon Seller's request Buyer will provide to Seller and to cause each of its agents, contractors, subcontractors, consultants and other representatives who enter upon the Property to provide to Seller, prior to any such entry, evidence of insurance covering the activities to be conducted by Buyer and its employees, agents, contractors subcontractors, consultants and representatives.

If Buyer is not satisfied with the results of Buyer's inspections and investigations, Buyer may terminate this Agreement by written notice to Seller prior to the end of the Inspection Period. If Buyer fails to terminate this Agreement prior to the expiration of the Inspection Period, Buyer shall be conclusively deemed to have waived the right to terminate under this Section 3.1(5). If Buyer elects to terminate this Agreement pursuant to this subsection, the Earnest Money Deposit, together with all interest, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

(6) **Possession; Condition of Property**. At Closing, Seller shall deliver full possession of the Property to Buyer free of all leases, tenancies and occupancies of any person or entity other than [redacted] ____, [redacted]. As of the Closing, the Property shall not be in material violation of any applicable law or regulation of any governmental authority. The physical condition of the Property at the Closing shall be in substantially similar condition as compared to such condition as of the close of the Inspection Period, subject to the expansion of Tenant's leased space and related changes in the configuration of Tenant's leased space generally as depicted on Exhibit C attached hereto. If Seller is unable to deliver possession to Buyer as hereinabove provided or if as of the Closing, the Property is in material violation of any such law, regulation or governmental authority or the physical condition of the Property is not in substantially

similar condition as compared to such condition as of the close of the Inspection Period, as hereinabove provided, Buyer may terminate this Agreement by written notice to Seller. If Buyer terminates this Agreement pursuant to this subsection, the Earnest Money Deposit together with all interest shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease and this Agreement shall be null and void without recourse to the parties.

(7) **Lease Matters.** The Closing shall be contingent upon Buyer's receipt of an estoppel certificate from the Tenant in the form of EXHIBIT D attached hereto. If Seller is unable to deliver such estoppel certificate or if the estoppel certificate delivered by the Tenant indicates a landlord default or other materially adverse fact, Buyer may terminate this Agreement by written notice to Seller. If Buyer terminates this Agreement pursuant to this subsection, the Earnest Money Deposit together with all interest shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease and this Agreement shall be null and void without recourse to the parties.

(8) **Flood Zone; Restrictions**. The Closing shall be contingent upon Buyer's determination that the Property is not located in a flood plain area or flood plain zone or any such other flood prone area as determined under the Rules and Procedures of the Federal Flood Insurance Program and that Buyer's use and further development of the Property as contemplated by Buyer will not be prohibited or substantially interfered with by any applicable law, regulation or ordinance relating to wetlands, conservation, land preservation or similar classifications or zoning ordinances or by any easement, restriction or other agreement. If Buyer's not satisfied with its determination, Buyer may terminate this Agreement at any time prior to the expiration of the Survey Review Period. If Buyer elects to terminate this Agreement pursuant to this subsection, the Earnest Money Deposit, together with all interest, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

3.2 **Consequences of Termination of this Agreement.** If this Agreement is terminated by Buyer pursuant to Sections 2.2, 2.3, 2.4, 3.1, 6.7, 7.1, 8.1 or any other section specifically referring to this Section 3.2, then the following shall occur: (i) Buyer shall return to Seller all documents delivered by Seller to Buyer pursuant to this Agreement; (ii) Buyer shall deliver copies of all studies, reports, plans and surveys, including the ALTA/NSPS Survey, in Buyer's possession or control to Seller, and (iii) Seller shall promptly cause the return of the Earnest Money Deposit to Buyer. Upon completion of all of the foregoing, this Agreement shall be deemed terminated and neither party shall have any further rights against nor obligations to the other hereunder or in connection herewith except to the extent that any provision of this Agreement specifically survives any termination.

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4. **WARRANTIES.**

4.1 **Representations of Buyer**. Buyer represents for the benefit of Seller that the following facts are true and correct as of the execution of this Agreement and shall be true and correct as of the Closing Date:

(1) **Organization**. Buyer is a corporation duly organized and validly existing under the laws of the Commonwealth of Massachusetts with the full corporate power to enter into this Agreement.

(2) **Authority**. The authority, execution and delivery of this Agreement and the consummation of the transactions contemplated hereby have been duly authorized and approved by all requisite action of Buyer and no other authorizations or approvals whether of governmental bodies or otherwise are necessary in order to enable Buyer to enter or to comply with this Agreement.

(3) **Binding Effect of Documents**. This Agreement and the other documents to be executed by Buyer hereunder, upon execution and delivery thereof by Buyer, will have been duly entered into by Buyer, and will constitute legal, valid and binding obligations of Buyer, enforceable against Buyer in accordance with their terms. Neither this Agreement nor anything provided to be done under this Agreement violates or shall violate any contract, document, understanding, agreement or instrument to which Buyer is a party or by which it is bound.

4.2 **Representations of Seller**. Seller represents for the benefit of Buyer and Buyer's successors and assigns that the following facts are true and correct as of the execution of this Agreement and shall be true and correct as of the Closing Date and shall survive the Closing Date.

(1) **Organization**. Seller is a limited liability company duly organized and validly existing under the laws of the State of Maine with full power to enter into this Agreement.

(2) **Authority**. The execution and delivery of this Agreement and the consummation of the transactions contemplated hereby have been duly authorized and approved by all requisite action of Seller, and no other authorizations or approvals, whether of governmental bodies or otherwise, are necessary in order to enable Seller to enter into or to comply with the terms of this Agreement.

(3) **Binding Effect of Documents**. This Agreement and the other documents to be executed by Seller hereunder, upon execution and delivery thereof by Seller, will have been duly entered into by Seller, and will constitute legal, valid and binding obligations of Seller, enforceable against Seller in accordance with their terms.

(4) **Condemnation Proceedings**. Seller has received no written notice of any condemnation proceedings, eminent domain proceedings or similar actions or proceedings against the Property or any municipal betterments or special assessments proposed with respect to the Property.

(5) **Foreign Person**. Seller is not a foreign person and is a "United States Person" as defined in Section 7701(a)(30) of the Internal Revenue Code, as amended.

(6) **Violations**. Seller has no knowledge relative to the Property being in violation of, (A) any of the Approvals or any conditions thereof, (B) any easement, restrictive covenant or other matter of record affecting the Property or any part thereof, (C) any laws, statutes, ordinances, codes, regulations, rules, orders, or other requirements of any local, state or federal authority or any other governmental entity or agency having jurisdiction over the Property or any part thereof, including, without limitation, any of the foregoing affecting zoning, land-use, subdivision, building, health, traffic, environmental, hazardous waste or flood control matters (all of the foregoing items in (C), collectively, called the "Governmental Regulations").

(7) **Litigation**. Seller has no knowledge of any suits, actions or proceedings pending or threatened against or affecting the Property or which would prevent Seller from performing any of the transactions to be performed by Seller herein before any court or administrative agency or officer.

(8) **Hazardous Materials.** During the time of Seller's ownership of the Property, Seller has no knowledge of the release of any hazardous substance, hazardous waste, hazardous materials or oil or other petroleum products at the Property or into the environment from the Property, except as previously disclosed to Buyer in a Phase I Environmental Site Assessment prepared by St. Germain Collins dated October 22, 2018, St. Germain Collins File No. 3602-0001.

(9) **No Lease**. Seller has not entered into any leases, licenses or other occupancy agreements (written or verbal) which grant any possessory interest in and to any portion of the Property and that remain in effect other than the Lease, or that otherwise give rights with regard to the use of the Property, maintenance or service contracts or other agreements which will affect the Property after the Closing.

(10) **No Options.** There are no purchase options, purchase contracts, or other agreements, written or oral, whereby any person could claim a legal or equitable right, title or interest in the Property or any portion thereof.

(11) **No Citations**. Seller has no knowledge of any written notice or citation from (i) any federal, state, county or municipal authority alleging any fire, health, safety, building, pollution, environmental, zoning or other violation of any law, regulation, permit, order or directive in respect of the Property

or any part thereof, which has not been entirely corrected in accordance with applicable law; or (ii) any insurance company or bonding company of any defects or inadequacies in the Property or any part thereof, which would adversely affect the insurability of the same or of any termination or threatened termination of any policy of insurance or bond.

(12) **No Default**. Performance of this Agreement will not result in a breach of, constitute a default under, or result in the imposition of a lien or encumbrance upon the Property under any agreement instrument, covenant, restriction, or organizational documents by which Seller or the Property is bound, and Seller is not prohibited from consummating the transactions contemplated herein by any law or regulation, agreement, instrument restriction, order or judgment.

(13) **No Bankruptcy**. No bankruptcy or insolvency proceeding under the Bankruptcy Code or any state bankruptcy or insolvency law filed by or against Seller is pending and no such filing is contemplated by Seller, or, to Seller's knowledge, threatened.

(14) **No Rights**. Seller has no knowledge of any existing rights (e.g., rights of first refusal) or other consents or waivers required for the completion of the delivery of the deed.

(15) **No Underground Storage Facilities**. Seller has no knowledge of underground storage facilities or other subsurface storage facilities used to hold petroleum products or other hazardous materials now in use or previously abandoned at the Property.

(16) **Municipal Water and Sewer**. The Property is serviced by municipal water and sewer. Seller has no knowledge of an onsite subsurface water disposal system at the Property.

(17) **No Tax Liability**. Seller has no knowledge of Seller owing any past due taxes to the State of Maine.

(18) **No Sanctions**. Seller has no knowledge of being subject to sanctions of the United States government or, to Seller's knowledge, in violation of any federal, state, municipal or local laws, statutes, codes, ordinances, orders, decrees, rules or regulations.

(19) **Challenges.** Seller has no knowledge of any claim by any third party which challenges or disputes Seller's title to the Site or any dispute or disagreement as to the location of the boundary lines of the Site.

All warranties and representations of Seller set forth in this Agreement shall survive the Closing Date. For the avoidance of doubt, Buyer acknowledges that the Property is being sold in its "as-is" and "where-is" condition, with all faults, and without Seller's representation as to warranties as to the physical condition of the Property, or issues ascertainable from public record.

4.3 **No Warranties or Representations**. Except as expressly stated in this Agreement, Buyer agrees that Seller has not made, does not make and specifically negates and disclaims any representations, warranties, promises, covenants, or agreements of any kind or character, whether express or implied, oral or written, past, present or future, of, as to, concerning or with respect to the value, nature, quality or condition of the Property, or the suitability of the Property for any and all activities and uses which Buyer may conduct thereon.

4.4 **Documents Provided by Seller**. Buyer agrees that any information, documentation, studies, permits and/or analysis which are in Seller's possession that pertain to the Property, including but not limited to, those items referred to in Section 2.3 which Seller makes available to Buyer are provided for Buyer's convenience only and Seller makes no representation or warranty whatsoever as to the accuracy or the completeness thereof or information contained therein or as to the condition of the Property (except as provided in this Article 4) or any rights related to the possible development of the Property.

5. ADDITIONAL AGREEMENTS OF BUYER AND SELLER

5.1 **Right of Entry**. Buyer and its representatives, employees, contractors, agents and designees shall have the right to enter upon the Site and enter the Building upon twenty-four (24) hours' advance telephone or e-mail notice, at Buyer's sole cost and expense, during normal business hours prior to the Closing Date, in order to inspect and investigate the Property or its environmental condition and, subject to Section 3.1(3) hereinbefore, to conduct any and all tests, surveys and studies Buyer deems necessary or convenient. Buyer shall indemnify Seller against and hold Seller and the Property free and harmless from any damage to the Property arising out of any such entry, testing, and investigation by Buyer or its representatives, employees, agents, contractors, or designees. Should Buyer conduct or cause environmental studies to be conducted, Buyer shall cause all residue or product samples relating thereto to be disposed of in full compliance with applicable law. Buyer shall restore the Property to its existing condition subsequent to the completion of all of Buyer's investigations or inspections of the Property or upon the conclusion of the Inspection Period, whichever shall first occur.

5.2 **Seller Covenants**. Seller agrees that so long as this Agreement is in effect:

(1) **Occupancy**. Seller shall not permit occupancy of or enter into any new lease, license or other occupancy agreement for space in or on the Property, or any portion thereof, except for the Lease.

(2) **Contracts**. Seller shall not enter into any service or maintenance contract relating to the Property which is not terminable as of the Closing Date. Seller shall terminate any existing service or maintenance contracts as of the Closing Date at Buyer's request; provided that such service or maintenance contracts are terminable without penalty.

(3) **Personal Property**. All Personal Property included in this Agreement shall not be removed from any of the Improvements, unless the same is replaced with similar items of at least equal quality prior to the Closing.

(4) **Insurance**. Seller shall maintain fire and extended coverage and liability insurance coverage on the Property in the same amounts as presently carried by Seller.

If the Property has been damaged by fire or other casualty and is not fully repaired at the time of the Closing or a proceeding for condemnation or taking by eminent domain of all or any part of the Property shall be commenced, then (unless Buyer terminates this Agreement as provided hereunder), Seller shall convey and Buyer shall accept such title to the Property in such unrestored condition, without reduction to the Purchase Price other than in the amount of the deductible amount, if any, under Seller's property insurance policy applicable to the Property, and Seller shall pay over, and assign to Buyer any insurance proceeds or condemnation awards recovered or recoverable by Seller arising from fire or other casualty to, or condemnation of, the Property which have not been applied by Seller to restore the Property, and Buyer shall receive an assignment of Seller's contract rights against any contractor engaged by Seller to repair the Improvements. Notwithstanding anything to the contrary set forth in this Agreement, in the event that the Building and/or any Improvements to the Property are destroyed or damaged by fire or other casualty prior to the delivery of the deed, Buyer may, at Buyer's option, terminate this Agreement by written notice to Seller and the provisions of Section 3.2 shall be applicable.

(5) **Financing**. Seller shall not execute any new mortgage on the Property or modify the existing mortgage(s) on the Property, or otherwise encumber the Property in an amount which, together with the amount of all other mortgages and monetary liens, will exceed the net amount of the Purchase Price to be received by Seller at the Closing, after deduction (if any) for the adjustments and costs described in Section 6.4 and 6.5 above or create any other new encumbrance or restriction affecting the Property.

5.3 **Representations and Warranties**. Neither Buyer nor Seller will cause any action to be taken that would cause any of the representations or warranties made by such party in this Agreement to be false as of the Closing Date. Each party shall promptly notify the other party in writing of the occurrence of any event or condition which occurs prior to the Closing Date which causes a change in the facts related to the truth of any of the representations or warranties made in Article 4 of this Agreement.

6. **CLOSING DATE**.

6.1 **Closing**. The date of closing ("Closing Date") shall be on a date designated by Seller in a written notice delivered to Buyer ("Closing Notice") which Closing Notice may not be delivered prior to the expiration of the Due Diligence Period,

Title Review Period, Plan Review Period and Survey Review Period and which date may be no sooner than forty-five (45) days after the date of delivery of the Closing Notice. In no event shall the Closing be later than April 1, 2020. If Seller fails to deliver a Closing Notice on or before February 14, 2020, the Closing Date shall be April 1, 2020. The terms "Closing" and "Closing Date" as used herein shall mean the date upon which a Statutory Quitclaim with Covenant deed conveying the Property to Buyer is delivered by Seller to Buyer for recording in the Cumberland County (Maine) Registry of Deeds. Possession shall be delivered at Closing as provided at Section 3.1(6). The Closing shall take place through an escrow pursuant to a mutually agreed upon escrow letter setting forth the terms of the escrow.

6.2 **Buyer's Obligations**. At the Closing Date, Buyer shall deliver to Seller:

(1) The Purchase Price in immediately available funds as provided at Section 1.3.

(2) An executed closing statement.

(3) An executed Assignment and Assumption of the Lease.

(4) An executed Real Estate Transfer Tax Declaration.

6.3 **Seller's Obligations**. On or before the Closing Date, Seller shall deliver to Buyer all of the following:

(1) Statutory Quitclaim with Covenant deed, in form and substance reasonably acceptable to Buyer's counsel, executed and acknowledged by Seller, conveying the Property to Buyer, in its AS-IS and WHERE-IS condition with all faults, free of all liens and encumbrances except Permitted Exceptions.

(2) An executed Maine Real Estate Transfer Tax Declaration.

(3) A copy of the resolutions of the Members of Seller authorizing the execution, delivery and performance by Seller of this Agreement, and designating one or more managers to execute documents, including the deed, in Seller's name in connection herewith, certified as correct and complete by a manager of Seller, together with an incumbency certificate for each person executing documents on behalf of Seller (or other evidence of authority acceptable to Buyer's counsel), a good standing certificate certified by the state of Seller's formation (and State of Maine if required to register therein) and a manager's certificate certifying as to the authorization of Seller to execute and deliver this Agreement and perform its obligations under this Agreement.

(4) A Non-Foreign Affidavit executed by Seller in the standard form.

(5) A standard Seller's Affidavit or other affidavit required by the Buyer's title insurance company to issue a title policy to Buyer (and Buyer's lender, if applicable) without exception as to parties in possession and as to mechanic's or materialmen liens.

(6) An affidavit indicating that Seller is a Maine resident, or in lieu thereof or another applicable exemption, Buyer shall be entitled to withhold and account for 2.5% of the Purchase Price as required by 33 M.R.S. §5250-A.

(7) A notice regarding underground storage tanks pursuant to 38 M.R.S §563.

(8) An executed closing statement.

(9) An Assignment and Assumption of the Lease in form satisfactory to Buyer's counsel.

(10) The estoppel certificate from the Tenant and the Tenant waiver referred to at Section 3.1(7).

(11) An executed Quitclaim with Covenant Bill of Sale conveying the Personal Property.

(12) Such other documents and instruments as may be specifically required in this Agreement or as may be customarily provided by sellers in transactions of this type and reasonably required by Buyer's title insurance company such as a 1099 Form and a W-9 Form; but in any event not including a survey affidavit.

6.4 **Prorations and Adjustments**. Seller shall be responsible for and pay all accrued expenses with respect to the Property accruing up to 11:59 P.M. on the day prior to the Closing Date (the "Adjustment Date") and shall be entitled to receive and retain all revenue from the Property accruing up to such time. On the Closing Date the following adjustments and apportionments shall be made in cash or by closing adjustment as of the Closing Date:

(1) Real estate taxes, personal property taxes, stormwater charges and utility charges, if any, shall be prorated.

(2) Rents, common area payments, tax payments and other payments payable under the Lease shall be apportioned, and the security deposits credited to Buyer.

(3) Seller shall at Closing pay all utility charges according to final readings.

6.5 **Closing Costs**.

(1) Seller shall pay:

i. Preparation charges for Seller's documents;

ii. The cost of any Seller's other obligations under this Agreement;

iii. Seller's share (50%) of the transfer tax due to the State of Maine; and

iv. Recording costs relating to discharging any liens of record.

(2) Buyer shall pay:

i. Recording costs for the deed;

ii. The premium for a standard ALTA Owner's form of Title Policy, including any desired endorsements;

iii. The cost of any of Buyer's other obligations under this Agreement; and

iv. Buyer's share (50%) of the transfer tax due to the State of Maine.

6.6 **Additional Conditions to Buyer's Obligation to Purchase the Property**. In addition to the conditions set forth in Section 3.1, Buyer's obligation to purchase the Property from Seller pursuant to this Agreement is subject to and conditioned upon the fulfillment of each and all of the following conditions precedent, unless waived in writing by Buyer, in Buyer's sole and absolute discretion:

(1) Each and every representation and warranty of Seller contained in this Agreement shall be true and correct in all material respects on the Closing Date.

(2) The title insurance company selected by Buyer shall be unconditionally obligated and committed to issuing the title policy to Buyer as set forth at Section 2.5.

6.7 **Additional Conditions to Seller's Obligation to Convey the Property**. Seller's obligation to convey the Property to Buyer pursuant to this Agreement is subject to and conditioned upon the fulfillment of each and all of the following conditions precedent, unless waived in writing by Seller: (a) each and every representation and warranty of Buyer contained in this Agreement shall be true and correct in all material respects on the Closing Date; (b) Buyer shall have performed the requirements and delivered the documents described in Section 6.2 hereof on or prior to the Closing Date; and (c) Buyer shall have paid the Purchase Price.

7. REMEDIES

7.1 **Seller's Default**. In the event that Seller breaches or shall have failed in any material respect on the Closing Date to have performed any of the covenants and agreements contained in this Agreement which are to be performed by Seller on or

before the Closing Date, any material representation or warranty of Seller herein was untrue when made, or Seller shall have caused any material representation or warranty to become untrue between the date of this Agreement and the Closing Date, then Buyer's sole and exclusive remedy shall be to (i) take any and all legal actions necessary to compel Seller to convey the Property in accordance with the terms of this Agreement (it being acknowledged that damages at law would be an inadequate remedy), and to consummate the transaction contemplated by this Agreement in accordance with the provisions of this Agreement provided however that if the remedy of specific performance is not available because Seller has conveyed the Property (or any portion thereof) to a third party in breach of this Agreement, Buyer may seek to recover Buyer's actual damages, or (ii) to terminate this Agreement whereupon the Earnest Money Deposit, together with all interest thereon, shall be immediately refunded to Buyer, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

7.2 **Buyer's Default**. In the event that Buyer breaches or shall have failed in any material respect on the Closing Date to have performed any of the covenants and agreements contained in this Agreement which are to be performed by Buyer on or before the Closing Date, any material representation or warranty of Buyer herein was untrue when made, or Buyer shall have caused any material representation or warranty to become untrue between the date of this Agreement and the Closing Date, then Seller's sole and exclusive remedy shall be to (i) take any and all legal actions necessary to compel Buyer to purchase the Property in accordance with the terms of this Agreement (it being acknowledged that damages at law would be an inadequate remedy), and to consummate the transaction contemplated by this Agreement in accordance with the provisions of this Agreement, or (ii) to terminate this Agreement whereupon the Earnest Money Deposit, together with all interest thereon, shall be immediately released to Seller, all obligations of the parties hereto (except those which expressly survive termination) shall cease, and this Agreement shall be null and void and without recourse to the parties hereto.

7.3 **Intentionally Deleted.**

8. EMINENT DOMAIN

8.1 **Election to Terminate**. If on or before the Closing Date all or any material part of the Property is taken or threatened to be taken by condemnation or other power of eminent domain, Buyer may, by written notice given to Seller within thirty (30) days after Buyer shall have notice of such taking or threatened taking (and the Closing Date shall be extended if necessary to allow Buyer said thirty (30) day period) elect, in Buyer's sole and absolute discretion, to terminate this Agreement or proceed with the transaction contemplated hereby in accordance with the terms and conditions set forth herein and in the event of a termination of the provisions of Section 3.2 shall be applicable. If Buyer fails to deliver written notice to Seller of its election to terminate this Agreement, then Buyer shall be conclusively deemed to have elected to proceed with this Agreement.

8.2 **Election Not to Terminate.** If on or before the Closing Date any part of the Property is taken or threatened to be taken by condemnation or other power of eminent domain but this Agreement is not terminated by Buyer pursuant to Section 8.1 above, then the Purchase Price shall be reduced (but not below zero) by an amount equal to the sum, if any, that was actually paid to Seller for such taking and Seller shall assign, transfer and set over to Buyer all of Seller's right, title and interest in and to any awards that may in the future be made for such taking or threatened taking.

9. **INDEMNIFICATION.**

9.1 **Breach of Warranty and Representation**. Each party shall hold harmless, indemnify, protect and defend the other from and against any and all claims, liability and losses, and expenses related thereto (including reasonable attorneys' fees), which the indemnified party incurs by reason of a breach of any of the warranties, representations or covenants of the indemnifying party contained in Sections 4.1 and 4.2.

10. **MISCELLANEOUS PROVISIONS.**

10.1 **Brokerage Commissions**. Seller hereby represents and warrants to Buyer that Seller has made no statement or representation nor entered into any agreement with a broker, salesman or finder in connection with the transactions contemplated by this Agreement, except with [redacted]. Buyer hereby represents and warrants to Seller that Buyer has made no statement or representation nor entered into any agreement with a broker, salesman or finder in connection with the transactions contemplated by this Agreement other [redacted]. In the event of a claim for any brokers' or finders' fees or commissions in connection with the negotiation or execution of this Agreement or the transactions contemplated hereby, Seller shall indemnify, hold harmless and defend Buyer from and against such claim if such claim shall be based upon any statement or representation or agreement alleged to have been made by Seller, and Buyer shall indemnify, hold harmless and defend Seller from and against such claim if such claim shall be based upon any statement, representation or agreement alleged to have been made by Buyer.

10.2 **Notices**. Any notice, demand, approval, consent or other communication required or desired to be given under this Agreement in writing shall be directed to the party involved at the address indicated below:

Seller: Rand Holdings, LLC
c/o Spinnaker Trust
123 Free Street

Portland, ME 04101
Attn: Richard Curran
dickcurran@spinnakertrust.com
coneil@spinnakertrust.com
Tel.: 207-553-7106

With a copy to:

Nicholas D. Morrill, Esq.
Jensen Baird Gardner & Henry
Ten Free Street, 4th Floor
P. O. Box 4510
Portland, ME 04112-4510
nmorrill@jbgh.com
Tel.: 207-775-7271

Buyer:

Brockway Smith Company
35 Upton Drive
Wilmington, MA 01887
Attn: Charles Smith, President
csmith@brosco.com
Tel.: 781-475-9100

With a copy to:

Robert C. Dunkless, Esq.
Ottenberg & Dunkless LLP
10 Post Office Square, 7th Floor
Boston, MA 02109
dunkless@odllp.com
Tel.: 617-342-8600

And

Tom Hanson, Esq.
Bernstein Shur
100 Middle Street
P. O. Box 9729
Portland, ME 04104
thanson@bernsteinshur.com
Tel.: 207-228-7335

Any notice, demand, approval, consent or other communication may be given by personal service, recognized overnight air courier or by mail or by e-mail with confirmation by any of the foregoing means. Any notice, demand, approval, consent or other communication given (a) personally shall be deemed delivered upon receipt, (b) by recognized air courier, freight prepaid, shall be deemed delivered on the next business day, (c) by e-mail shall be deemed delivered when sent (provided that confirmation is sent by any of the foregoing means) by and (d) by mail shall be deemed to have been given when two (2) business days have elapsed from the date it was deposited in the United States mail, certified and

postage prepaid, addressed to the party to be served at said address or at such other address of which that party may have given notice under the provisions of this Section 10.2.

10.3 **Modification**. This Agreement may not be modified or amended except by a written agreement executed by Seller and Buyer, and only to the extent set forth therein.

10.4 **Intentionally Omitted**.

10.5 **Form of Documents**. All instruments and documents to be executed and delivered under this Agreement by any party to any other party shall be in form reasonably satisfactory to the other party.

10.6 **Successors and Assigns**. This Agreement shall be binding upon, and shall inure to the benefit of, the successors and assigns of the parties.

10.7 **Duplicate Counterparts**. This Agreement may be executed in duplicate counterparts, all of which together shall constitute a single instrument, and each of which shall be deemed an original of this Agreement for all purposes, notwithstanding that less than all signatures appear on any one counterpart.

10.8 **Section Headings**. The various section headings in this Agreement are inserted for convenience of reference only, and shall not affect the meaning or interpretation of this Agreement or any provision hereof.

10.9 **Exhibits**. All Exhibits attached to, and to which reference is made in, this Agreement are incorporated into, and shall be deemed a part of, this Agreement.

10.10 **Entire Agreement**. This Agreement is the entire agreement of Seller and Buyer with respect to the Property and the transaction contemplated hereby, containing all of the terms and conditions to which Seller and Buyer have agreed. This Agreement supersedes and replaces entirely all previous oral and written understandings, if any, of Seller and Buyer respecting the Property and the transaction contemplated hereby.

10.11 **Time**. Time is of the essence in this Agreement and each and every provision of this Agreement.

10.12 **Governing Law**. This Agreement shall be governed by the laws of the State of Maine.

10.13 **Severability**. If any paragraph, section, sentence, clause or phrase contained in this Agreement becomes or is held by any court of competent jurisdiction to be illegal, null or void or against public policy, the remaining paragraphs, sections, sentences, clauses or phrases contained in this Agreement shall not be affected thereby.

10.14 **Ambiguities Not to be Construed Against Drafting Party**. The doctrine that any ambiguity contained in a contract shall be construed against the party whose

counsel has drafted the contract is expressly waived by each of the parties hereto with respect to this Agreement.

10.15 **Signers' Warranty**. Each individual executing and delivering this Agreement on behalf of an entity hereby warrants and represents to the other party that he or she has been duly authorized and empowered to do so.

10.16 **Facsimile Signatures**. The parties agree that facsimile signatures on this Agreement will be accepted as original signatures hereto.

10.17 **I.R.C. Section 1031 Exchange**. Seller or Buyer may, at Closing, elect to effectuate a like-kind exchange of the Property, with respect to all or a portion of the Purchase Price, with a view toward such exchange qualifying for tax deferred treatment under Section 1031 of the Internal Revenue Code, as amended (the "Code") (the "1031 Election"), by notifying Buyer (or Seller, as the case may be) in writing, at or prior to the Closing, that it is making the 1031 Election. In the event of a 1031 Election, Seller (or Buyer, as the case may be) may, in accordance with the Treasury Department regulations, assign this Agreement to a qualified exchange intermediary ("Qualified Intermediary") of Seller's (or Buyer's, as the case may be) choice to effectuate the exchange. Seller and Buyer agree to cooperate with each other in qualifying for such like-kind exchange and in accordance with and subject to the terms, provisions, and limitations of this Agreement, including, but not limited to, the terms, provisions and limitations of this Section 10.17; provided, however, the party being asked to cooperation shall not have any responsibility, obligation or liability with respect to any such transaction or the effectiveness of the same; and provided, further, the exchange does not delay or postpone the Closing Date. The parties agree to execute such documents and instruments as are reasonably necessary to implement such an exchange, provided such documents and instruments are in form and substance reasonably acceptable to the party executing the same. In no event, however, shall Buyer's (or Seller's, as the case may be) obligations under any other provision of this Agreement be diminished as a result of the 1031 Election or the effectuation of the like-kind exchange contemplated thereby. Similarly, Buyer's (or Seller's, as the case may be) rights under any other provision of this Agreement shall not be diminished nor shall Buyer's (or Seller's, as the case may be) obligations under this Agreement be increased as a result of such election of the effectuation of the like-kind exchange contemplated thereby. Buyer's (or Seller's, as the case may be) sole obligation as to the like-kind exchange shall be to cooperate in good faith with Seller's (or Buyer's as the case may be) efforts to effectuate such an exchange in accordance with and subject to the terms, provisions and limitations of this Section 10.17 and at no cost or expense to Buyer (or Seller, as the case may be).

10.18 **Risk of Loss**. All risk of loss with respect to the Property shall remain with Seller pending closing.

10.19 **Escrow Agent**. Escrow Agent shall be responsible for holding and disbursing the Earnest Money Deposit in accordance with the terms of this Agreement, and the duties and responsibilities of the Escrow Agent shall be determined solely by the express terms and provisions of this Agreement. Escrow Agent shall hold the

Earnest Money Deposit in escrow, in a non-interest bearing account. If there is a dispute regarding the disposition of the Earnest Money Deposit, the Escrow Agent shall not distribute the Earnest Money Deposit until directed by joint written instructions from Seller and Buyer or until receipt of a final judgment of a court with appropriate jurisdiction. As an alternative thereto, Escrow Agent may tender the Earnest Money Deposit into a court appropriate jurisdiction and interplead both parties thereto and thereafter be free from any further obligation to the parties or hereunder. Escrow Agent may decline to act and shall not be liable for failure to act if in doubt as to its duties and responsibilities hereunder. Escrow Agent shall have the right to consult with counsel of its own choosing in the performance of its duties and responsibilities hereunder, and shall not be liable for any action taken in good faith in reliance upon the advice of counsel. Escrow Agent may act upon any instrument or signature reasonably believed by Escrow Agent to be genuine and may assume that any person purporting to give any notice or instruction hereunder, reasonably believed by Escrow Agent to be authorized, has been duly authorized to do so. Escrow Agent is not charged with any knowledge of or any duties or responsibilities, except as set forth in this Agreement. Except for willful misconduct, Escrow Agent shall be excused from all responsibilities, including insolvency of any depository, absolutely. The provisions of this Section shall survive the Closing or the earlier termination of this Agreement and may not be amended without the prior written consent of Escrow Agent.

10.20 **Acceptance of Deed**. The acceptance and recording of a deed to the Property by Buyer or its nominee as the case may be, shall be deemed to be a full performance and discharge of every agreement and obligation of Seller herein contained or expressed, except such as are, by the express terms hereof, to be performed after the delivery of said deed.

10.21 **Use of Funds at Closing**. To enable Seller to make conveyance as herein provided, Seller shall, at the Closing Date, use the purchase money or any portion thereof to clear the title of any or all Monetary Encumbrances, provided that all instruments so procured are recorded simultaneously with the delivery of said deed; provided, however, that discharges of mortgages granted by Seller to and held by institutional lenders may be obtained by counsel for Buyer or Buyer's lender, using funds deducted from the proceeds due to Seller, and recorded in the ordinary course of business following completion of the conveyance from Seller to Buyer.

10.22 **Assignability; Nominee**. Buyer shall not record this Agreement. Buyer may not assign its rights under this Agreement without the prior written consent of Seller provided, however, that Buyer shall have the right to designate a "nominee" (as hereinafter defined) to take title to the Premises by notice to Seller given not later than seven (7) days prior to the Closing Date; provided, however, that no such nomination shall release Buyer from any liability or obligation under this Agreement. Any entity in which any principals or affiliates of Buyer have operational control will be deemed a "nominee" for the purposes of this Agreement.

[SIGNATURE PAGE TO FOLLOW]

 CPS 4/22/19

IN WITNESS WHEREOF, this Agreement is executed by the parties on the dates set next to their signatures below, but shall be deemed dated for reference purposes as of the date first above written.

WITNESS:

BUYER:
BROCKWAY-SMITH COMPANY

By: Charles F. Smith
Its: President & CEO
Date signed: 4/22/19

WITNESS:

SELLER:
RAND ROAD HOLDINGS, LLC

Charles L Hildreth, Jr. President, DBE E-W, Inc., managing member of
By: Rand Road Holdings
Its: CHARLES L HILDRETH, JR
Date signed:
4/19/2019

CFS
4/22/19

EXHIBIT A

SITE DESCRIPTION

A certain lot or parcel of land with buildings thereon situated on the Westerly side of Rand Road in the City of Portland, County of Cumberland and State of Maine, being bounded and described as follows:

Beginning at the intersection of the Northwesterly sideline of Rand Road as conveyed to the State of Maine on December 20, 1969 and recorded in the Cumberland County Registry of Deeds in Book 3116, Page 772 and the Northeasterly sideline of Portland Terminal Company land:

Thence, by said railroad land on the following courses:

N-44°-56'-30"-W a distance of 248.26 feet;
N-44°-47'-10"-W a distance of 1217.20 feet;
N-44°-43'-30"-W a distance of 317.15 feet to a rod marking the Easterly line of land of the Maine Turnpike Authority.

Thence, by land of the Maine Turnpike Authority on the following courses:

N-34°-25'-00"-E a distance of 171.09 feet to a rod;
N-55°-35'-00"-W a distance of 50.00 feet to a rod;
N-34°-25'-00"-E a distance of 276.70 feet to a rod marking land now or formerly of Brighton Travellers Associates recorded in said Registry in Book 7354, Page 107;

Thence, by said Brighton Travellers Associates on the following courses:

S-44°-33'-30"-E a distance of 338.86 feet to a rod;
N-30°-43'-00"-E a distance of 329.26 feet to an iron marking the Southerly line of land now or formerly of Gordon F. Bloom, for the "Pine Tree Shopping Center."

Thence, by the Southerly line of said Pine Tree Shopping Center S-59°-21'-40"-E a distance of 1337.20 feet to the Westerly line of said Rand Road;

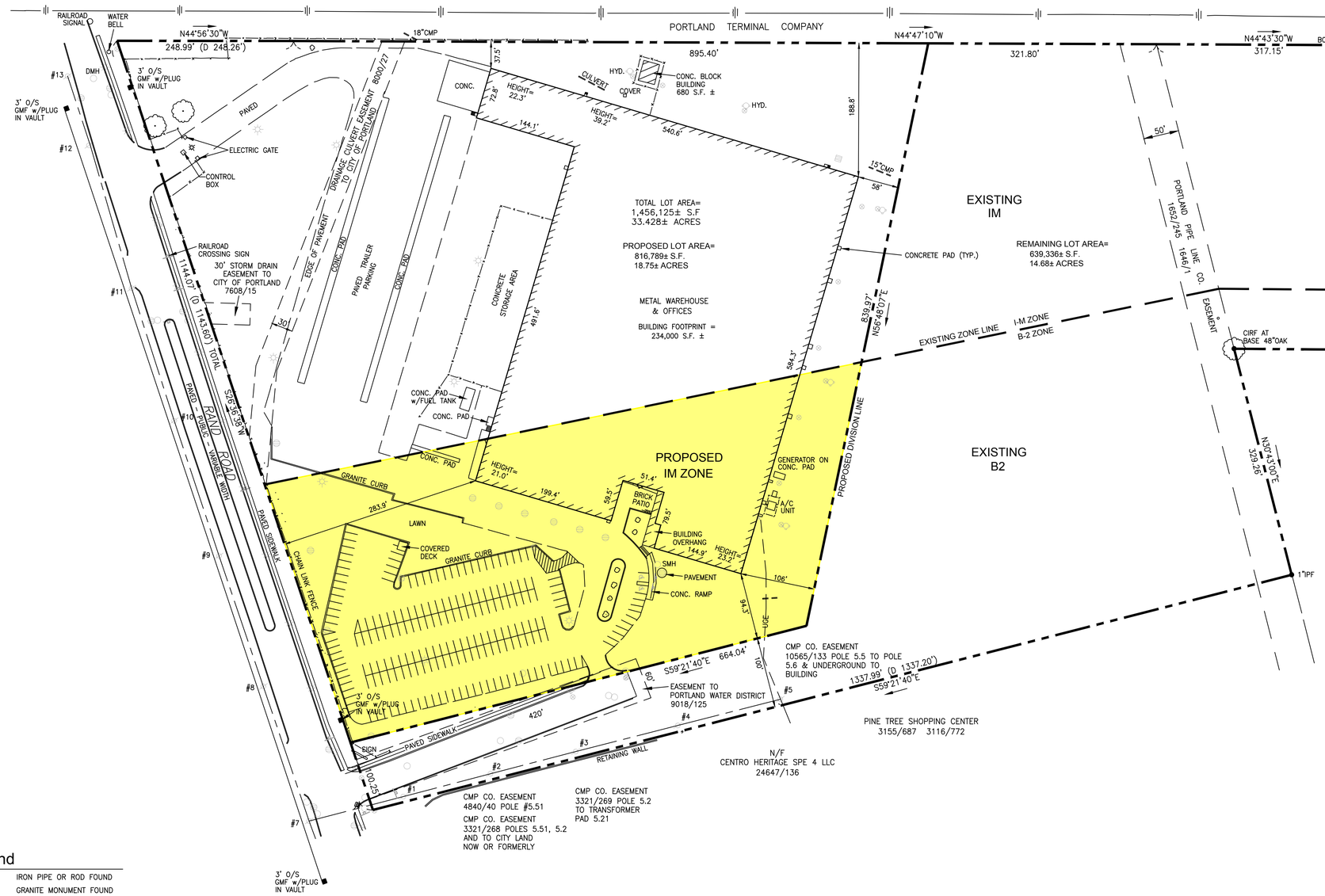
Thence, by the Westerly line of said Rand Road S-26°-37'-00"-W a distance of 1143.60 feet to the point of beginning.

Above courses are magnetic 1956.

Reference is made to a plan of the above-described property entitled "Land Title Survey on Rand Road, Portland, Maine for The Emery-Waterhouse Company, Rand Road, Portland, Maine 04103" made by Owen Haskell, Inc., dated May 11, 1993, Job No. 93038P, Bk. No. 640P.

 CFS 4/22/14

Att. E



Zoning Information (B2)

THE SURVEYED PARCEL IS LOCATED IN THE B2 (BUSINESS COMMUNITY) DISTRICT AND IM INDUSTRIAL ZONE AS SHOWN ON OFFICIAL ZONING MAP OF THE CITY OF PORTLAND. THE ZONING INFORMATION BELOW IS TAKEN FROM THE ZONING REPORT DATED JUNE 18, 2019, BY ZONING SOLUTIONS, INC. FOR THE B2 DISTRICT.

Minimum Lot Size	None
Minimum Street Frontage	20 feet
Front Yard Setback Minimum	None
Rear Yard Setback Minimum	10 feet, except as provided for below 5 feet for accessory structures
Side Yard Setback Minimum	None required, except as provided for below: 5 feet for accessory structures
Side Yard on Side Street Setback Minimum	None
Front Yard Maximum 1, 2	No more than 10 feet, except that the Planning Board or Planning Authority may approve a different amount for irregularly shaped lots or lots with frontage less than 40 feet provided this standard is met to the maximum extent practicable. 3
Structure Stepbacks	Portions of a structure above 35 feet shall be no closer than 5 feet from the side property line and no closer than 15 feet from the rear property line when such property line abuts a residential zone.
Height maximum	45 feet except as provided for below: a. 50 feet if first floor is partially or wholly occupied by a commercial use. b. 65 feet in B-2 and B-2c zones on lots >5 acres provided that all setbacks, except for front yard setbacks and side yard on side street setbacks, increase by 1 foot for each foot of height over 45 feet. c. 65 feet within 65 feet of Franklin St.
Maximum Impervious Surface Ratio	a. For residential uses: None b.For all other permitted uses: 80% in B-2 and B-2c c. For all other permitted uses: 90% in B2b
Minimum Lot Area per Dwelling Unit	a. Off-peninsula locations, as defined in section 14-47: 1,500 square feet, except as provided for in (b) below. b. On-peninsula locations (as per 14-47) and projects with active street frontages, as defined in section 14-188, below: 435 square feet.
Parking	For that part of every business, manufacturing, and industrial building not catering to retail trade and with floor area over three thousand (3,000) square feet: One (1) parking space for each one thousand (1,000) square feet of floor area, or major fraction thereof.

Zoning Information (IM)

IM INDUSTIAL ZONE

(a) Minimum lot size:
1. Correctional prerelease facilities: Ten thousand (10,000) square feet.
2. Other uses: None.

(a) Maximum impervious surface ratio: I-M and I-Ma zone: Seventy-five (75) percent. I-Mb zone: One hundred (100) percent.
City of Portland Land Use Code of Ordinances Chapter 14 Sec. 14-250
Rev.1-6-1997
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(b) Maximum building height: I-M and I-Mb zones: Seventy-five (75) feet. I-Ma zone: Forty-five (45) feet.

(c) Minimum side yards: Principal and accessory structures in the I-M and the I-Ma zone: Each structure shall be set back one (1) foot from each side property line for each one (1) foot of building height, up to twenty-five (25) feet, except that the minimum side yard shall be thirty-five (35) feet when the side property line abuts a residential zone. Principal and accessory structures in the I-Mb zone: None, except that the minimum side yard shall be twenty-five (25) feet when the side property line abuts a residential zone.

(d) Minimum rear yards: Principal and accessory structures in the I-M and I-Ma zone: Each structure shall be set back one (1) foot from the rear property line for each one (1) foot of building height, up to twenty-five (25) feet, except that the minimum rear yard shall be thirty-five (35) feet when the rear property line abuts a residential zone. Principal and accessory structures in the I-Mb zone: None, except that the minimum rear yard shall be twenty-five (25) feet when the rear property line abuts a residential zone.

(e) Minimum front yard: Principal and accessory structures in the I-M and I-Ma zone: Each structure shall be set back one (1) foot from the front property line for each one (1) foot of building height. Principal and accessory structures in the I-Mb zone: None.

(f) Minimum street frontage: Sixty (60) feet.

(h) Pavement setback from lot boundaries: Ten (10) feet.

Legend

- IRON PIPE OR ROD FOUND
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- (D) — DEED DIMENSION

SCALE : 1" = 80'

0' 40' 80' 160'

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5. "ALTA/NSPS LAND TITLE SURVEY, 7 RAND ROAD, PORTLAND, CUMBERLAND COUNTY, MAINE MADE FOR BROCKWAY-SMITH COMPANY" JUNE 14, 2019 REVISED JUNE 21, 2019 BY OWEN HASKELL, INC.

Utility Note

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. CALL 1-888-DIGSAFE AT LEAST THREE BUSINESS DAYS BEFORE PERFORMING ANY CONSTRUCTION. DUE TO OSHA CONFINED SPACE REQUIREMENTS, ALL INVERTS AND PIPE SIZES MUST BE VERIFIED PRIOR TO ANY CONSTRUCTION.

General Notes

1. OWNER OF RECORD: RAND ROAD HOLDINGS, LLC
   7 RAND ROAD, PORTLAND, ME
   TAX MAP: 264-A-5; 262-A-1;
   263-A-10 & 264-B-1
   C.C.R.D. BOOK 31342 PAGE 191

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3. THIS PLAN IS A COMPILATION OF PLAN REFERENCE 3 AND A FIELD INSPECTION IN MAY & JUNE 2019.

4. THERE ARE 203 PARKING SPACES, 2 OF WHICH ARE HANDICAPPED SPACES.

Certificate

OWEN HASKELL, INC. HEREBY CERTIFIES THAT THIS PLAN IS BASED ON, AND THE RESULT OF, AN ON THE GROUND FIELD SURVEY AND THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, IT CONFORMS TO THE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS CURRENT STANDARDS OF PRACTICE.

DATE

RANDY R. LOUBIER, PLS #2407

Plan of Proposed Zoning Amendment

7 Rand Road, Portland, Maine

Made for

Brockway-Smith Company

203 Read Street, Portland, Maine

OWEN HASKELL, INC.

PROFESSIONAL LAND SURVEYORS

390 US ROUTE 1, UNIT 10, FALMOUTH, ME 04105 TEL. 207-774-0424

DRAWN BY:	RS / JLW	DATE:	JAN. 29, 2020	JOB NO.	2019-094 P
CHECKED BY:	RRL	SCALE:	1" = 80'	DRWG. NO.	1-BND

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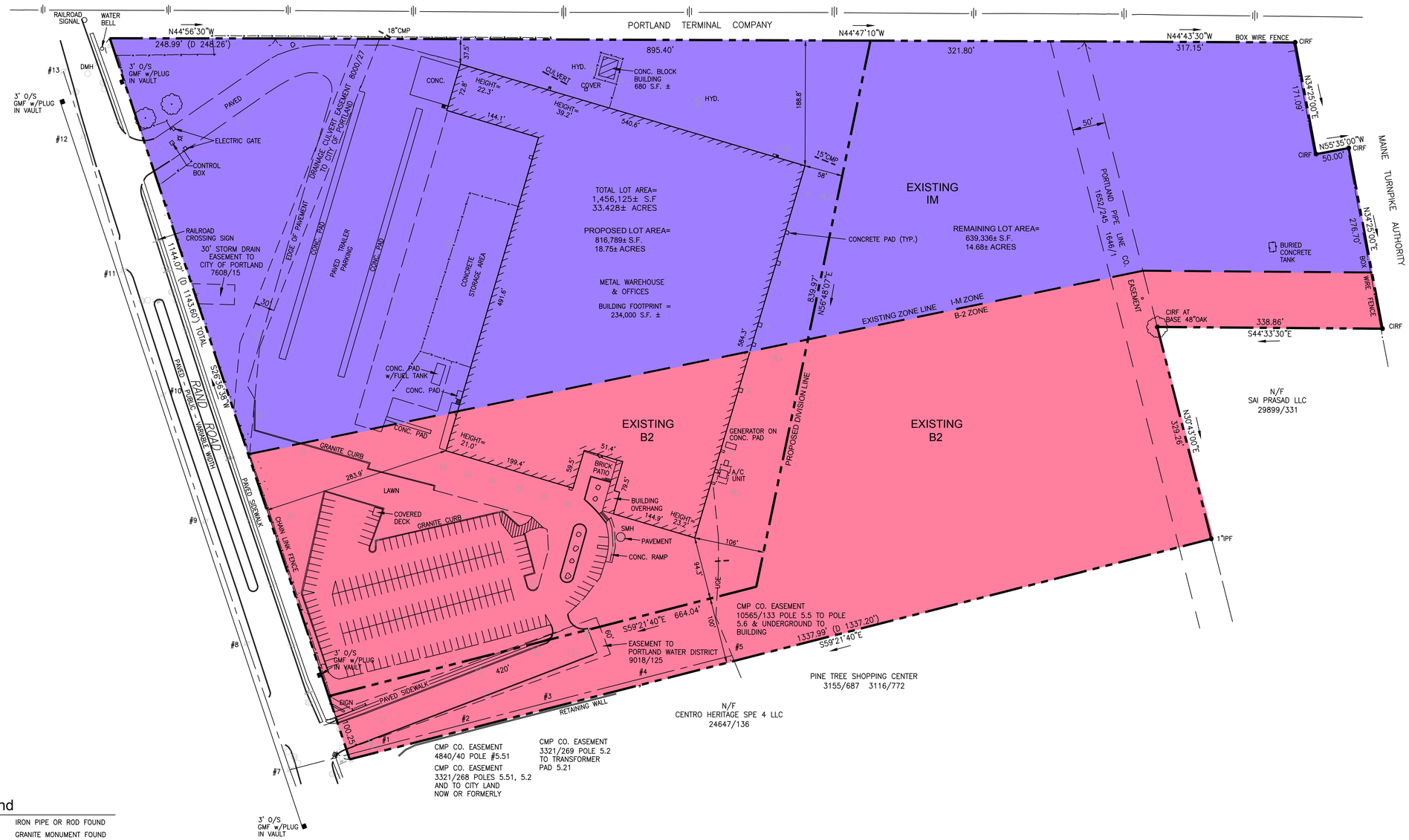

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Minimum Lot Size	None
Minimum Street Frontage	20 feet
Front Yard Setback Minimum	None
Rear Yard Setback Minimum	10 feet, except as provided for below 5 feet for accessory structures
Side Yard Setback Minimum	None required, except as provided for below: 5 feet for accessory structures
Side Yard on Side Street Setback Minimum	None
Front Yard Maximum 1, 2	No more than 10 feet, except that the Planning Board or Planning Authority may approve a different amount for irregularly shaped lots or lots with frontage less than 40 feet provided this standard is met to the maximum extent practicable. 3
Structure Stepbacks	Portions of a structure above 35 feet shall be no closer than 5 feet from the side property line and no closer than 15 feet from the rear property line when such property line abuts a residential zone.
Height maximum	45 feet except as provided for below: a. 50 feet if first floor is partially or wholly occupied by a commercial use. b. 65 feet in B-2 and B-2c zones on lots >5 acres provided that all setbacks, except for front yard setbacks and side yard on side street setbacks, increase by 1 foot for each foot of height over 45 feet. c. 65 feet within 65 feet of Franklin St.
Maximum Impervious Surface Ratio	a. For residential uses: None b.For all other permitted uses: 80% in B-2 and B-2c c. For all other permitted uses: 90% in B2b
Minimum Lot Area per Dwelling Unit	a. Off-peninsula locations, as defined in section 14-47: 1,500 square feet, except as provided for in (b) below. b. On-peninsula locations (as per 14-47) and projects with active street frontages, as defined in section 14-188, below: 435 square feet.
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IM INDUSTIAL ZONE
(a) Minimum lot size:
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RANDY R. LOUBIER, PLS #2407

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7 Rand Road, Portland, Maine

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203 Read Street, Portland, Maine

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DRAWN BY:	RS / JLW	DATE:	JAN. 29, 2020	JOB NO.	2019-094 P
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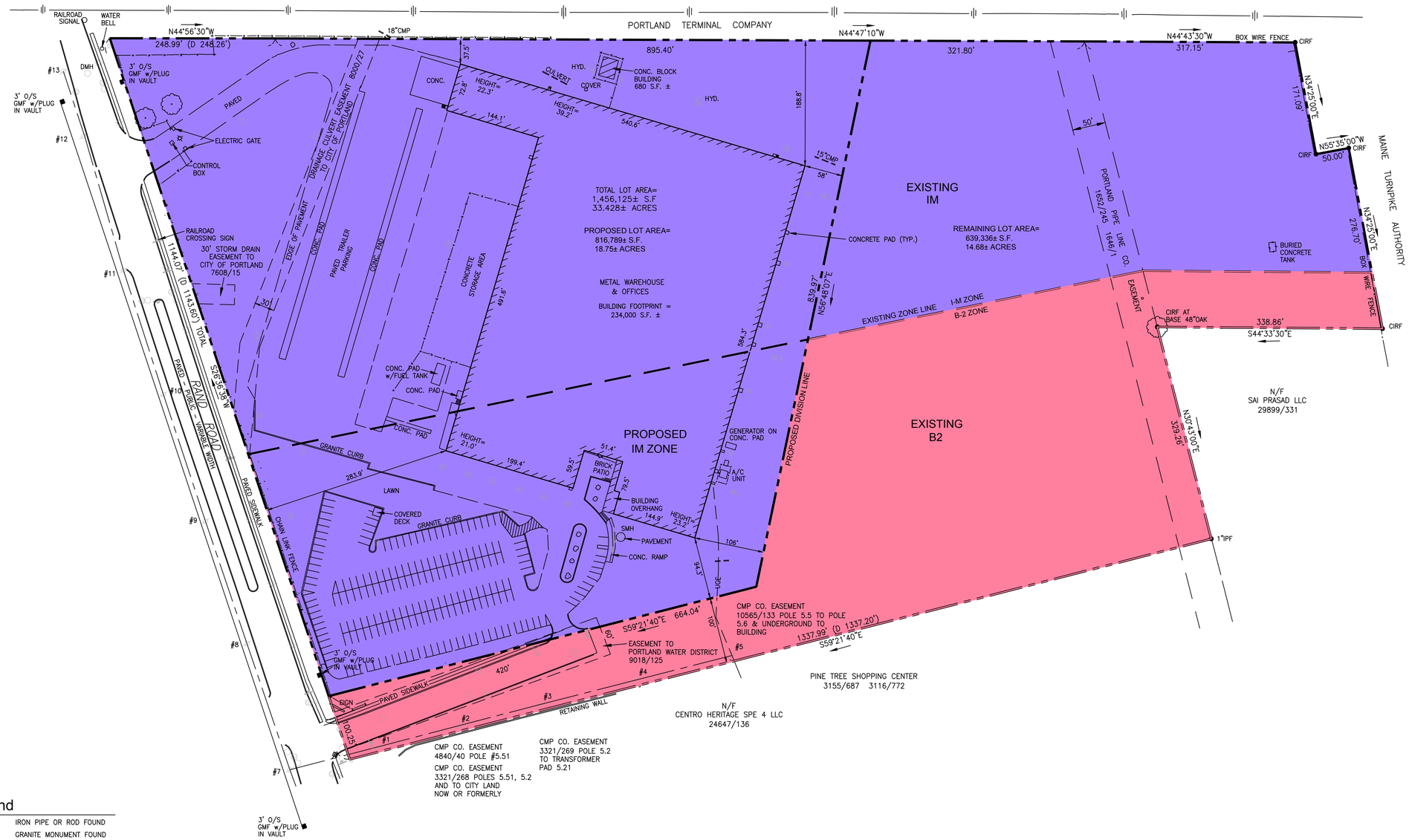

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4. THERE ARE 203 PARKING SPACES, 2 OF WHICH ARE HANDICAPPED SPACES.

Certificate

OWEN HASKELL, INC. HEREBY CERTIFIES THAT THIS PLAN IS BASED ON, AND THE RESULT OF, AN ON THE GROUND FIELD SURVEY AND THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, IT CONFORMS TO THE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS CURRENT STANDARDS OF PRACTICE.

DATE

RANDY R. LOUBIER, PLS #2407

Plan of Proposed Zoning Amendment

7 Rand Road, Portland, Maine

Made for

Brockway-Smith Company

203 Read Street, Portland, Maine

OWEN HASKELL, INC.
PROFESSIONAL LAND SURVEYORS
390 US ROUTE 1, UNIT 10, FALMOUTH, ME 04105 TEL. 207-774-0424

DRAWN BY:	RS / JLW	DATE:	JAN. 29, 2020	JOB NO.	2019-094 P
CHECKED BY:	RRL	SCALE:	1" = 80'	DRWG. NO.	2-PRO

PLANNING BOARD REPORT
PORTLAND, MAINE

Cold Storage Facility
40 West Commercial Street
Level III Site Plan and Site Location of Development Review
PL-001042-2020
Maine International Cold Storage Facility, LLC, Applicant

Submitted to: Portland Planning Board **Public Hearing Date:** 10/13/2020	**Prepared by:** Christian Roadman, Planner **Date Prepared:** 10/9/2020



Context of proposed project at 40 West Commercial Street (highlighted in teal)

I. INTRODUCTION / PROPOSED DEVELOPMENT

Maine International Cold Storage Facility, LLC seeks to build a 107,203 gross square foot cold storage facility on state-owned land located at 40 West Commercial Street. This large-scale refrigerated warehouse facility, which would be the only one of its kind in Portland, is intended to support marine-related and other intermodal commerce. While the height of the proposed facility varies (up to 75 feet, based on interior program and zoning restrictions) the entire building is proposed as one story.

The 17.9 acre development site is located adjacent to the International Marine Terminal (IMT) and proposes an interior connection to that site. A significant feature of the proposed site plan is its accommodation of trucks for loading and delivery. While this is central to the project's purpose, Department of Public Works staff note that the site driveway is unnecessarily wide (it is the source of a waiver request) and would ideally be reduced and modified.

The proposed project previously had two workshops with the Planning Board. The Planning Department advertised this Public Hearing with legal advertisements on October 2 and 3, and sent 83 notices to the owners of property within 500 feet of the property in question.



Rendering of proposed project at 40 West Commercial Street, in context viewed from the east (image: Applicant)

Applicant: Maine International Cold Storage Facility, LLC
Consultants: Woodard & Curran, Inc. (civil engineering); CWS Architects (building design)

II. REQUIRED REVIEWS

Waiver Requests	Applicable Standards
1. Retain existing driveway width of ~108 f.	Technical Manual Section 1.7.2.4: maximum driveway widths shall not exceed 30 ft. for industrial uses.
2. Nine non-standard parking spaces of 12 x 55 ft. (intended for trucks)	Technical Manual Section 1.14: parking space measurements of 9 x 18 ft.
3. Parking lot drive aisle width of ~116 ft.	Technical Manual Figure I-27: 24 ft. parking drive aisle width.
4. Exemption from south-side sidewalk along West Commercial Street. ($60,000 infrastructure contribution expected)	Land Use Code Sections 14-498, 14-526, 14-506: requiring sidewalks to be constructed on each side of each street
5. Exemption from stormwater flooding standard, because of discharge into tidally-influenced waterbody.	Technical Manual Section 5.III, 5.IV
Review	Applicable Standards
Site Plan	Section 14-526
Conditional Use (Cold Storage Facility)	Sections 14-320 and 14-474
Site Location of Development	Technical Manual Section 14

III. PROJECT DATA

Existing Zoning	Waterfront Port Development Zone
Existing Use	Industrial, Storage, Vacant
Proposed Use	Industrial, Cold Storage Facility
Property Size	779,724 sf.

	Existing	Proposed	Net Change
Building Footprint (sf.)	0	107,203	+107,203
Building Floor Area (sf.)	0	107,203	+107,203
Impervious Surface Area (sf.)	97,285	212,580	+115,295
Parking Spaces	0	24 standard, 9 truck spaces	+33
Bicycle Parking Spaces	0	6	+6

IV. EXISTING CONDITIONS

The property upon which the applicant proposes to develop the cold storage facility is a large state-owned site that sits within an industrial area along West Commercial Street. To the north of the site is the West End residential neighborhood, which sits on a bluff beyond West Commercial Street. According to the applicant (**attachment C**), the site, which is now mostly cleared, previously housed a natural gas / propane distribution facility. Abutting the site to the west is a boat repair and sale yard. On the same property, to the north as well as to the west of the proposed cold storage facility, are storage areas for shipping containers at the IMT. A railroad spur ends at the site.

The IMT is Maine's largest port and was rebuilt in 2010 by the State of Maine and the Maine Port Authority to support its continued growth and operations of which includes loading and unloading of cargo ships and storage of shipping containers. To date the state has invested upwards of approximately $20 million to expand the IMT and connect it with the National Rail System. The proposed cold storage facility is anticipated to be a symbiotically beneficial complement to the IMT, providing more efficient storage of shipped goods requiring refrigeration.

Following a public process that included the surrounding neighborhood, concerned residents, and stakeholders, the City Council adopted a rezoning of the area in 2017 to allow for additional height up to 75 feet for certain conditional uses to help ensure continued viability of the western waterfront. Although the proposed cold storage facility represents a change from the currently vacant and underutilized site that offers unobstructed views, the zoning requires sight lines between buildings, setbacks from Commercial Street, smaller building footprints, and maximum building lengths to mitigate concerns related to excessive building massing's. The property's southern length is entirely bounded by the Fore River.

The applicant describes the development site in their Site Location of Development report (**Attachment Z**):

"*The area of the 17.9-acre property where the Cold Storage Facility is proposed is currently vacant. There are remnant concrete slabs and pavements, site lights, transformer pads, railroad tracks, and gravels that will be removed. Other portions of the property, outside of the proposed Cold Storage Facility, are currently being used for various IMT operations. There is also a gas facility operated by Unitil located on the parcel.*" These existing conditions can be viewed on the site survey (**Attachment W**).

V. PUBLIC COMMENT AND NEIGHBORHOOD MEETING

The applicant held a remote neighborhood meeting on June 10, 2020, as attested in certification documents (**Attachment V**). According to the provided minutes, questions were asked and answered regarding potential noise from trucks and the facility, building height and capacity, environmental and health impacts of construction, proposed and potential future usage, landscaping, and other project-related specifics.

As of the writing of this report, the Planning Department received 26 public comments (**PC1 – PC28**) expressing concern about the project, specifically relating to its need / economic feasibility, the size of the proposed building, its impacts on views, traffic, pollution, noise, and its appropriateness per zoning, and questions about the particulars of the proposed cold storage use.

VI. RIGHT, TITLE, & INTEREST AND FINANCIAL & TECHNICAL CAPACITY

The applicant provided a deed of convenience evidencing the Maine Department of Transportation's ownership of the property in question, and an option to ground lease and subsequent extension (**Attachment E**) between the Maine Port Authority and Maine International Cold Storage Facility, LLC.

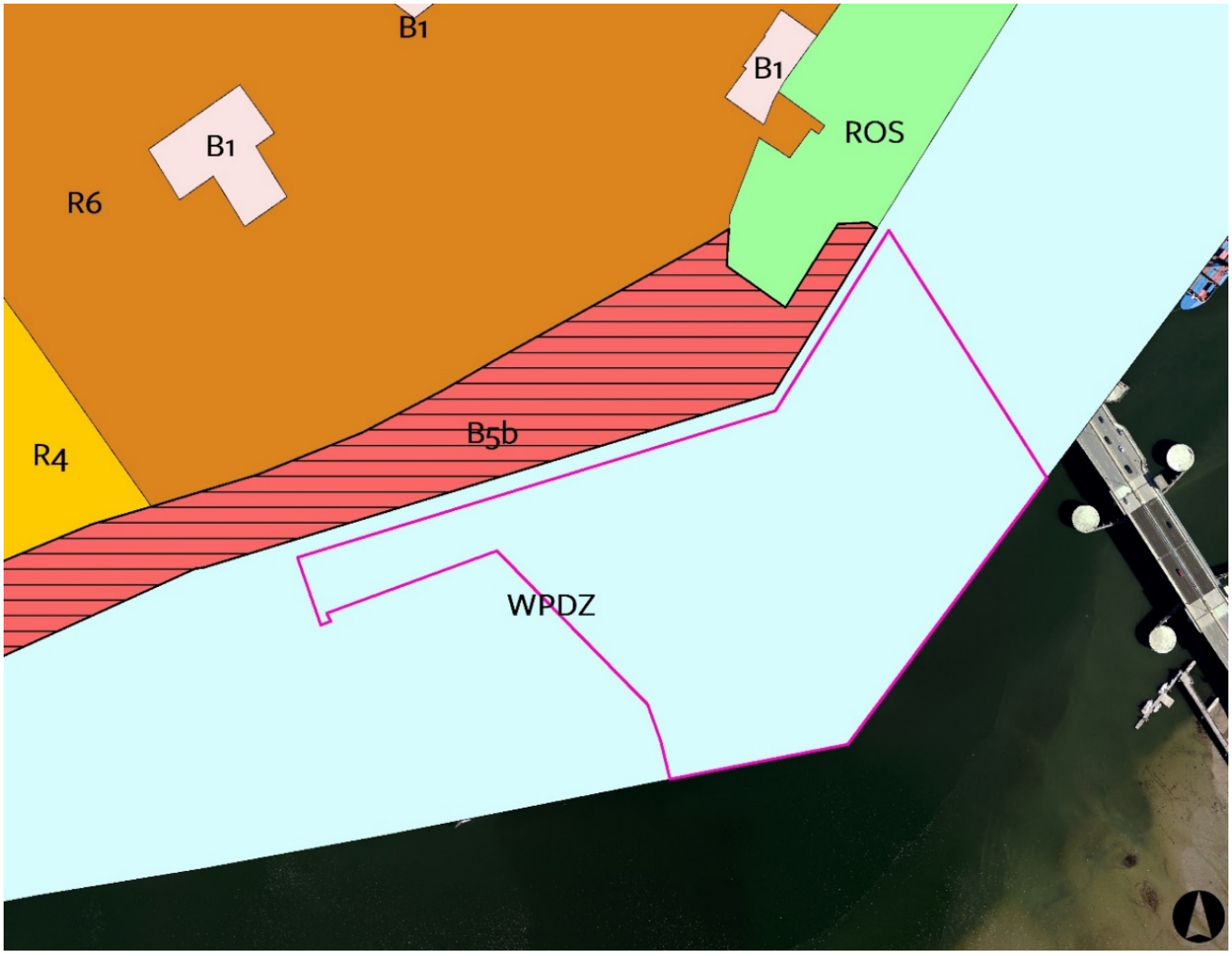
The applicant also provided a letter with holdings information (**Attachment J**) from Amber Infrastructure Group, a partner in the project, to evidence financial capacity to undertake the project.

The applicant cited consultant experience and expertise as evidence of technical capacity.

VII. ZONING ANALYSIS

The subject property is within the Waterfront Port Development Zone (WPDZ). A cold storage facility is a conditional use in this zone. Please note that in the WPDZ, conditional uses have a particular set of dimensional requirements:

	Required	Proposed
Lot Size (sf/ac)	5 acres	17.9 acres
Minimum Street Frontage (ft.)	None	~1,600
Front Yard Minimum (ft.)	None	151
Front Yard Maximum (ft.)	None	151
Rear Yard (ft.)	None	210
Side Yard (ft.)	None	44
Maximum Height (ft)	75	~74
Maximum Lot Coverage (%)	50%	14%
Off-Street Parking	Determined by Planning Board	33
90' View Corridor	One	Delineated on site plan (discussed below)



Zoning context of proposed project at 40 West Commercial Street (highlighted in pink)

The City's Zoning Administrator participated in the review of the proposed project (**Attachment 1**), which meets the required dimensional criteria as proposed. However, the applicant must submit a letter from the Federal Aviation Administration confirming that the project will not exceed height limits for nearby runways or create a hazard to navigable airspace. **Submission of this confirmation is suggested as a condition of approval prior to issuance of a building permit**. Additionally, the applicant will need to submit a flood hazard development permit as part of any

building permit application.

The applicant submitted a conditional use application, as well as narratives regarding zone-specific conditional use and dimensional standards (**Attachment U**) in advance of a public hearing. Staff assessments are provided below, as well as the WPDZ's purpose statement (emphasis added).

WPDZ Purpose Statement

"Transport of goods by water to and from Portland is an important component of both the local and regional economy. *This commerce is dependent upon land with direct access to the dredged deep-water channel of the Fore River and Portland Harbor*."

"The Port of Portland is integral to the city's economic, cultural and fiscal health. *This zone exists to ensure the continued viability of the Port of Portland*. Uses in the port development zone, while governed by the similar performance standards as other industrial zones, are primarily limited to those uses which are dependent upon deep water and which contribute to port activity."

"Nonmarine activity may be allowed to the extent it will not have any adverse impact on marine uses."

Sec 14-230: Standards for Conditional Uses in the WPDZ

- *Not impede or preclude existing or potential water-dependent development on other lots*
- *Be compatible with water dependent and marine uses*
- *Operationally support one or more water dependent use(s), or be located in a building or structure that is physically adaptable or relocatable to make way for future development of water-dependent uses*
    - The proposed project is intended to supplement and support water-dependent functions at the IMT. It does not preclude water-dependent uses elsewhere on the Maine state / IMT property or at neighboring properties, and introduces efficiencies to benefit the IMT and its clients.

- *Allow for adequate access to the water*
    - Staff Response: Staff understand this conditional language, as supported by the purpose statement quoted above, to prohibit uses which would negatively impact use of the Fore River and Portland Harbor for marine-related commerce. As noted directly above, the proposed project supports marine-related commerce via infrastructural support for water-based-shipping. The project is located on an existing, previously developed (though now vacant) industrial site bound by other development.

- *Meet any additional performance and dimensional standards set forth [in sections 14-320.2 and 14.320.3]*
    - Staff Response: The project conforms to dimensional standards. The applicant describes conformance to the zone's performance standards, such as noise and vibration standards, in a document submitted with their application (**Attachment K**).

      One of the zone's relevant dimensional standards is the following: "for each lot, at least one view corridor of at least ninety (90) feet in width shall be left unbuilt to preserve a clear line of site between West Commercial Street and the water." This standard was the source of some discussion at the proposed project's last Planning Board workshop, as the proposal maintains fencing at the property line and includes interior fencing for controlling vehicle movement.

      The applicant delineated on their site plan (**attachment 3**) a view corridor that does not include buildings. Staff believe this to meet the intention of the standard, as no buildings are proposed in the corridor, and . staff do not interpret this standard to prohibit visually permeable fencing and landscaping.

Section 14-474: Standards for Conditional Uses Generally

- *The volume and type of vehicle traffic to be generated, hours of operation, expanse of pavement, and the number of parking spaces required are not substantially greater than would normally occur at surrounding uses or other allowable uses in the same zone*
    - Staff Response: The proposed project is industrial and marine related in nature, and located adjacent to shipping and marine-related businesses, including the IMT (a site with significant activity). The zone permits as of right, or allows conditionally, a variety of marine and industrial uses.

- *The proposed use will not create unsanitary or harmful conditions by reason of noise, glare, dust, sewage disposal, emissions to the air, odor, lighting, or litter*

  Staff Response: The project is not expected to produce unsanitary or harmful conditions. Please see the applicant's response to conditional use standards (**attachment U**).

- *The design and operation of the proposed use, including but not limited to landscaping, screening, signs, loading, deliveries, trash or waste generation, arrangement of structures, and materials storage will not have a substantially greater effect / impact on surrounding properties than those associated with surrounding uses or other allowable uses in the zone.*
    - Staff Response: The project is being reviewed under the City's site plan standards, which speak to and regulate details related to these potential impacts. The City's consulting traffic engineer and Staff from the Department of Public works were involved in the project's review, and their relevant comments (**attachments 2 and 3**) are described below.



Rendering of the proposed project in context viewed from the south (image: applicant)

VIII. DEVELOPMENT REVIEW

A. SITE PLAN STANDARDS (Section 14-526)

Staff reviewed the proposed development for conformance with the relevant review standards of Portland's site

plan ordinance and applicable regulations, and staff comments relative to each standard are below:

a) Transportation Standards

Impact on Surrounding Street Systems and Access and Circulation; Access and Circulation; Public Transit Access; Parking; Transportation Demand Management

The proposed project is located at a challenging and congested intersection of the City. The immediate impacts of the proposed project are fairly limited due to a small number of employees and the specificity of the site's use, but come in the context of broader operations at the International Marine Terminal.

The City's consulting traffic engineer reviewed a traffic study provided by the applicant (**Attachment R**) and provided review comments (**Attachment 2**). A Traffic Movement Permit is not required of this project. The consulting traffic engineer noted that "the level of traffic [to be produced by the project] would not be expected to have a significant impact on the area roadway system." However, as the project was anticipated to produce 24 morning peak hour truck trips, they suggested that the applicant's transportation demand management program include a program to spread this anticipated truck traffic further into non-peak hours. The applicant since provided a supplemental TDM update memo (**Attachment Y**) reducing the number of scheduled AM peak hour trips to 18. Approximately 12 truck trips are anticipated during the PM peak hour.

The Department of Public Works suggested that the applicant install traffic-management devices to the West Commercial Street, Beach Street, and site driveway intersection: an adaptive traffic control device with advance radar detection and a "blank out" sign mandating turn restrictions in the presence of bicyclists and pedestrians. **These installations, along with a $60,000 contribution towards City shared-use paths** (as the applicant is not providing sidewalk along project frontage on the south side of West Commercial Street) **are suggested as conditions of approval.** These are intended to smooth traffic flow and promote pedestrian and bicyclist safety.

In response to previous staff and board feedback, the applicant reduced the proposed employee parking area by six spaces, committed to providing employee bus passes if requested, and reduced the proposed truck parking area by three spaces. The applicant also introduced a notch to the proposed pavement / truck movements area to reduce impervious surface.

The Department of Public Works senior engineer (**Attachment 3**) continues to encourage reduction to the project's driveway width and changes to peripheral driveway materials. Width reductions would reduce impervious surfaces and encourage slower turning speeds. Material changes from striped pavement to scored pavement or another surface could also encourage safer vehicle movements and speeds.



Intersection of West Commercial Street, Beach Street, and the project's site driveway. North is rightward in this image.

b) Environmental Quality Standards

Preservation of Significant Natural Features; Landscaping & Landscape Preservation; Water Quality, Storm Water Management and Erosion Control

The project was reviewed for conformance with relevant stormwater, water quality, and erosion control regulations by a third party civil engineer (**Attachment 4**). A stormwater BMP maintenance agreement must be provided for review by the City (this is a standard condition of approval). The applicant requested a waiver from the City / DEP stormwater flooding standard, because the project conveys flows to a tidally influenced waterbody. Per the peer reviewer, this waiver is appropriate.

As the applicant altered their site plan to reflect feedback, the stormwater calculations previously reviewed became out of date. However, as several of these revisions reduced impervious surface, potential capacity and treatment of the proposed stormwater management systems is not a concern. Therefore, **final stormwater calculations are suggested as a condition of approval prior to application for a building permit.**

Per DPW review (**Attachment 3**) the applicant must provide a dewatering plan to prevent potentially contaminated groundwater from entering the City's stormwater system or Casco Bay untreated. As any such plan would be developed by a contractor as part of construction-related documents, **this is suggested as a condition of approval prior to application for a building permit.**

The project is located on a group of large parcels, and its street frontage could be calculated in multiple ways. However, site flexibility within 20 ft. of the City's right of way is limited. Under one calculation of applicable frontage, the project would be expected to provide street trees or a contribution to the street tree fund for approximately 375 feet of frontage, with trees required at 45 feet on center. This would require provision of 8 street trees per the definition within the City's technical manual, acceptable alternatives, or payment of $3,200 into the City's street tree fund ($400 x 8). **Payment into the City's tree fund is suggested as a condition of approval prior to issuance of a certificate of occupancy**.

Per Board feedback, the applicant increased the number of trees in their landscape plan, especially as viewed from the water. The applicant since raised the possibility of limiting tree planting to allow for better view of a proposed line-work mural (addressed additionally below). Staff, and the City arborist, do not feel that such a reduction is warranted. In the short term (5-10 years) plantings are not expected to significantly obscure a mural. In the long term (25 years) fully-leafed trees will obscure the mural, but will mitigate against fading or potential lapses in mural upkeep.

c) Public Infrastructure and Community Safety Standards

A City life safety professional participated in the project's review (**Attachment 5**), requiring placement of an additional fire hydrant and spacing information regarding proposed photovoltaic panels on the cold storage building's roof. The applicant subsequently addressed these comments to the reviewer's satisfaction.

The applicant must provide an ability to serve letter from the Portland Water District. **This is suggested as a condition of approval prior to application for a building permit**. The Department of Public Works has confirmed the availability of adequate sewer capacity (**Attachment O**).

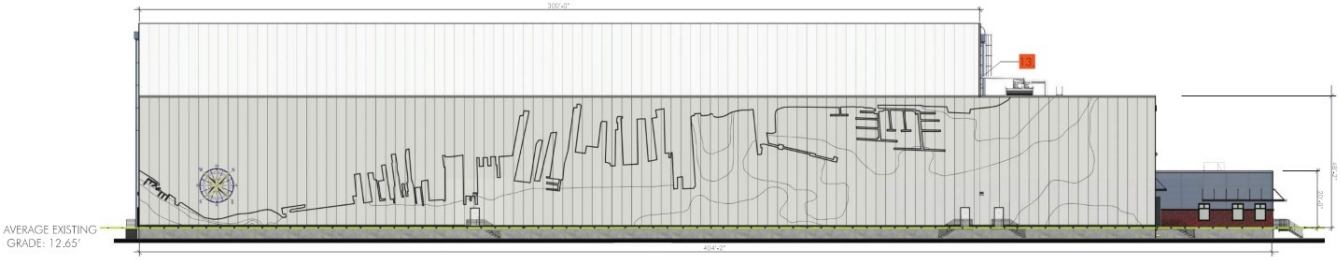
d) Site Design Standards

1. Massing, Ventilation and Wind Impact; Shadows; Snow and Ice Loading; View Corridors; Historic Resources; Exterior Lighting; Noise and Vibration; Signage and Wayfinding

   Planning staff reviewed the project's photometric plan and lighting cutsheets (**Attachment D**), and consider them acceptable.

2. Zoning Related Design Standards
   The City's Urban Designer reviewed the project (**Attachment 6**), noting that they find the project meets the zone-related design standards, which generally dealt with differentiation of building elements and preventing large uninterrupted mass. Facing landward, the project presents varied heights and materials.

   From the water view, the building originally presented as fairly blank and simple. In response to Board feedback, the applicant now proposes a black line work mural representing the area waterfront. Staff support this mural approach.



South elevation of the proposed project, featuring a black line work mural depicting the area waterfront (image: applicant)

B. COMPREHENSIVE PLAN

Portland's Plan 2030 identifies a vision statement, policy goals for the City, and principles of future land use. Future Land Use, the Vision Statement, several Policy Guide sections reinforce the respective needs of each section of the waterfront, samples of which are included below. The applicant also provided their own analysis of consistency with the comprehensive plan (**Attachment M**).

Vision statement:

- Sustainable*:*

  "Portland has been built and rebuilt to endure; we will balance our historic fabric, sound infrastructure, and the best of new technology and design for the future."

- Secure:

  "We will strive to create a resilient economy through innovation, investment, and commitment to diversity."

- Authentic:

  "We will support our working waterfront as a commitment to maintaining a vibrant maritime economy in the 21st century."

Policy goals:

- Environment:

  "*Support agricultural, forest, and scenic resources appropriate to our urban context."*

  "Adopt sustainable land use and transportation policies that support connectivity, walkable neighborhoods, and multi-modal transportation."

- Historic Resources:

  "*Stabilize and enhance historic areas of the city by ensuring quality investment in existing structures and compatible infill development."*

  "Ensure an appropriate balance of continuity and change as Portland grows and evolves."

- Waterfront:
  The Waterfront Policy chapter supports the distinct roles of the Eastern, Central, and Western Waterfronts and of preserving port capabilities, and recognizes the unique regulatory framework that allows for both water dependent and non-marine uses along Portland's waterfront. It also includes the following strategies:

  "*Prioritize and promote Portland's unique mix of water-dependent, marine-related uses and compatible non-marine uses."*

  "Maintain and modernize infrastructure to support the working waterfront and port capabilities."

  "Ensure the future of the marine economy through support for emerging marine industries and mitigation of market trends that could compromise the balance between marine industries and competing development."

  "Recognize and reinforce waterborne transport of goods and people as foundational to our community."

  "Develop effective public and private partnerships to promote the Port of Portland as an economic engine for the State of Maine."

C. SITE LOCATION OF DEVELOPMENT

The City of Portland has delegated review authority from the Maine DEP for large projects that trigger Site Location of Development Act (SLODA) review. The standards for this review include the items below, which largely dovetail with Portland's existing site plan review standards:

- *Financial & Technical Capacity*: see section V, above.
- *Traffic Movement*: see site plan standards, a, above.
- *No Adverse Effect on the Natural Environment, Ground Water, Flooding, Storm Water Management & Erosion and Sedimentation Control*: see site plan standards, b, above.
- *Soil Types:* The applicant provided a draft geotechnical report and information regarding strategies to appropriately stabilize the building (**Attachment N**).
- *Infrastructure*: see site plan standards, c, above.



Rendering of the proposed project from the north, in context at Beech St. at Commercial Street (image: applicant)

IX. PROPOSED MOTIONS

A. WAIVERS

On the basis of the application, plans, reports and other information submitted by the applicant, findings and recommendations contained in the Planning Board report for the public hearing on October 13, 2020 for application PL-001042-2020 relevant to Portland's technical and design standards and other regulations; and the testimony presented at the Planning Board hearing:

1. The Planning Board **[finds / does not find]** based upon the submitted materials, that extraordinary conditions exist or undue hardship may result from strict compliance with the Technical Manual standard (Section 1.7.2.4) which requires that driveways for industrial properties shall not exceed a width of 30 feet. The Planning Board **[waives / does not waive]** the Technical Manual standard (Section 1.7.2.4) to allow retention of a non-compliant 113 foot wide driveway.

2. The Planning Board **[finds / does not find]**, based upon the Department of Public Works Senior Engineer's review, that extraordinary conditions exist or undue hardship may result from strict compliance with the Technical Manual standard (Section 1.14) which establishes a standard parking space dimension of 9 by 18 feet. The Planning Board **[waives / does not waive]** the Technical Manual standard (Section 1.14) to allow nine truck parking spaces with dimensions of 12 by 55 feet.

3. The Planning Board **[finds / does not find]**, based upon the Department of Public Works Senior Engineer's review, that extraordinary conditions exist or undue hardship may result from strict compliance with the Technical Manual standard (Section 1.14) which establishes a maximum drive aisled width of 24 feet. The Planning Board **[waives / does not waive]** the Technical Manual standard (Section 1.14) to allow a drive aisle width of 116 feet.

4. The Planning Board [**finds / does not find]**, based upon the submitted materials, that extraordinary conditions exist or undue hardship may result from strict compliance with Land Use Code Sections 14-498, 14-526, and 14-506 requiring sidewalks to be constructed on each side of each street. The Planning Board [**waives / does not waive]** these standards (Land Use Code Sections 14-498, 14-526, and 14-506) to exempt the applicant from provision of south-side sidewalk along West Commercial Street.

5. The Planning Board **[finds / does not find]**, based upon the consulting civil engineer's review, that extraordinary conditions exist or undue hardship may result from strict compliance with the Technical Manual standard (Sections 5.III and 5.IV) which limits quantities of water that may be discharged offsite. The Planning Board **[waives / does not waive]** the Technical Manual standards (Section 5.III and 5.IV) to exempt the project from the stormwater flooding standard because of discharge into a tidally-influenced waterbody.

B. SITE PLAN REVIEW & SITE LOCATION OF DEVELOPMENT

On the basis of the application, plans, reports, and other information submitted by the applicant; findings and recommendations contained in the Planning Board report for the public hearing on October 13, 2020 for application PL-001042-2020 relevant to the site plan and Site Location of Development Act regulations; and the testimony presented at the Planning Board hearing, the Planning Board finds that the plan **[is / is not]** in conformance with the site plan standards of the land use code and the Site Location of Development Act standards, subject to the following conditions of approval:

PRIOR TO APPLYING FOR A BUILDING PERMIT

1. The applicant shall submit a letter from the Federal Aviation Administration confirming that the project will not exceed height limits for nearby runways or create a hazard to navigable airspace, for review and approval by the Planning Authority.

2. The applicant shall submit an ability to serve letter from the Portland Water District.

3. The applicant shall submit a dewatering plan for review and approval by the Department of Public Works.

4. The applicant shall submit a final stormwater management plan, including updated stormwater calculations, for review and approval by the City's reviewing civil engineer and the Planning Authority.

PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY

5. The following infrastructure improvements shall be completed by the applicant to the satisfaction of the Department of Public Works:

    a. A blank out sign shall be mounted on the pedestrian pole on the northeast corner of Beach Street and West Commercial Street. It shall be active when the permissive left-turn phase is operating for eastbound Beach Street traffic and either a bike is detected headed westerly or the pedestrian crossing phase of Beach Street is activated. The sign shall display "Yield to Bikes and Pedestrians" or the most feasible equivalent.
    b. Two (2) FLIR TrafiRadar devices shall be installed and incorporated into signal operations for both Commercial Street approaches.
    c. A Surtrac adaptive control system shall be installed and implemented at this intersection.

6. The applicant shall provide the City with a $60,000 contribution towards the West Commercial Street shared-use path.

7. The applicant shall pay $3,200 ($400 per tree for each of the eight street trees not provided in accordance with the City's Technical Manual) into the City's street tree fund.

C. CONDITIONAL USE: COLD STORAGE FACILITY

On the basis of the application, plans, reports and other information submitted by the applicant; findings and recommendations contained in the Planning Board Report for the public hearing on October 13, 2020 for application PL-001042-2020 relevant to the Conditional Use standards as listed under Division 28 Section 14-474, Conditional Uses, and Division 18.5 Section 14-320, and the testimony presented at the Planning Board hearing, the Planning Board finds the proposed conditional use for a Cold Storage Facility [**does / does not**] meet the standards of Sections 14-

474 and 14-320.

XI. ATTACHMENTS

Report Attachments

1. Zoning Administrator Comments
2. Consulting Traffic Engineer Comments
3. DPW Senior Engineer Comments
4. Consulting Civil Engineer Memo
5. Life Safety Reviewer Comments
6. Urban Designer Review Comments
7. Transportation Systems Engineer Required Conditions

Public Comment

PC1 to PC 28.

Applicant's Submittals

A. Application Cover & Table of Contents
B. Application Fees & Checklist
C. Cover Letter & Project Description
D. Site Lighting Submissions
E. Evidence of Right, Title, & Interest
F. Easements & Other Burdens
G. Waiver Table
H. Evidence of State and or Federal Approvals
I. Assessment of Zoning
J. Evidence of Financial & Technical Capacity
K. Design Standards Narratives
L. Vehicle Turning Movement Figures
M. Comprehensive Plan Consistency Analysis
N. Draft Geotechnical Report
O. Availability & Adequacy of Public Utilities
P. Summary of Fire Codes
Q. Stormwater Management Report
R. Traffic Study & Trip Generation Analysis Memo
S. Flood Hazard Development Application
T. Response to Comments Letters
U. Supplemental Application Materials & Conditional Use Standards
V. Neighborhood Meeting Certification Materials
W. Boundary Survey
X. Solar Information
Y. Transportation Demand Management Memo
Z. SLOD Report

Plans

P1. Cover Sheet & General Notes
P2. Demolition
P3. Site Plan
P4. Civil Details
P5. Grading & Drainage
P6. Utility Plan
P7. Landscape Plan & Details
P8. Construction Management
P9. Floor Plan & Area Floor Plan
P10. Elevations
P11. Renderings & Perspectives

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

40 West Commercial ST

Ann Machado <amachado@portlandmaine.gov> Wed, Aug 12, 2020 at 8:59 AM
To: Christian Roadman <croadman@portlandmaine.gov>

I'm satisfied with the height of the pipe (top of penetration) being at 57 '.

With the floodplain permits, I just noticed that they only submitted the Minor Flood Hazard Permit. They also need to submit the Flood Hazard Development Application. They can wait to submit this as well as what they have already provided as part of the building permit application since they need to submit an elevation certificate.

Ann

Ann Machado
Zoning Administrator
Permitting and Inspections Department
City of Portland, Maine
(207) 874-8709
amachado@portlandmaine.gov

[Quoted text hidden]

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

40 West Commercial Street - Final Traffic Comments

Tom Errico <thomas.errico@tylin.com> Wed, Oct 7, 2020 at 3:37 PM
To: Christian Roadman <croadman@portlandmaine.gov>

Hi Christian – the following presents final traffic comments for the project as a status update from previous comments.

- I find the contents and methodologies provided to be acceptable.
  - **I have no further comment.**

- Based upon the trip generation estimate for the project, a Traffic Movement Permit is not required. The project is estimated to generate 39 AM peak hour trips and 22 PM peak hour trips. Of these totals, there will be 24 trucks during the AM peak hour and 7 trucks during the PM peak hour. Based upon this trip level the focus of the traffic study was at the West Commercial Street/Beach Street/Site Drive intersection. I would note that most if not all truck trips will arrive and depart towards the west and I-295. The remaining trips (15 AM trips and 15 PM trips) are a function of employee origins/destinations and will route similar to existing commuting patterns. This level of traffic would not be expected to have a significant impact on the area roadway system.
  - **I have no further comment.**

- The study documents long delays and poor levels of service at the West Commercial Street/Beach Street/Site Drive intersection. Given limitations on expanding capacity at this intersection, strategies to improve traffic operating efficiency are suggested. Accordingly, it is recommended that the applicant install a Surtrac adaptive traffic control device at the intersection with advance radar detection for the West Commercial Street approaches.
  - **Specific details for this recommendation have been provided by Jeremiah Bartlett. I have no further comment.**

- The West Commercial Street/Beach Street/Site Drive intersection is classified as a High Crash Location. The recently approved VA Clinic will be implementing improvements that would be expected to mitigate crashes. No further action is requested.
  - **I have no further comment.**

- To address potential safety conflicts between vehicles and pedestrians/bicyclists it is recommended that a blank out sign be mounted on the pedestrian pole on the northeast corner of Beach Street and West Commercial Street set to be active when the permissive left-turn phase is active for eastbound Beach Street traffic and either a bike is detected headed westerly or the pedestrian crossing phase of Beach Street is activated. The sign shall show Yield to Bikes and Pedestrians or the most feasible equivalent.
  - **Specific details for this recommendation have been provided by Jeremiah Bartlett. I have no further comment.**

- As noted above the project is expected to generate 24 truck trips during the AM peak hour. To minimize impacts to the commuter time-period, it is suggested that the TDM plan include a program such that morning truck arrivals are not concentrated during the peak period. It is my understanding truck arrivals will be scheduled and thus a system will be in place that can spread the impact of truck traffic.
  - **A TDM Plan has been provided but recommend that the above be incorporated into the Plan.**

If you have any questions, please contact me.

Best regards,

Thomas A. Errico, PE
Senior Associate
Traffic Engineering Director
TY LIN INTERNATIONAL
12 Northbrook Drive
Falmouth, ME 04105
+1.207.781.4721 main
+1.207.347.4354 direct
+1.207.400.0719 mobile
thomas.errico@tylin.com
Visit us online at www.tylin.com
Twitter | Facebook | LinkedIn | Instagram

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

40 West Commercial Street - Final comments before PB hearing

Mike Tremblay <mtremblay@portlandmaine.gov> Fri, Oct 9, 2020 at 1:48 PM
To: Christian Roadman <croadman@portlandmaine.gov>

Here are my final comments before Tuesday's Planning Board hearing for 40 West Commercial Street. Tom, I invoked your name in Comment 3, please let me and Christian know if you disagree with anything I said.

- DPW has asked that the Project be responsible for providing adaptive signal control at two locations, and blankout signs at West Commercial/Beach Street/Site Driveway, to address increased traffic along West Commercial Street. It is our understanding that the Applicant has committed to doing this, but should be confirmed prior to approval. These improvements shall be considered required by the site plan approval and shall not be considered a contribution in lieu of impact fees. These improvements will help to mitigate the Project's impact on traffic along West Commercial Street. The adaptive signals will also help to alleviate existing queuing issues, and the blankout signs will improve pedestrian and bicycle safety for users of the shared-use path.

- DPW and Planning has asked that the Applicant make an in-kind contribution for improvements to the shared use path along the north side of West Commercial Street, in lieu of building a sidewalk along the site frontage. Planning suggested a contribution of approximately $60,000. The Applicant's commitment to this contribution should be confirmed prior to approval. This sum shall not be considered a payment in lieu of impact fees.

- DPW, and the City's traffic consultant Tom Errico, do not believe that Project-related trips will contribute to any significant increase of traffic along Danforth Street or other West End neighborhood streets. Truck traffic associated with the project will be heavily concentrated on Commercial Street and West Commercial Street, arriving from Franklin Street or the Veterans Bridge; it would not be advantageous to use neighborhood streets to access the site. Due to the site's commitment to schedule arrival appointments, truck trips are expected throughout the day, and not concentrated during peak hours. That the project has relatively small peak hour impacts will make it less likely that more motorists currently using West Commercial Street will feel the need to find an alternate route.

- DPW continues to support any additional measures to reduce the site driveway width. The full proposed width is only required to allow two heavy vehicles to maneuver in/out of the site simultaneously. Management of traffic should eliminate this need and eliminate the need for an excessive driveway width within the site. Wide driveway widths add more pavement than necessary and encourage faster, less safe vehicle maneuvers by motorists driving smaller vehicles.

- DPW continues to support an alternate delineation material for the effective driveway width at the mouth of the driveway. The proposed paint will need to be maintained in perpetuity, and does little to force vehicles to make deliberate turns into and out of the site. An alternate material, such as scored concrete, would be less comfortable for passenger vehicles to drive on, and would encourage those motorists to make slower, more deliberate turns into and out of the site using the narrower asphalt section of driveway.

Thanks,
Mike

Mike Tremblay, P.E.
Senior Engineer
Engineering Division
Department of Public Works
City of Portland, ME
mtremblay@portlandmaine.gov
P. 207.874.8881 F. 207.874.8852

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WRIGHT-PIERCE
Engineering a Better Environment

MEMORANDUM

TO:	Christian Roadman, Planner	**DATE:**	10/6/2020
FROM:	Michael Guethle, PE	**PROJECT NO.:**	20308A
SUBJECT:	40 W Commercial Street – Level III Site Plan, PL-001042-2020		

Wright-Pierce has reviewed the initial Level III Site Plan Application information provided for the redevelopment at 40 W Commercial Street, as defined in the above subject line. The proposed project is located on a 7.4+/- acre site, part of the International Marine Terminal. The proposed project includes redevelopment of a former natural gas distribution facility with a Cold Storage Facility to support the International Marine Terminal (IMT) operations. Appurtenant portions of the site development include utility connections, stormwater management, parking, pedestrian access, and landscaping.

Documents Reviewed by Wright-Pierce:

- Level III Site Plan application, dated (most recent) September 29, 2020
- Engineering Permitting Plans, uploaded (most recent) September 29, 2020

Comments:

For stormwater treatment, Level III Site Plan applications with the City of Portland must submit a stormwater plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules. This includes conformance with the Basic, General, and Flooding Standards (Ref: Technical Manual, Section 5. II. Applicability in Portland. C. a.; and Ref: City of Portland Code of Ordinances Sec. 14-526. Site Plan Standards, (b). 3. b.)

1) Basic, General, and Flooding Standard:
    a. There were several details and comments on the General Standard that remain outstanding. The applicant has submitted a generally agreeable stormwater management plan, with some outstanding final details are subject to the final design of the building and parking lot layout. The application is presented with the

understanding that the stormwater management plan is not final, and these outstanding details will need approval.

b. As such, the reviewer would support a condition of approval that is contingent upon a complete Stormwater Management Plan, as well as a Stormwater Maintenance Agreement.

2) Utility Connections and Grading:

a. Grading and utility modifications were not identified in the updated submittals. As such, no additional comments are provided in this review for these items.

b. Ability to serve letters have not been provided for utilities impacted by the proposed project but have been requested by the applicant for applicable utilities. The applicant has indicated that ability to serve letters will be submitted to Planning upon receipt. This can be completed as a condition of approval if necessary.

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

40 West Commercial (Hydrant & Solar Spacing)

Jason Grant <jgrant@portlandmaine.gov> Mon, Jun 1, 2020 at 8:23 AM
To: Christian Roadman <croadman@portlandmaine.gov>

Christian,

The hydrant location looks good, For the solar panels I think that it's enough info for it to be approved at this point. It is hard to tell for sure that they are meeting all of the codes with this limited information but it appears they are putting in the required pathway so we can review the rest at the building permit phase. So Fire approves the changes.

Jason Grant CFI-2, CFPE
Life Safety CEO / Plan Reviewer
Permitting and Inspections Department
City of Portland
389 Congress Street Rm 315
Portland, Maine 04101
Phone:(207) 756-8187

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Planning and Urban Development Department
Planning Division

Subject: WPDZ Design Review – 40 West Commercial (Cold Storage)

Written by: Caitlin Cameron, Urban Designer

Date of Review: Wednesday, October 6 2020

The project at 40 West Commercial Street – Cold Storage Facility – was reviewed according to the adopted WPD Zone performance standards by Caitlin Cameron, Urban Designer and Christian Roadman, Planner.

Design Review Comments: *(questions and unmet standards in red)*

Sec. 14-320.3 Performance Standards

(k) Lighting – Applicant has provided a photometric plan, cut sheets, analysis. Minimal amount of building lighting is provided that would be visible from the residential neighborhoods. All fixtures appear to be full cut off, and mounted low on the building or under canopies so as not to produce glare for vessels or neighboring residential properties.

(l) Signs – Signs will come under separate permit application according to Sign Ordinance in Division 22.

(o) Design and Visual Character:

1) Long Views/Building Design: Change in roof form provides some visual interest to meet the standard. Rooftop mechanicals are placed on a lower portion of the building to reduce visibility from long views and are screened. PV panels and roof drainage systems have low profiles. Massing variation provides some variation and smaller scale to the overall form.

2) Massing: Massing emphasizes administrative uses with a smaller-scale, one-story portion of the building at the ROW interface that indicates the active portions of the building and street-facing entrances. A second change in massing occurs at the loading dock.

3) Façades – equal treatment: All facades include equal treatment of materials and openings. The roof form is somewhat varied. Materials are placed according to function and massing and break up the scale of the building from some perspectives. For functional reasons, two of the façades have no massing or material variation with minimal openings and no articulation other than stoops at the entrances. To address the design requirements, the applicant proposes a color change related to the massing change to visually break up the facades. In addition, a mural is proposed on the water-facing façade to provide visual interest. Staff support this approach in lieu of the ability to provide openings or massing variation. Landscape will also be used to create scale.

4) Facades – variation and articulation: Project provides some visual interest with varied roof line and massing, change in material texture, windows, canopies, roof drains. Two of the façades have no massing or material variation with minimal openings and no articulation other than stoops at the entrances, roof drains – a color change is proposed to address the standard along with a mural facing the water.

5) Scale and Articulation: Project meets articulation requirement with canopy, entrances, and fenestration. The building also includes massing variation/stepbacks at the street-facing façade.

Planning Board Considerations

- Does the change in color and mural sufficiently address the design standards regarding visual interest and equal treatment of facades for the two functional, water-facing elevations?

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

Cold Storage: Sidewalk Waiver, Infrastructure Contribution, and Intersection Improvements

Jeremiah Bartlett <jbartlett@portlandmaine.gov> Thu, Oct 1, 2020 at 11:40 AM
To: Mike Tremblay <mtremblay@portlandmaine.gov>
Cc: Christian Roadman <croadman@portlandmaine.gov>, Bruce Hyman <bhyman@portlandmaine.gov>, Darrin Stairs <DStairs@woodardcurran.com>, Jedd Steinglass <jsteinglass@woodardcurran.com>, Helen Donaldson <hcd@portlandmaine.gov>, Tom Errico <thomas.errico@tylin.com>

The following shall be completed at this location:

1.) A blank out sign shall be mounted on the pedestrian pole on the northeast corner of Beach Street and West Commercial Street. It shall be active when the permissive left-turn phase is operating for eastbound Beach Street traffic and either a bike is detected headed westerly or the pedestrian crossing phase of Beach Street is activated. The sign shall display "Yield to Bikes and Pedestrians" or the most feasible equivalent.
2.) Two (2) FLIR TrafiRadar devices shall be installed and incorporated into signal operations for both Commercial Street approaches.
3.) A Surtrac adaptive control system shall be installed and implemented at this intersection.

My suggestion would be for the Applicant to check in with Highway Tech in Lewiston for Items 1 and 2 and check in with Rapid Flow in Pittsburgh, PA for Item 3.

http://www.highwaytech.com/
https://www.rapidflowtech.com/surtrac

Thank you,
Jeremiah

Jeremiah J. Bartlett, PE, PTOE
Transportation Systems Engineer
Department of Public Works
212 Canco Road, Suite B
Portland, Maine 04103
jbartlett@portlandmaine.gov
(207) 874-8891

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MAINE INTERNATIONAL COLD STORAGE FACILITY

LEVEL III SITE PLAN

40 West Commercial Street
Portland, ME

41 Hutchins Drive
Portland, ME 04102
800-426-4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0232277.00
Maine International Cold Storage Facility LLC
March 13, 2020

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1. APPLICATION

A Level III Site Plan has been filed through the City of Portland Citizen Self Service and Eplan online system. The Level III Site Plan Checklist is attached.

1.1 APPLICATION FEES

The Application Fee will be paid by the Applicant online. It is our understanding that the application fee includes:

• Level III Site Plan Over 300,000 SF	$7,000
• Site Location of Development Permit	$3,500
TOTAL:	$10,500

1.2 ATTACHMENTS

- Level III Checklist

CITY OF PORTLAND
Planning & Urban Development Department

LEVEL II and LEVEL III SITE PLAN
GENERAL DOCUMENT AND DRAWINGS CHECKLIST
Please submit each document as a separate PDF file
Please confirm by electronically checking the boxes to the left

** PLEASE FILL OUT AND UPLOAD SEPARATELY THE ZONING TABLE AND WAIVER TABLE AS NOTED BELOW **

GENERAL APPLICATION DOCUMENTS	
Yes ☑ NA ☐	**Project Description** • Cover Letter with detailed project description
Yes ☑ NA ☐	**Completed Checklist – Level I: Site Alteration** (this document)
Yes ☑ NA ☐	**Right, Title and Interest** • Deeds, leases, or purchase and sales agreements
Yes ☑ NA ☐	**Evidence of State or Federal Approvals** • Permits or letters of non-jurisdiction, if applicable
Yes ☑ NA ☐	**Zoning Assessment** • Table listing required and proposed uses and dimensional standards Zoning Assessment Table
Yes ☑ NA ☐	**Existing and/or Proposed Easements or Covenants, applicable.** • Evidence of existing easements and any proposed easements
Yes ☑ NA ☐	**Waiver Requests** • Written request for waiver describing request and reason Waiver Table
Yes ☑ NA ☐	**Financial Capability** • Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
Yes ☑ NA ☐	**Technical Capability** • Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN
STANDARDS AND SUBMISSION CHECKLIST

Provide assessment of compliance with standards and include supplemental documentation, as applicable
Please Submit each document as a separate PDF file

TRANSPORTATION

Yes	NA	
☑	☐	**Transportation Analysis- Traffic Impact (14-526 (a) 1)** • Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts • Traffic Impact Study (Technical Manual, Section 1) if applicable
☑	☐	**Access and Circulation (14-526 (a) 2 a)** • Access and internal circulation, addressing ADA access • Access and egress impacts on traffic flows • Description and use of drive-up features, if applicable
☑	☐	**Loading and Servicing (14-526 (a) 2 b)** • Loading and servicing needs, route and travel way geometrics for deliveries • Turning templates for delivery vehicles, if applicable
☑	☐	**Sidewalks (14-526 (a) 2 c)** • Sidewalks and condition along street frontages and internal walkways • Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
☐	☑	**Public Transit (14-526 (a) 3), if applicable** • Existing available transit services • Proposed site plan design details, such as easement, pad base, and shelter
☑	☐	**Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c)** • Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements • Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
☑	☐	**Bicycle Parking (14-526 (a) 4 b)** • Address bicycle parking requirements and identify locations on-site • Construction details for bike racks (Technical Manual, Section 1)
☑	☐	**Snow Storage (14-526 (a) 4 d)** • Management plan for snow removal and locate snow storage areas on plan
☑	☐	**Traffic Demand Management (TDM) (14-526 (a) 5), if applicable** • Develop TDM with Trip Reduction Targets and Strategies

ENVIRONMENTAL AND LANDSCAPE FEATURES	
Yes NA ☑ ☐	**Preservation of Significant Natural Features (14-526 (b) 1), if applicable** • Trees, plants, habitats listed on State or Federal list of endangered or threatened • High and moderate value waterfowl and wading habitat • Aquifers on Casco Bay Islands • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental consultants, determinations from applicable state agencies
Yes NA ☑ ☐	**Landscaping and Landscape Preservation (14-526 (b) 2 a)** • Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) • Protection measures of existing vegetation during construction • Protection measures within Shoreland Zone, if applicable
Yes NA ☑ ☐	**Site Landscaping (14-526 (b) 2 b)** • Screening and buffering of service areas and between non-residential and residential uses • Planting plans with plant schedule and sizes (Technical Manual, Section 4)
Yes NA ☑ ☐	**Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable** • Landscaped islands within parking areas (Technical Manual, Section 4)
Yes NA ☑ ☐	**Street Trees (14-526 (b) 2 b iii)** • Existing Heritage or Feature Trees on site and measures to preserve • Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable
ENVIRONMENTAL AND STORMWATER	
Yes NA ☑ ☐	**Water Quality, Stormwater Management and Erosion Control (14-526 (b)3 a)** • Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable • Erosion control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable • Subsurface sanitary sewage disposal and groundwater protection

PUBLIC INFRASTRUCTURE AND SAFETY	
Yes NA ☑ ☐	**Consistency with City Master Plans (14-526 (c) 1)** • Identify consistency with master plans • Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes NA ☑ ☐	**Public Safety and Fire Prevention (14-526 (c))** • Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) • Emergency vehicle access • Address consistency with public safety standards (Technical Manual, Section 3) • Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
Yes NA ☑ ☐	**Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)** • Electrical services, including providing underground services • Identify existing and proposed connections for public utilities and required public utility upgrades • Sewer line connections are required, if there is a main within 200 feet • Proposed solid waste management facilities on-site and management for the site • Written evidence of the ability to serve from utility companies, as applicable
SITE DESIGN	
Yes NA ☑ ☐	**Massing, Ventilations and Wind Impact (14-526 (d) 1)** • Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable • Bulk, location or height impacts on adjoining structures • Identify and locate HVAC equipment and venting away from public spaces and residential properties • Identify screening and manufacturing specifications for noise, if applicable
Yes NA ☑ ☐	**Shadows (14-526 (d) 2), if applicable** • Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes NA ☑ ☐	**Snow and Ice Loading (14-526 (d) 3)** • Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes NA ☑ ☐	**View Corridors (14-526 (d) 4), if applicable** • Protection of designated view corridors (Portland Design Manual, Appen. 1)

Yes	NA	
☑	☐	**Historic Resources (14-526 (d) 5), if applicable** • Identify developments within Historic Districts or affecting Designated Landmarks • Certificate of Appropriateness or other evidence • Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required • Address preservation and documentation of Archaeological Resources
Yes	NA	
☑	☐	**Exterior Lighting (14-526 (d) 6)** • Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) • Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
Yes	NA	
☑	☐	**Noise and Vibration (14-526 (d) 7)** • Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
Yes	NA	
☑	☐	**Signage and Wayfinding (14-526 (d) 8), if applicable** • Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff • Proposed commercial and directional signage on site
Yes	NA	
☑	☐	**Zone Related Design Standards (14-526 (d) 5)** • Address Historic Preservation Design Review, if applicable • Address any applicable design review standards by zone • Address submission requirements from Design Manual, page 1, addressing neighborhood context • Description of exterior materials, color, finish, and samples
Construction Management Plan		
Yes	NA	
☑	☐	**Construction Management Plan** • Construction Management Document and Plan

LEVEL II AND LEVEL III SITE PLAN
DRAWINGS CHECKLIST

Please upload the following DRAWINGS with the listed details into e-Plan as separate pdfs

RECENT BOUNDARY SURVEY (stamped by Maine Licensed Surveyor)

- [x] Must be in compliance with Technical Manual, Section 13

SITE PLAN(s) (stamped by Maine Licensed Engineer) including:

Existing Conditions

- [x] Approximate location of structures on abutting property
- [x] Topography
- [x] Locate water courses (Fore River)
- [x] Delineate wetlands (Fore River)
- [ ] Zone lines

Proposed Site Plan

- [x] Ground floor area, and grade elevations for all buildings

Access, Circulation, and Parking

- [x] Streets and intersections adjacent to site, any proposed geometric modifications
- [x] Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines
- [x] Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas
- [x] Location and dimensions of proposed loading areas
- [ ] Existing and proposed transit infrastructure with dimensions/ engineering specifications
- [x] Location of vehicle and bicycle parking with dimensions and engineering specifications

Site Considerations

- [x] Identify snow storage areas
- [x] Location of fire hydrants
- [x] Location of solid waste management facilities

UTILITY PLAN including:

- [x] Existing utilities on site and within public streets
- [x] Location, sizing and directional flows of all existing and proposed utilities
- [x] Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site
- [x] Electric utility infrastructure

GRADING AND DRAINAGE PLAN including:

- [x] Existing grades and drainage
- [x] Proposed grades
- [x] Proposed stormwater management meeting Technical Manual (Section 5), standards
- [ ] Location and proposed alteration of a water course
- [x] Preservation or alteration of wetlands

EROSION CONTROL

- [x] Must be in compliance with Technical Manual, Section 5

LANDSCAPE PLAN including:

- [x] Existing vegetation to be preserved and preservation measures
- [x] Proposed landscaping and buffers
- [x] Planting schedule

RECORDING PLAT, if applicable

- [ ] If Subdivision, must be in compliance with requirements of Section 14-496 (b)

ARCHITECTURAL PLANS AND RENDERINGS including:

- [x] Exterior building elevations, color renderings, illustrations of all sides
- [x] Location and dimensions of all existing and proposed HVAC and mechanical equipment, all proposed screening
- [x] Provide context drawings, if applicable (Design Manual, page 1)
- [x] Floor plans

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

Att. C

March 13, 2020

James Rather
City of Portland Development Review Services Manager
389 Congress Street
Portland, ME 04101

Re: Maine International Cold Storage Facility | 40 West Commercial Street
Level III Site Plan Application
Site Location of Development Application

Dear James:

On behalf of Maine International Cold Storage Facility LLC, Woodard & Curran is submitting a Level III Site Plan for the proposed Cold Storage Facility located at 40 West Commercial Street in Portland, Maine. The proposed development resides within the Waterfront Port Development Zone on a currently vacant area of 17.9-acre property. The proposed work includes construction of a single story, 108,024 square-foot building, truck loading area, truck and employee parking areas, fire access drive, and associated site and utility improvements. The interior program will include common business administration space, mechanical rooms, maintenance space, cold storage warehousing, and shipping and receiving docks. A 24-foot wide fire access road will circulate around the building to provide emergency access to all four sides of the building.

The Application documents were prepared in accordance with City of Portland's Chapter 14, Land Use Code of Ordinances and meet the applicable sections of the City of Portland Design and Technical Manuals. The Site Location of Development Application has been prepared in accordance with Maine Department of Environmental Protection Chapter 500 regulations, and it is our understanding that the City will review it under its Delegated Review Authority. The Application reports, attachments and design drawings have been uploaded into the project Eplan folder. If there are any questions on the uploaded materials, please don't hesitate to let me know.

Thank you for coordinating the review of this project. If you have any questions regarding this application, please feel free to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

cc: Eric Carlson, Jedd Steinglass - Woodard & Curran, Inc.
Matthew Dieterich - Treadwell Franklin infrastructure Capital

2. PROJECT DESCRIPTION

Woodard & Curran is submitting this Level III Site Plan Application for the Cold Storage Facility on behalf of the Maine International Cold Storage Facility LLC. A letter authorizing Woodard & Curran to act at the agent on behalf of the Applicant is attached to this Section.

2.1 INTRODUCTION

The proposed Cold Storage Facility project will be located on a parcel of industrial land located along the Fore River at 40 West Commercial Street in Portland, Maine as shown on **Figure 1** (the Site). The Site was operated by Portland Gas Light Company (Portland Gas) between 1852 and 1965. During this time, coal was delivered to the Site by ship and rail and then converted into coal gas, which was used for lighting, heating, and cooking purposes. In 1965, Portland Gas ceased operations at the Site, and the manufactured gas plant (MGP) was decommissioned. In 1966, Portland Gas merged with Lewiston Gas Light Company to form Northern Utilities, Inc. (Northern Utilities). Northern Utilities and a tenant (NGL Energy Partners, LP) operated a natural gas/propane distribution facility at the Site until 2016. The Site is currently owned by the State of Maine (acquired through eminent domain on April 30, 2014) and is currently operated by the Maine Port Authority as part of the adjacent International Marine Terminal (IMT), an intermodal container shipping facility that supports cargo coming and going from the Site via rail, ship, and truck.

In 2014, the State of Maine acquired 23 acres of vacant land (which includes the Site) adjacent to the IMT to develop intermodal rail access and construct a larger trucking yard for freight transfer operations. In addition, logistics and freight capabilities have been expanded through improvements at the container terminal and ocean shipping operations facility at the IMT.

The parcel where the project will be located is a 17.9 +/- acre site. The attached Location Map and Tax Maps show the project location. The property is Tax Map 59, Block A, Lots 1,2,5-11. The project is located within the City of Portland Waterfront Port Development Zone (WPDZ). A portion of the site is also within the Shoreland Protection Zone.

2.2 PROJECT PURPOSE AND NEED

The proposed cold storage facility, when operated in cooperation with existing facilities at the neighboring IMT, will satisfy the need for a northern New England refrigerated logistics facility that can support the domestic and international transport and distribution of refrigerated products.

2.3 EXISTING CONDITIONS

The Existing Conditions Plan, included in the drawings submitted with this application, depicts the existing conditions of the project area, based on a ground-level survey and site observations completed by Owen-Haskell on October 23, 2019. A portion of the development is within the 100-year flood plain; a FEMA flood zone map has been attached to this Section for reference. The Base Flood Elevation for the site is 10, and it is in Special Flood Hazard Area AE.

The area of the 17.9-acre property where the Cold Storage Facility is proposed is currently vacant. There are remnant concrete slabs and pavements, site lights, transformer pads, railroad tracks, and gravels that will be removed. Other portions of the property, outside of the proposed Cold Storage Facility, are being currently being used for various IMT operations. There is also a gas facility operated by Unitil located on the parcel. Topography slopes generally from West Commercial Street towards the Fore River, from approximate elevation 15' down to 10' at the approximate top of bank, before breaking in slope down to the river. The Highest Annual Tide Line is at Elevation 7.2 (NGVD 1929).

2.4 PROPOSED DEVELOPMENT

The intent of the project is to construct a 108,024 square foot cold storage facility within the Waterfront Port Development Zone in Portland. The building will be a single-story structure with varying roof heights. The interior program will include common business administration space, mechanical rooms, maintenance space, the main cold

storage spaces and shipping and receiving docks. A 24-foot wide fire access road will circulate around the building to the west and south along the Fore River, with "knox box" gated accesses located near the passenger car parking areas, and the truck parking areas. Emergency vehicles will have access to all four sides of the building. The access road along the Fore River extends to the Unitil Gas facility. The project will include associated utility and site improvements.

2.4.1 Civil Engineering Approach

The Cold Storage Facility has been designed to separate passenger car traffic from truck traffic. Trucks entering from West Commercial Street will turn east to the loading dock side of the building, which is closer to the rest of the IMT facility. Employee passenger cars will enter from West Commercial Street and turn to the west, to a passenger car parking area located on the west side of the building. Pedestrian walkways will connect the passenger car parking area with the administration portions of the building. A striped crosswalk will provide pedestrian access to West Commercial Street. Pedestrians can then cross at the signalized intersection of West Commercial Street and Beach Street to a sidewalk on the north side of West Commercial Street.

Site work will also include utility improvements to support the cold storage facility. Utility requirements are described in further detail in Section 13 of this report. A set of project design plans showing the proposed Cold Storage Facility is attached to this application. The set includes site, utility, grading and drainage plans, and details to support the site design.

2.4.2 Architectural Approach

The proposed facility is in line with the intended building uses within the Waterfront Port Development Zone. The building is a "working waterfront" facility positioned on a site that is an active part of the Portland "working waterfront." In response to this, CWS Architects has been careful to incorporate a design approach that aligns with the City of Portland's Land Use Ordinance while recognizing the limitations of the building's inherent cold storage facility features. Efforts have been made to break up the form and bring it down to a human scale as well as to introduce interest and respect the context of the surrounding properties.

2.4.2.1 The Massing

In starting the design process, it was apparent that there would be a distinct need break up the bulk of the main cooler portion of the building. A logical solution was to take the spaces that don't require tall open ceiling conditions and place them along the Commercial Street side of the building creating a natural step in the building's overall form. This lower portion of the building houses administration and building utility entrance spaces. This lower form has been carried around the eastern corner and has been pulled away from the western corner helping accent these locations and to break up the form even further. The east elevation incorporates the main loading dock bays and has a lower roof than the main cooler which creates another step in the primary form. The introduction of metal panel joints and accented building elements creates variation and interest on the south and west elevations, breaking up the larger scale of these exposed facades.

2.4.2.2 The Building as a Structure

In areas of the building where the use of the building requires mechanical equipment to be set upon exposed roof areas, two screening alternatives have been incorporated. Along the primary Commercial Street façade, a tall parapet has been incorporated to hide roof top units. Two chillers will need to be placed upon the western roof of the mechanical room. In order to create interest and to assist in hiding the equipment, an open mesh screen wall has been proposed. This will allow openness for required air flow while hiding the equipment. A limited amount of piping will need to extend from this portion of the building to the main roof top. These pipes will need to remain exposed and will celebrate the industrial use. The upper main roof is a pitched roof structure incorporating scuppers and downspouts controlling watershed on both the east and west elevations. This further exemplifies the cold storage use and the inability to utilize

internal roof drains within cooler limits. These downspouts become accent elements assisting in breaking up the wall planes.

2.4.2.3 Details, Color, Texture, Consistency

As employees and visitors arrive on site, they will be directed to the main parking lot area on the Western side of the building. From this lot, the sidewalk circulation will bring them to the main entrance mid-way down the Commercial Street main façade. Because of this, design considerations have been given to introducing human scale elements and common commercial building design assemblies along this façade. The primary façade material will be horizontally oriented insulated metal paneling. This paneling will be 8'-0" long and 30 inches high placed in a stacked bond. A dusty gray/blue accent color has been proposed. Much of the main façade has been opened up with large areas of aluminum storefront window assemblies allowing for natural light and creating transparency along the façade and the wrapped corner conditions. A projecting louver system above the window units will assist in light control and help humanize the scale of the wall. A red brick wainscot with a precast concrete cap has been detailed to draw upon a common Old Port context element.

The primary wall assemblies throughout the build are insulated metal wall paneling oriented vertically. Two colors are proposed. The main cooler assembly will require white or a slightly off-white color in order to avoid excessive heat gain within the space. A gray accent color has been proposed for the mechanical room along the Commercial Street side of the building. The orientation of these panels allows for the incorporation of a horizontal butt joint that creates an accent line around the building breaking up the height of the wall plane.

2.4.2.4 Summary

In summary, we believe that the overall design approach to the project is in alignment with the Waterfront Port Development Zone. CWS has incorporated design elements directly responding to the Design and Visual Character outlined for the ordinance. The project itself will increase commerce and bring added vitality to the Western end helping to continue to on-going redevelopment of the area.

2.4.3 Landscaping Approach

The landscape concept for the Cold Storage Building focuses on two distinct areas of the site: the main building façade and perimeter landscaping, as described in the following sections. Trees, shrubs, and ground covers have been selected based on exposure, type of use, color/flowering characteristics, and growing conditions. Shrubs and groundcovers will be a mixture of evergreen and deciduous plants, providing year-round interest and appropriate to the shady microclimate of the site. We anticipate working closely with the City Arborist on the final selection of these plant species.

2.4.3.1 Main Building Façade

It is recognized that the mass and height of the Cold Storage Building will not be effectively screened or buffered by any amount of landscaping treatment, it is an industrial building in an industrial site. The project site is most visible at the entrance to the property at the intersection of Commercial and Beach Streets in Portland. The building façade on this end of the building is designed to step down from the actual refrigerated building and accommodate the main entrance, offices, break rooms, and mechanical space. It becomes the public face of the project and justifies a significant level of landscape treatment. A fairly narrow planting strip runs the length of this facade, varying in width from 6 ft on the northeast side to over 12 ft in width on the northwest side. Landscape treatment here includes tree planting (River Birch) against the solid wall on the northeast, with evergreen and deciduous planting below and in front of office windows on both sides of the main pedestrian entrance to the building. All plantings in this area will be connected by an understory of New York Fern, providing a low maintenance, naturalized, unifying element along this face of the building. Moving to the west, the landscape area becomes wider (12 ft), and larger shade trees can be

utilized to soften the building massing and break up the façade. We are proposing that this area be seeded as a mowed lawn, projecting a manicured look against the building. Trees in this area are proposed to be Armstrong Maple. We are also proposing to install a massing of evergreen and deciduous shrubbery at the northwest corner of the building to screen the generator and transformer from view.

2.4.3.2 Perimeter Landscaping

The other defined landscapes on the site include shade tree planting (Honeylocust) along the west elevation adjacent to the employee parking area, and groupings of evergreen and deciduous trees (Spruce and Maple) at the northwest and southeast corners of the site to soften the building massing from West Commercial Street and the waterside. Ground treatment in these perimeter areas is proposed to be seeded with a meadow mix, providing a stable vegetated surface that would likely be mowed 2-3 times a year.

2.5 ATTACHMENTS

- Agent Letter
- Location Map
- Tax Map
- FEMA Map
- Civil, Landscape, & Architecture Design Plans (uploaded to Drawings folder in Eplan)
- Architectural Renderings (uploaded to Drawings folder in Eplan)

AMBER
INFRASTRUCTURE GROUP

February 28, 2020

City of Portland

Planning Board

389 Congress St, 4th Floor

Portland, ME 04101

Re: Maine International Cold Storage Facility – Authorization for Permitting

To Whom it May Concern:

On behalf of Maine International Cold Storage Facility, LLC, Woodard & Curran is authorized to apply for Planning Board approval for the proposed Maine International Cold Storage Facility to be located at approximately 40 West Commercial Street in Portland. Furthermore, Woodard & Curran is authorized to act on behalf of Maine International Cold Storage Facility, LLC throughout the permitting process.

Should you have any further questions, please do not hesitate to contact me at Tom.Oshaughnessy@amberinfrastructure.com

Regards,



Tom O'Shaughnessy, President Maine International Cold Storage Facility, LLC



0 1,000 2,000 Feet

IMT COLD STORAGE FACILITY

COMMERCIAL STREET
PORTLAND, ME

FIGURE 1 - SITE LOCATION MAP

N

WOODARD &CURRAN

Project #: 0232277.00
Map Created: September 2019

Figure Exported: 9/25/2019 By: staylslin Using: \\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Permitting\ACOE Category II Permit\Figure 1 Site Location.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** ESRI, National Geographic

D9SW D9SE D10SW

059 A001
059 A011
059 A001
059 A001
169406
2
059 A008
059 A009
059 A010
44188
18134
120
2 - 130
1 - 129
CASCO BAY BRIDGE
N
059 A002
059 A007
059 A006
87200
059 A005
059 A003
68492
059 A004
70114

C9NW C7NE

City of South Portland

1 inch = 50 feet

D8SE D9SW D9SE

C8NE C9NE

061 H005 061 H008 057 F001 060 C002 058 C040 65 75 058 C001 061 H004 060 A001 060 C001 81 055 C040 83 85 69624 26335 060 D002 5900 060 D001 6643 COMMERCIAL ST 30 - 108 29 - 109 059 A001 2 059 A001 059 A011 060 B001 060 E001 060 E003 111 - 293 110 - 296 060 F001 250174 059 A002 060 F002 059 A003 059 A007 059 A005 060 F003 059 A006 70114 059 A004 BULKHEAD AND OR FILL LINE 060 F004 DOCK 146678

1 inch = 50 feet

C8SE

April 1 2012 fy 2013 Tax Map Index; http://www.portlandassessors.com/taxmaps.htm

Index Number - C9NW

D9NW D9NE D10NW

D9SW C7NE

C9NW C9NE

BRACKETT ST
TATE ST
SUMMER ST
YORK ST
CLARK ST
BEACH ST
COMMERCIAL ST
INTERNATION MARINE TERMINAL RD
CASCO BAY BRIDGE

WATERFRONT CONDO
HARBOR VIEW CONDO
HARBOR VIEW CONDO
FORE RIVER PLACE CONDO

058 B007 058 B008 058 B006 058 B005 058 B004 058 B003 058 B015 058 B016 058 B022 058 B018 058 B019 058 B021 058 B020 058 B014 058 B011 058 B023 058 B013 058 B012 058 D001 058 D002 058 D003 058 D004 058 D005 058 D006 058 D007 058 D008 058 D009 058 D010 058 D011 058 D012 058 D013 058 D014 058 F014 058 F013 058 F012 058 F009 058 F006 058 F003 058 C007 058 C040 058 C004 058 E002

044 E014 044 E012 044 E010 044 E008 044 E007 044 E004 044 D001 044 E006 044 E001 044 E002 044 E003

043 A005 043 A009 043 A004 043 A008 043 A003 043 A011 043 A002 043 A013 043 A001 043 A007 043 E008 043 E002 043 E001 043 E007 043 E009 043 E010 043 D006 043 G002 043 H001 043 H002 043 G001 043 D005 043 D007

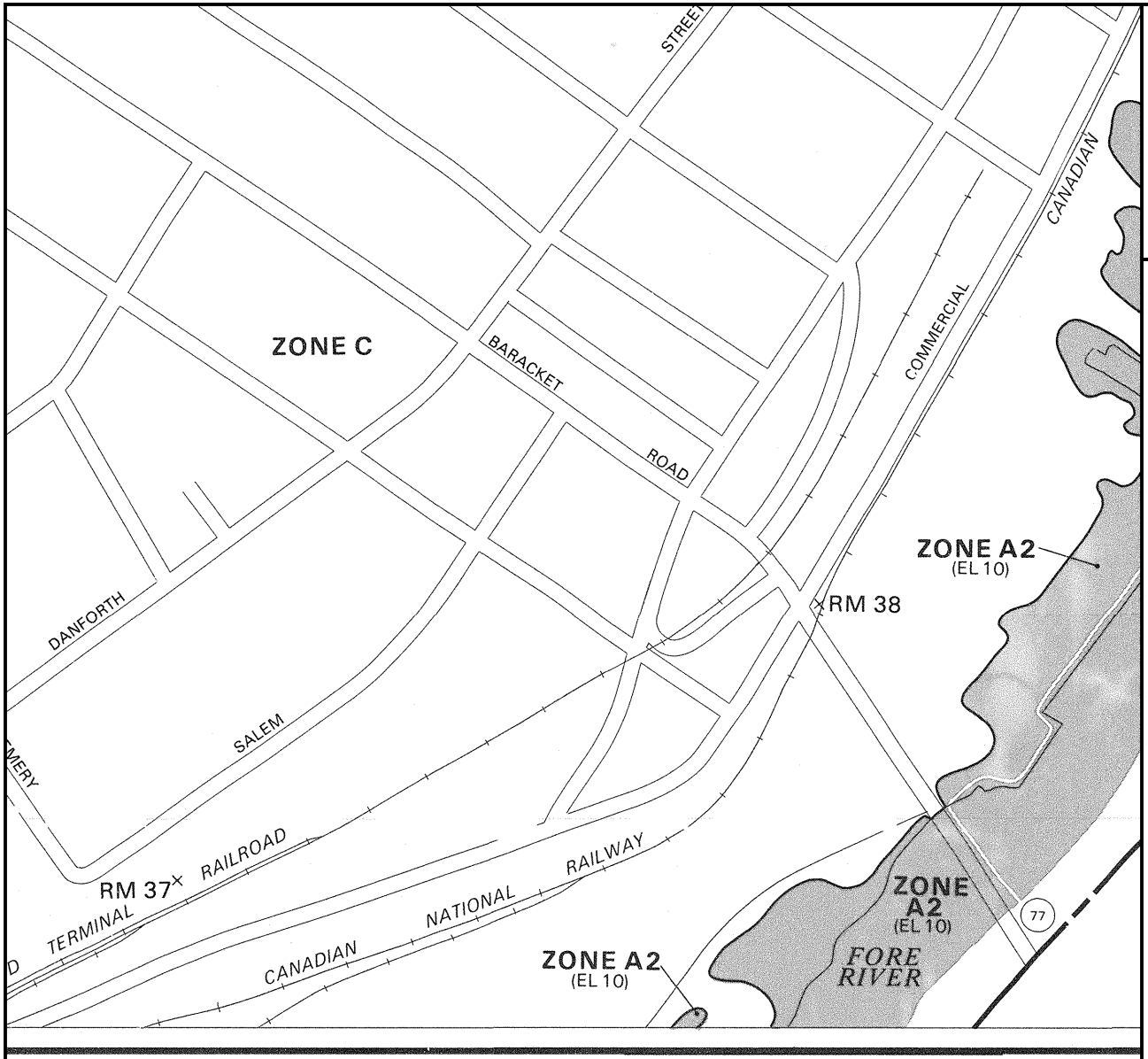
059 A001 059 A007 059 A008 059 A011 059 A002 059 A009 059 A010

City of South Portland

1 inch = 50 feet

April 1 2012 fy 2013 Tax Map Index; http://www.portlandassessors.com/taxmaps.htm

Index Number - D9SE



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

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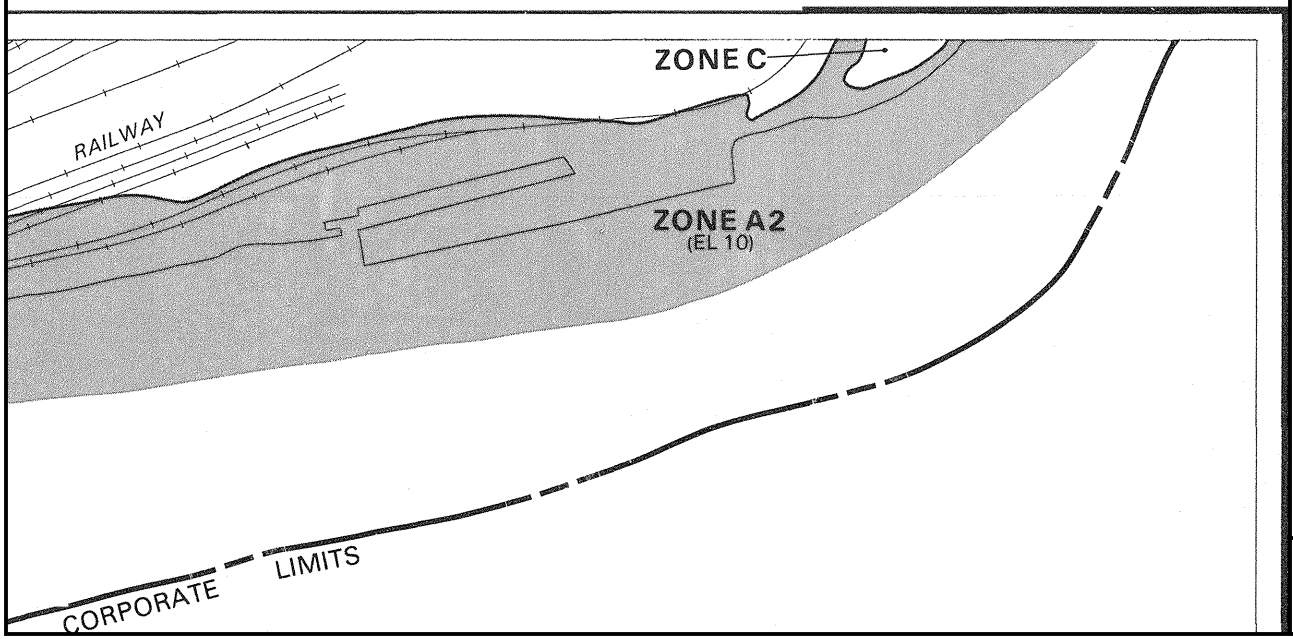

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 16 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0016 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

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Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
5 PALMER STREET BATH, MAINE 04530
TEL (207) 443-5447

Main Port Authority Cold Storage Facility
Portland, Maine

March 2, 2020
Revised May 11, 2020
Revised July 29, 2020

PROPOSED SITE LIGHTING

Basis of Site Lighting Design

The *Illuminating Engineering Society of North America* (*IESNA*) publishes recommended lighting standards for marine port facilities in RP-40-19 Recommended Practice: Lighting Port Terminals. RP-40-19 recommends the following horizontal illuminance levels:

Average Illuminance at Grade:	38 Lux (3.5 footcandles)
Minimum Illuminance at Grade:	11 Lux (1.0 footcandle)
Maximum-to-Minimum Uniformity Ratio:	6.0-to-1 or less

The *IESNA* also publishes recommended lighting standards for open parking facilities in RP-8-19 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting. RP-8-18 recommends the following horizontal illuminance levels for parking areas and associated rive areas that are paved with asphalt:

Minimum Illuminance at Grade:	5 Lux (0.46 footcandles)
Maximum-to-Minimum Uniformity Ratio:	15.0-to-1 or less

Section 12 of the City of Portland Technical Manual stipulates the following illuminance design criteria:

Average Illuminance at Grade:	1.25 footcandles
Minimum Illuminance at Grade:	0.2 footcandle
Maximum Illuminance at Grade:	5.0 footcandles
Maximum-to-Minimum Uniformity Ratio:	20.0-to-1 or less

Additionally, The Technical Manual stipulates that the maximum lighting pole height for large industrial facilities (> 50,000 SF) be not greater than 30-feet.

The proposed site lighting design has been prepared to provide user safety while respecting reasonable design criteria. The requirement to keep the marine port loading/unloading and dock vehicle areas clear of lighting poles makes the lighting layout a challenge given the width of the paved area. Lighting for the marine port loading/unloading and dock vehicle areas is proposed to consist of lighting poles along the perimeter of the paved area, as well as building mounted lighting.

The following design criteria serve as the basis for the overall site lighting design:

- Illuminance Levels:
  - Parking Lot and Access Drives

Average Illuminance at Grade:	1.25 footcandles
Minimum Illuminance at Grade:	0.5 footcandle
Maximum Illuminance at Grade:	5.0 footcandles
Maximum-to-Minimum Uniformity Ratio:	15.0-to-1 or less

  - Marine Cold Storage Loading/Unloading Area

Average Illuminance at Grade:	2.5 footcandles
Minimum Illuminance at Grade:	0.75 footcandle

Maximum Illuminance at Grade: 5.0 footcandles
Maximum-to-Minimum Uniformity Ratio: 6.0-to-1 or less

- Mounting Heights
  - Parking Lot and Access Drives
    - Lighting Poles: 20-feet (maximum)
    - Building Mounted Lights: 20-feet (maximum)
  - Marine Cold Storage Loading/Unloading Area
    - Lighting Poles: 35-feet (maximum)
    - Building Mounted Lights: 30-feet (maximum)

Requirements for site lighting are addressed by the City of Portland in two documents: The City of Portland, Maine - Code of Ordinances, and the City of Portland - Technical Manual. Listed below are the issues pertaining to the proposed site lighting as relates to the two city documents.

The City of Portland - Maine Code of Ordinances

Chapter 14 – Land Use
Article V Site Plan

14-526.6 Exterior Lighting

a. Site Lighting

(i) All exterior site lighting, including lighting of building entrances, shall be full cut-off with no light emitted above the horizontal plane or spilled onto adjacent properties and streets. Illumination levels shall be adequate but not excessive for safety, comfort and convenience of occupants and users of the site and shall conform to applicable standards of Section 12 of the Technical Manual.

RESPONSE: The *Illuminating Engineering Society of North America* (*IESNA*) classifies exterior luminaires in the publication *IESNA* TM-15-11 Luminaire Classification System for Outdoor Luminaires according to their potential for producing uplight. The rating system is a numeric index that ranges from zero (no uplight) to five (greater than 1000 lumens uplight. All the proposed site lighting luminaires are classified as having an uplight rating of (U0) Zero Uplight Component.

14-526.6 Exterior Lighting

a. Site Lighting

(ii) For major or minor site plans within or abutting a residential use or zone where light from the proposed development may adversely impact adjacent residential properties, exterior lighting shall employ house-side shielding.

RESPONSE: Not applicable (project does not abut a residential zone)

The City of Portland Technical Manual

Section 12 Site Lighting Standards

12.3 General Standards

Outdoor lighting standards listed below apply to all new developments.12.3.

1. Uniformity: As measured in foot candles at grade, maximum-to-minimum illumination levels shall not exceed a ratio of twenty (20) to one (1).

RESPONSE: The maximum-to-minimum illumination ratio for the proposed site lighting is:

- Access Drives 6.4-to-1
- Parking Lot 3.6-to-1
- Marine Loading/Unloading Area 4.7-to-1
- Loading Dock 5.0-to-1

---

2. Illumination Levels: Minimum, Maximum, and Average illumination levels for areas intended to be lighted, as measured at grade, shall be:

Minimum	*0.2 footcandles (fc*
Maximum	*5.0 footcandles (fc)*
Average	*1.25 footcandles (fc)*

RESPONSE: The horizontal illumination levels for the proposed site lighting are as follows:

- Front Entrance/Exit Drive:
  - Average Illuminance at Grade: 1.2 footcandles
  - Minimum Illuminance at Grade: 0.5 footcandles
  - Maximum Illuminance at Grade: 3.2 footcandles
- West Parking Lot:
  - Average Illuminance at Grade: 1.2 footcandles
  - Minimum Illuminance at Grade: 0.5 footcandle
  - Maximum Illuminance at Grade: 1.8 footcandles
- Marine Port Loading/Unloading Area:
  - Average Illuminance at Grade: 2.1 footcandles
  - Minimum Illuminance at Grade: 0.9 footcandle
  - Maximum Illuminance at Grade: 3.9 footcandles
- Loading/Unloading Docks Area:
  - Average Illuminance at Grade: 2.7 footcandles
  - Minimum Illuminance at Grade: 1.0 footcandle
  - Maximum Illuminance at Grade: 5.0 footcandles

The proposed minimum and maximum illuminance levels conform to the 12.3.2 standard. The average illuminance at the marine port loading/unloading area exceeds the 1.25 footcandle criteria as stipulated in the City Technical Manual. The average illuminance in this area is proposed as being necessary to promote the safety of loading/unloading activities.

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3. Lumens: No fixture shall exceed 20,000 lumens (+/- 3%)

Types of Lighting	Maximum Lumens Allowed
Building Entrance	3,500 lumens

RESPONSE: The lumen ratings of the proposed site lighting luminaires at building entrances are all less than 3,500 lumens. The lumen rating of the proposed site lighting luminaires along the access drives, and at the parking lot are less than 20,000 lumens.

- Fixture Type S1A 2,846 lumens
- Fixture Type S2A 1,424 lumens
- Fixture Type S2B 9,300 lumens
- Fixture Type S4A 5,272 lumens
- Fixture Type S4C 5,272 lumens

The lumen output of luminaire Type S2B will be reduced to 6,268 lumens by means of dimming controls. The lumen output of the parking lot pole lights Type S4C will be reduced to 3,690 lumens by means of dimming controls. The lumen output of luminaire Type S4A with be reduced to 2,636 lumens at the Front Entrance/Exit Drive by means of dimming controls.

The lumen rating of the pole lights (Types S4D and S4E) that illuminate the marine port loading/unloading area exceed 20,000 lumens. Although this exceeds the 12.3.3 standard it is suggested that this is appropriate considering the potential for user safety at these areas.

- Fixture Type S4D 30,400 lumens
- Fixture Type S4E 25,913 lumens

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4. *Light Trespass: The maximum illumination level at a property line shall not exceed 0.1-foot candle, as measured at grade, except where abutting industrial, or other non-sensitive uses. When a commercial or industrial use abuts a public right-of-way, or another commercial or industrial use, lighting must be designed so that the illumination at the property boundary line does not exceed 1.0 foot-candles.*

RESPONSE: No illuminance level across the property line exceeds 0.1 footcandle.

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5. *Luminaire Types: All fixtures must be LED and shall not exceed 3000K Correlated Color Temperature (CCT). Screw in light fixtures must have LED lamp specified to be maximum of 3000K CCT.*

RESPONSE: All proposed light fixtures utilize LED lamps with 3000K CCT.

6. *Full Cut-off Fixtures and Shielding Required: All outdoor lighting fixtures, including pole mounted and wall mounted luminaires, shall be constructed Full "cut-off" or with full shielding, type where lenses, refractors or lamp sources do not extend below the surface of the fixture housing and no direct light shall be directed at or above the horizontal plane.*

   Where the light source from an outdoor light fixture is visible beyond the property line, shielding shall be required to reduce glare so that the light source is not visible from within any residential dwelling unit.

   Light fixtures mounted under a canopy shall be recessed to that the lens cover is recessed into, or flush with, the underside (ceiling) of the canopy.

RESPONSE: All proposed site lighting luminaires are classified as "full cut-off". The construction of the proposed canopies does not allow for recessed light fixtures. The proposed canopy-mounted light fixtures (Type S1A) are surface mounted on the underside of entrance canopies, and they include flush lenses that do not project below the fixture housing.

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8. *Fixture Height: Fixtures shall be mounted at the lowest height necessary to meet city standards and the height is measured from grade to the bottom of the light fixture.*

Type of Lighting	Maximum Fixture Height
Residential (Pedestrian) Uses	20 feet
Commercial/ Office Uses	20 feet
Large Industrial Uses (50,000 sf or more- gross floor area)	30 feet
Building Mounted/ Entrances	below the roof eave and not to exceed 20 feet, whichever is lower
Bollard Fixtures	42 inches (3.5 feet)

RESPONSE: The maximum height of proposed site lighting fixtures at access drives, the parking lot, and at entrance/exit doors is less than 20 feet. The maximum height of proposed site lights at the marine port loading/unloading area is 34 feet. Given the width of the loading/unloading apron area, and the requirement for increased illumination levels to promote safety, it is necessary to set the pole height in this area to 34 feet. This matches the height of the existing site lighting poles that were installed in this area under the most recently IMT project.

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9. *Lighting Curfew: For surface and structured parking, lighting in vehicle parking areas containing twenty (20) or more parking spaces shall be reduced to 50% of permitted levels from one hour after business closing to one hour before business opening. If lighting levels are already below 50% of permitted levels, no curfew adjustment is required. Motion sensor activated lighting shall be permitted during closing hours to activate additional lighting above the 50% permitted, for the purposes of public safety.*

RESPONSE: The facility operation extends 24 hours per day. Accordingly, it is proposed that the site lighting be operational for all hours from dusk until dawn.

10. *Continued Maintenance: Lighting installations must be maintained in good repair to meet the provisions of this ordinance on an on-going basis.*

RESPONSE: All proposed lighting will be maintained in full working order.

11. *General Exceptions: proposed uses that demonstrate a need to exceed the specific site lighting limits shown below for safe and reasonable exercise of the proposed use must provide a professionally produced lighting plan which adheres to the current Illuminating Engineering Society of North America (IESNA) recommendations for the proposed use. The planning Authority may grant exceptions to the lighting standards with the finding that the light impacts do not create a public nuisance for abutting residential property. Unless otherwise specified below, exterior lighting shall conform to the recommendations put forth in Lighting for Exterior Environments RP-33-14, or its successor, published by the Illuminating Engineering Society of North America (IESNA). Lighting fixtures other than full cut-off fixtures may be allowed only if acceptable luminaires shall include internal and/or external glare control louvers and installed so as to minimize uplight and offsite light trespass.*

RESPONSE: The proposed lighting conforms to the recommendations published in Lighting for Exterior Environments RP-33-14

The following exceptions to the City of Portland Technical Manual are requested:

- Paragraph 12.3.2
  Proposed average illuminance at the marine port loading/unloading area:
  2.1 footcandles
  Proposed average illuminance at the marine port loading/unloading dock area:
  2.7 footcandles
- Paragraph 12.3.3
  Proposed lumen rating for Type S4D pole lights at the marine port loading/unloading area:
  30,400 lumens
  Proposed lumen rating for Type S4E pole lights at the marine port loading/unloading area:
  25,913 lumens
- Paragraph 12.3.8
  Proposed luminaire height for Type S4D and Type S4E pole lights at the marine port loading/unloading area:
  34 feet

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
5 PALMER STREET BATH, MAINE 04530
TEL (207) 443-5447

Maine Port Authority Cold Storage Facility

Portland, Maine
June 1, 2020

PROPOSED SITE LIGHTING LUMINAIRES AND LIGHTING POLES

TYPE S1A: UNDER-CANOPY LIGHTS WITH AN IES TYPE 5QW DISTRIBUTION PATTERN.

TYPE S2A: WALL LIGHTS ABOVE ENTRANCE/EXIT DOORS.

TYPE S2B: WALL LIGHTS ILLUMINATING THE MARINE PORT LOADING/UNLOADING AREA. THE LUMINIRES WILL HAVE AN IES FORWARD THROW DISTRIBUTION PATTERN AND WILL BE DIMMED TO 65% RATED OUTPUT.

TYPE S4A: POLE LIGHT WITH 18-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 6-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 24" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION PATTERN AND WILL BE DIMMED TO 50% RATED.

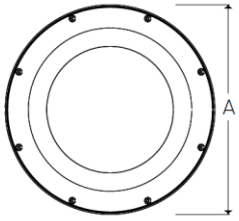
TYPE S4C: POLE LIGHT WITH 14-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 48-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 24" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION PATTERN AND WILL BE DIMMED TO 70% RATED OUTPUT.

TYPE S4D: POLE LIGHT WITH 30-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 48-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 96" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION.

TYPE S4E: POLE LIGHT WITH 30-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 48-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 96" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION .

SRT1 EDGE-LIT





A	B	Weight
12" (304mm)	3.1" (78mm)	8lbs (3.6kg)

- For ceiling mount and parking garage applications from an 8–15 foot mounting height
- Edge-lit flat lens for optimal visual comfort and uniformity across the lens
- Two optical distributions specifically design for parking garage and canopy applications are available making the Beacon Edge-Lit luminaire both versatile and functional
- UL/cUL listed for we locations, IP65 and 3G vibration rated
- Occupancy sensor available for complete on/off and dimming operation

HOUSING

- Die-cast aluminum housing ensures long electrical component life and luminaire performance
- Corrosion resistant powder coat finish both protects and provides architectural appearance
- One piece molded silicone gasket ensures weather proof seal
- Thermally isolated driver mounted to dedicated bracket reduces operating temperatures and increases driver life and reliability

OPTICS

- Edge-lit acrylic light guide provides blended non-pixelated light for unprecedented visual comfort
- Choice of multiple light outputs with lumen range of 2500–6000
- Two distribution types: Type 5 Square Wide, Type 5 Concentrated
- Wide variety of CCT's and CRI's offered: 3000K (70CRI), 3000K (80CRI), 3500K (80CRI), 4000K (70CRI), 4000K (80CRI) or 5000K (70 CRI) CCT

Series	
SRT1	Edge-Lit Parking Garage Size 1

Engine	
20	20W Nominal 2500 lm
35	35W Nominal 4000 lm
55	55W Nominal 6000 lm

CCT	
3K7	3000K, 70 CRI
3K8	3000K, 80 CRI
35K7	3500K, 80 CRI
4K7	4000K, 70 CRI
4K8	4000K, 80 CRI
5K7	5000K, 70 CRI

Distribution	
5QW	Type 5 Square Wide
5C	Type 5 Concentrated

Voltage	
UNV	120V-277V
120	120V
208	208V
240	240V
277	277V

Color/Finish	
BL	Textured Black
DB	Textured Dark Bronze
GT	Graphite Textured
GYS	Smooth Gray
PS	Smooth Plat. Silver

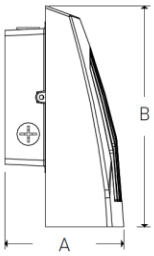
Nominal Watts	Nominal Lumens	Distribution	5K (5000K NOMINAL 70 CRI)					4K (4000K NOMINAL 70 CRI)					3K (3000K NOMINAL 70 CRI)				
			Lumens	LPW	B	U	G		LPW	B	U	G	Lumens	LPW	B	U	G
20	3000	5C	3093	136.86	1	0	1	3078	136.21	1	0	1	2960	130.97	1	0	1
		5QW	2974	131.60	1	0	1	2960	130.97	1	0	1	2846	125.93	1	0	1

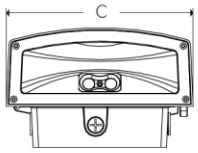
Type S1A: 5QW Distribution

SLING SERIES



SG1





A	B	C	Weight
4.19" (107mm)	7.80" (198mm)	6.61" (168mm)	4.4lbs (2kg)

- SG1 Series replaces from 100W-150W HID; SG2 Series replaces from 150W-250W HID
- Comfort lens available as an option or accessory provides glare control and enhanced uniformity
- Knuckle and trunnion accessory mounting kits available for flood applications
- IP65 and certified to UL 1598 for use in wet locations up to 40°C ambient
- DLC (DesignLights Consortium Qualified - see www.designlights.org

HOUSING

- Rugged die-cast aluminum housing with corrosion resistant powder coat finish
- Heating dissipating fins provide superior thermal performance extending the life of the electronic components
- Impact resistant tempered glass offers zero uplight
- Comfort lens available as an option or accessory to reduce glare (7-10% lumen reduction) and provide better uniformity

OPTICS

- 3000K, 4000K and 5000K CCT nominal with 70 CRI
- Smaller SG1 housing has 2 LEDs, larger SG2 housing has 3 LEDs

Housing	
SG1-10	Size 1, 10W
SG1-20	Size 1, 20W
SG1-30	Size 1, 30W
SG1-40	Size 1, 40W
SG2-50	Size 2, 50W
SG2-80	Size 2, 80W

CCT/CRI	
3K7	3000K, 70 CRI
4K7	4000K, 70 CRI
5K7	5000K, 70 CRI

Distribution	
FT	Fwd Throw

Voltage	
UNV	120V-277V
120	120V
277	277V
UHV	347V-480V

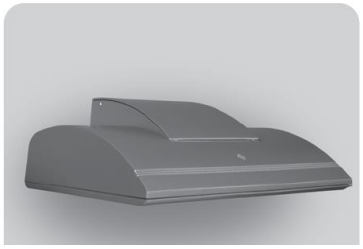
Color/Finish	
DB	Textured Dark Bronze
BL	Textured Black
WH	Textured White
GYS	Smooth Gray
PS	Smooth Plat. Silver
CC	Custom Color

Control Options	
PCU	Universal Button Photocontrol (120-277V)
SCP[1,2,3]	Occupancy Sensor Programmable (Dim)
SWP[1,2]	SiteSync Pre-commission
SWPM[1,2]	SiteSync Pre-commission w/ Sensor
Specify MTG HT for SCO/SCP & SWPM	
8F	Up to 8'
20F	Up to 20'

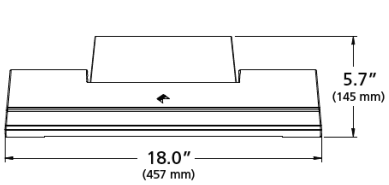
Options	
CS	Comfort Lens
E[1,2]	Battery 0°C
EH[1,2]	Battery w/ heater -20°

Description	# of LEDs	Drive Current	System Watts	5K (5000K NOMINAL 70 CRI)					4K (4000K NOMINAL 70 CRI)					3K (3000K NOMINAL 80 CRI)				
				Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
SG1-10	2	140mA	11	1349	122	1	0	0	1424	129	1	0	0	1003	91	1	0	0
SG1-20	2	250mA	21	2449	115	1	0	0	2310	110	1	0	0	2054	95	1	0	0

HUBBELL Outdoor Lighting



Wall Director® Medium



Housing

- Optical housing is a one-piece, die-cast low copper (<0.6%) aluminum alloy with integral heat sink. The housing rotates against mounting arm housing to provide -5° to 10° of adjustment with degree markers cast into the housing. At 0° adjustment, lens is totally concealed from view above horizontal with fixture mounted in the downward position.
- Mounting arm housing is one-piece die-cast, low copper (<0.6%) aluminum alloy with provisions for tilt mechanism. Mounting arm fastens to the mounting plate with keyhole slots freeing both hands for securing and wiring. One stainless steel socket-head screw on the tilt mechanism frees the optical housing to rotate for aiming. Tightening the screws locks the housing and lens frame together with sealing provided by a silicone gasket. For visual aiming, adjustment may be accomplished with the fixture on.
- Lens Frame is a one-piece, die-cast low copper (<0.6%) aluminum alloy with integral cooling fins to dissipate driver thermal.
- Luminaire housing shall be free of any visible heat fins, hardware or fasteners.
- Bracketry and hardware shall be stainless steel.

Specifications

- Luminaire shall be capable of operating at 100% brightness in a 40°C environment. Both driver and optical array shall have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C.
- Luminaires not configured with a control system shall be provided with 0-10 purple and gray dimming leads.

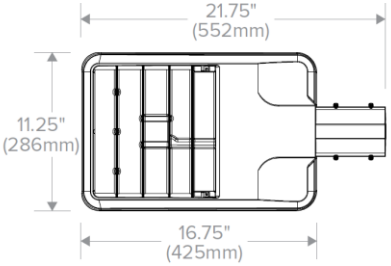
Fixture	Mounting	Source	Wattage	Light Engine	Distribution	Voltage
WDM Wall Director Medium	D Down	48L 48 LEDs	55 55 Watts	3K7 3000K/70CRI	1 Type I	UNV 120-277V
	U[1] Up		65 65 Watts	3K8 3000K/80CRI	2 Type II	347 347V
			85 85 Watts	4K7 4000K/70CRI	3 Type III	480 480V
			105 105 Watts	4K8 4000K/80CRI	4W Type IV Wide	
			130 130 Watts	5K7 5000K/70CRI	4F Type IV Forward	
					WG[2] Wall Graze	
					SP Spot/Column	
					FTD[2] Forward Throw Diffuse	
					WTD[2] Wide Throw Diffuse	

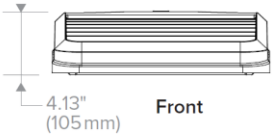
LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
48L	10,000	88	Clear Lens	1	11194	1	0	1	127	11476	1	0	1	130	11607	1	0	1	132
				2	10601	2	0	2	120	10867	2	0	2	123	10991	2	0	2	125
				3	10779	1	0	2	122	11050	1	0	2	126	11177	1	0	2	127
				4F	10576	1	0	2	120	10842	1	0	2	123	10966	1	0	2	125
				4W	10285	2	0	2	117	10544	2	0	2	120	10665	2	0	2	121
				SP	11870	5	0	1	135	12168	5	0	1	138	12308	5	0	1	140
			Diffuse Lens	WG	10695	3	0	1	122	10964	3	0	1	125	11090	3	0	1	126
				FTD	9300	2	0	2	106	9534	2	0	2	108	9643	2	0	2	110
				WTD	10065	2	0	2	114	10318	2	0	2	117	10436	2	0	2	119

KIM LIGHTING

VIPER S







CONSTRUCTION

- Manufactured with die cast aluminum
- Coated with a polyester finish that meets ASTM B117 corrosion test requirements and ASTM D522 cracking and loss of adhesion test requirements
- IFS polyester powder-coat electrostatically applied and thermocured. IFS finish consists of a five stage pretreatment regimen with a polymer primer sealer and top coated with a thermoset super TGIC polyester powder coat finish
- The finish meets the AAMA 2604 performance specification which includes passing a 3,000-hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pounds
- External hardware is corrosion resistant

OPTICS

- Cartridge is held together with internal brass standoffs soldered to the board so that it can be field replaced as a one-piece optical system
- One-piece silicone gasket ensures a weatherproof seal around each individual optic
- One-piece optical cartridge system consisting of an LED engine, optics, gasket and stainless steel bezel

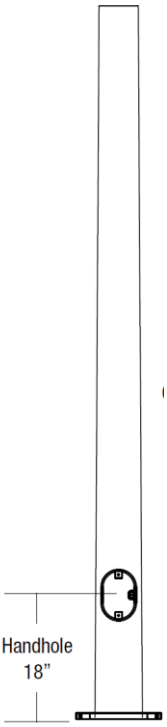
VPS – _____ – _____ – _____ – _____ – _____ – _____

Series		LED Engine		CCT/CRI[7]		Distribution		Rotation		Voltage	
VPS	Viper Small	24L-55	55W, LED array	3K7	3000K, 70 CRI	FR	Type 1/Front Row	Blank	No rotation	UNV	120–277V
		36L-65	65W, LED array	4K7	4000K, 70 CRI	2	Type 2	L	Optic rotation left[5]	347	347V
		36L-80	80W, LED array	5K7	5000K, 70 CRI	3	Type 3	R	Optic rotation right[5]	480	480V
		48L-110	110W, LED array			4	Type 4				
		60L-136	136W, LED array			4W	Type 4 Wide				

Mounting		Color		Control Options	
A	Rectangular Arm (formerly RA) for square or round pole	BL	Black Textured	7PR	7-Pin Receptacle only (shorting cap, photo control, or wireless control provided by others)
MAF	Mast Arm Fitter (formerly SF2) for 2⅜" OD horizontal arm	DB	Dark Bronze Textured	7PR-SC	7-Pin Receptacle w/Shorting Cap
K	Knuckle (formerly PK2) limit to 30° tilt or 2⅜" OD horizontal arm or vertical tenon	GYS	Light Gray Smooth	7PR-TL	7-Pin Receptacle w/Twist-Lock® photo control
		PS	Platinum Silver Smooth		

DELIVERED LUMENS

				5K (5000K nominal, 70 CRI)					4K (4000K nominal, 70 CRI)					3K (3000K nominal, 70 CRI)				
# of LEDs	DRIVE CURRENT (mA)	SYSTEM WATTS	DISTRIBUTION TYPE	LUMENS	LPW	B	U	G	LUMENS	LPW	B	U	G	LUMENS	LPW	B	U	G
24	700 mA	55W	FR	6357	118	1	0	1	6486	120	1	0	1	5804	107	1	0	1
			2	6132	114	1	0	1	6257	116	1	0	2	5599	104	1	0	1
			3	6015	111	1	0	2	6137	114	1	0	2	5492	102	1	0	2
			4	5921	110	1	0	2	6034	112	1	0	2	5400	100	1	0	2
			4W	5793	108	1	0	2	5909	110	1	0	2	5272	98	1	0	2



CONSTRUCTION

- SHAFT: One-piece tapered aluminum with round cross section, made of 6061-T6 shaft and 356-T6 cast aluminum base

GROUP 2

- ANCHOR BOLTS: Supplied with (4) galvanized anchor bolts with minimum yield of 55,000 psi (ASTM F1554). Galvanized hardware with two washers and two nuts per bolt for leveling
- BOLT COVER: Four individual bolt covers provided
- POLE CAP: Pole shaft supplied with removable cover when applicable; Tenon and post-top configurations also available
- HANDHOLE: 4" X 6" handhole opening with cover and grounding provision handhole 3" x 5" for 20' pole. The handhole is located 18" from the base of the pole.

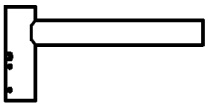
FINISH

- Durable thermoset polyester powder coat paint finish with nominal 3.0 mil thickness
- Decorative finish coat available in six standard colors; Custom colors available, RAL number preferred

MOUNTING		DRILL PATTERN		FINISH		OPTIONS	
1	Single arm mount	B1	Cruzer, "AM" arm	DB	Dark Bronze Textured	GFI[1]	20 Amp GFCI Receptacle and Cover
2	Two fixtures at 180°	B3	2 bolt (2-1/2" spacing Viper "A" arm)	BBT	Basic Black Textured	EHH[1]	Extra Handhole
2L	Two fixtures at 90°	S2	2 bolt (3-1/2" spacing Viper "AD" arm)	BL	Black Textured	C05[1]	.5" Coupling
3T	Three fixtures at 90°			BZT	Bronze Textured	C07[1]	.75" Coupling
3Y	Three fixtures at 120°			WH	White Textured	C20[1]	2" Coupling
4	Four fixtures at 90°			PS	Platinum Silver Smooth	VM2	2nd mode vibration damper
TA	Tenon (2.375" OD)			GT	Graphite Textured	LAB	Less Anchor Bolts
TB	Tenon (2.875" OD)			GYS	Gray Smooth		
TC	Tenon (3.5" OD)			CC	Custom Color		
OT	Open Top (includes pole cap)						

Catalog Number	Height		Nominal Shaft Dimensions	Wall Thickness	Bolt Circle	Bolt Circle Range	Base Plate Size	Base Plate Shape	Anchor bolt size	Bolt Projection	Pole weight
	Feet	Meters									
Group 1											
RTA-B-10-40-A	10	3.0	4" x 3"	.125"	7"	-	7.25	Triangular	3/4x17x3"	3.25"	24
RTA-B-12-40-A	12	3.7	4" x 3"	.125"	7"	-	7.25	Triangular	3/4x17x3"	3.25"	27
RTA-B-14-40-A	14	4.3	4" x 3"	.125"	7"	-	7.25	Triangular	3/4x17x3"	3.25"	32
RTA-B-16-50-A	16	4.9	5" x 3"	.125"	8"	-	8.31	Triangular	3/4x17x3"	3.25"	35
RTA-B-18-50-A	18	5.5	5" x 3"	.125"	8"	-	8.31	Triangular	3/4x17x3"	3.25"	42

SPOKE TYPE BRACKETS

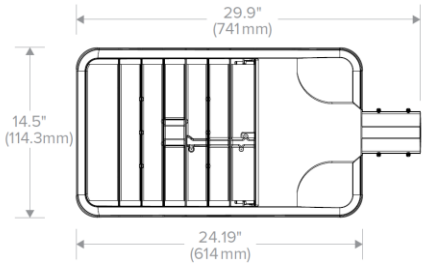


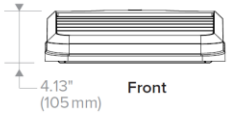
CONFIGURATION	LENGTH	POLE TENON SIZE	COLOR
1	8"	PT20 2" pipe tenon (2.38" O.D.)	DB Dark bronze textured
2-180	12"	PT25 2.5" pipe tenon (2.88" O.D.)	BL Black textured
2-90	18"	PT35 3.5" pipe tenon (4.0" O.D.)	WH White textured
3-120	24"		GR Gray textured
3-90	30"		PS Platinum silver smooth
4-90			GYS Light gray smooth

Type S4A: 18-Foot Pole with 6-Inches Exposed Concrete Foundation Base
Type S4C: 14-Foot Pole with 48-Inches Exposed Concrete Foundation Base

VIPER S







CONSTRUCTION

- Manufactured with die cast aluminum
- Coated with a polyester finish that meets ASTM B117 corrosion test requirements and ASTM D522 cracking and loss of adhesion test requirements
- IFS polyester powder-coat electrostatically applied and thermocured. IFS finish consists of a five stage pretreatment regimen with a polymer primer sealer and top coated with a thermoset super TGIC polyester powder coat finish
- The finish meets the AAMA 2604 performance specification which includes passing a 3,000-hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pounds
- External hardware is corrosion resistant

OPTICS

- Cartridge is held together with internal brass standoffs soldered to the board so that it can be field replaced as a one-piece optical system
- One-piece silicone gasket ensures a weatherproof seal around each individual optic
- One-piece optical cartridge system consisting of an LED engine, optics, gasket and stainless steel bezel

Series	
VPL	Viper Large

LED Engine	
64L-135	135W LED array
80L-180	180W LED array
80L-235	235W LED array
96L-220	220W LED array
96L-280	280W LED array
96L-315	315W LED array
96L-395	395W LED array

CCT/CRI[7]	
3K7	3000K, 70 CRI
4K7	4000K, 70 CRI
5K7	5000K, 70 CRI

Distribution	
FR	Type 1/Front Row
2	Type 2
3	Type 3
4	Type 4
4W	Type 4 Wide
5QM	Type 5QM
5QN	Type 5QN

Rotation	
Blank	No rotation
L	Optic rotation left[5]
R	Optic rotation right[5]

Voltage	
UNV	120–277V
347	347V
480	480V

Mounting	
A	Rectangular Arm (formerly RA) for square or round pole
MAF	Mast Arm Fitter (formerly SF2) for 2⅜" OD horizontal arm
K	Knuckle (formerly PK2) limit to 30° tilt

Color	
BL	Black Textured
DB	Dark Bronze Textured
GYS	Light Gray Smooth

Control Options	
7PR	7-Pin Receptacle only (shorting cap, photo control, or wireless control provided by others)
7PR-SC	7-Pin Receptacle w/Shorting Cap

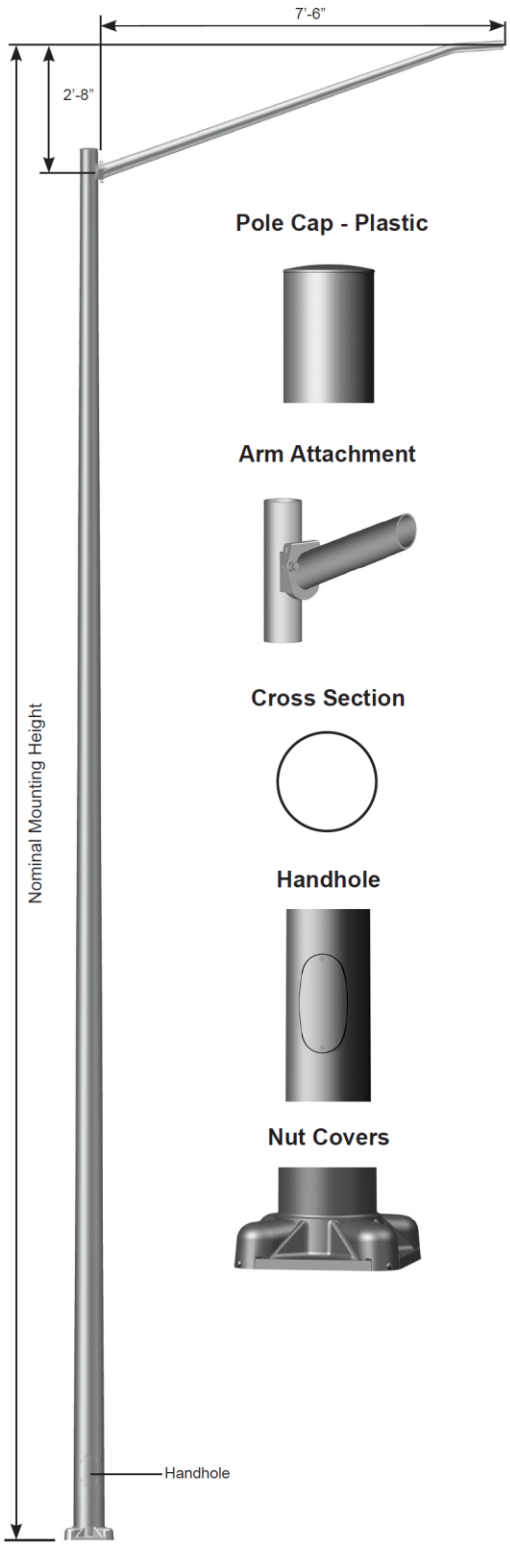
Type S4D: 96L 395

Type S4E: 96L 315

BEACON design . performance . technology

DELIVERED LUMENS

# of LEDs	DRIVE CURRENT (mA)	SYSTEM WATTS	DISTRIBUTION TYPE	5K (5000K nominal, 70 CRI)					4K (4000K nominal, 70 CRI)					3K (3000K nominal, 70 CRI)				
				LUMENS	LPW[1]	B	U	G	LUMENS	LPW[1]	B	U	G	LUMENS	LPW[1]	B	U	G
96	1000mA	315W[2]	1A	35666	113	3	0	2	36769	117	3	0	2	31989	101	2	0	2
			2	33725	107	3	0	4	34768	110	3	0	4	30248	96	3	0	4
			3	33782	107	3	0	5	34827	110	3	0	5	30299	96	3	0	4
			4	33012	105	2	0	5	34033	108	2	0	5	29609	94	2	0	5
			4W	29571	94	3	0	5	30485	97	3	0	5	25913	82	2	0	5
			5QM	33785	107	5	0	3	34830	110	5	0	3	30302	96	5	0	2
			5QN	35280	112	5	0	1	36371	115	5	0	1	31643	100	5	0	1
			5R	34080	108	5	0	5	35134	111	5	0	5	30567	97	5	0	5
			5W	32302	102	5	0	4	33301	106	5	0	4	28972	92	5	0	4
			TC	30568	97	2	1	3	31513	100	3	1	3	27416	87	2	1	3
96	1225mA	395W[2]	1A	39569	101	3	0	4	43125	110	3	0	3	37518	96	3	0	2
			2	39569	101	3	0	4	40793	104	3	0	4	35490	91	3	0	4
			3	39619	101	3	0	5	40845	104	3	0	5	35535	91	3	0	5
			4	38723	98	3	0	5	39921	101	3	0	5	34731	88	2	0	5
			4W	34691	86	3	0	5	35764	89	3	0	5	30400	76	3	0	5
			5QM	39623	101	5	0	3	40848	104	5	0	3	35538	90	5	0	3
			5QN	41394	105	5	0	1	42675	109	5	0	1	37127	95	5	0	1
			5R	39969	102	5	0	5	41205	105	5	0	5	35848	91	5	0	5
			5W	37877	97	5	0	4	39048	100	5	0	4	33986	87	5	0	4
			TC	35850	90	3	1	3	36959	93	3	1	3	32154	81	3	1	3



Pole Cap - Plastic

Arm Attachment

Cross Section

Handhole

Nut Covers

SPECIFICATIONS

Pole - The pole shaft is extruded from seamless alloy aluminum.

Pole Top - A removable pole cap is provided.

Luminaire Arm - Luminaire arms are conically tapered from seamless alloy aluminum to 2.38" OD at the luminaire end.

Luminaire Arm Attachment - Connection allows arm to be erected and held in place by gravity and secured by two bolts.

Handhole - A covered handhole with hardware and grounding provision are provided.

Base Cover - Optional decorative base covers available as special order.

Anchor Base - The anchor base is cast from 356 alloy aluminum. The completed assembly is heat-treated to a T6 temper. Aluminum nut covers are included with anchor base unless otherwise specified.

Anchor Bolts - Anchor bolts conform to ASTM F1554 Grade 55 and are provided with two hex nuts and two flat washers. Bolts have an "L" bend on one end and are galvanized a minimum of 12" on the threaded end.

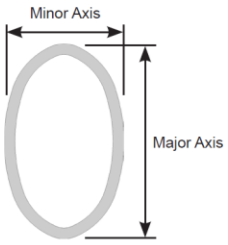
Hardware - All structural and non-structural fasteners are stainless steel.

Finish - The standard finish for the pole assembly and components is satin brushed, natural anodize, duranodic or polyester powder applied coating in accordance with Valmont's Specifications. Additional finish options available upon request.

Design Criteria - Please reference Design Criteria Specification for appropriate design conditions.

ARM DATA

Ovalized Arm Cross Section



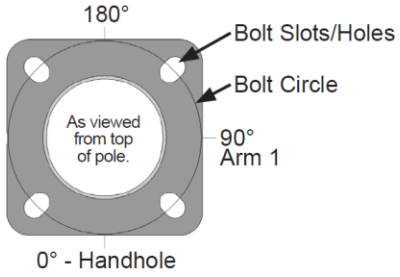
(*rev. 05/11/20*)

valmont STRUCTURES

ANCHORAGE DATA

POLE		BASE PLATE				ANCHOR BOLTS		
BASE OD (IN)	WALL THK (IN)	BOLT CIRCLE DIA (IN)	BOLT CIRCLE ± (IN)	SQUARE (IN)	THK (IN)	DIA x LENGTH x HOOK (IN)	PROJECTION (IN)	± (IN)
6.00	0.156	9.50	0.75	10.32	0.630	0.75 x 17.00 x 3.00	3.50	N/A
6.00	0.188	9.50	0.75	10.32	0.630	0.75 x 17.00 x 3.00	3.50	N/A
7.00	0.156	10.56	0.43	11.26	0.750	1.00 x 36.00 x 4.00	4.13	N/A
8.00	0.156	11.63	0.37	12.05	0.750	1.00 x 36.00 x 4.00	4.13	N/A
8.00	0.188	11.63	0.37	12.05	0.750	1.00 x 36.00 x 4.00	4.13	N/A
8.00	0.250	11.63	0.37	12.05	0.750	1.00 x 36.00 x 4.00	4.13	N/A
9.00	0.156	13.25	0.75	12.48	1.250	1.00 x 36.00 x 4.00	4.13	N/A
9.00	0.188	13.25	0.75	12.48	1.250	1.00 x 36.00 x 4.00	4.13	N/A

Anchor Base Detail



LOAD AND DIMENSIONAL DATA

DESIGN INFORMATION							POLE DIMENSIONS					
NOMINAL MOUNTING HEIGHT	MAX WEIGHT[1] (LBS)	70 MPH w/1.3 GUST MAX EPA[1] (SQ FT)	80 MPH w/1.3 GUST MAX EPA[1] (SQ FT)	90 MPH w/1.3 GUST MAX EPA[1] (SQ FT)	100 MPH w/1.3 GUST MAX EPA[1] (SQ FT)	110 MPH w/1.3 GUST MAX EPA[1] (SQ FT)	POLE HEIGHT	BASE OD (IN)	TOP OD (IN)	WALL THK (IN)	STRUCTURE WEIGHT[2] (LBS)	MODEL NUMBER
20'-0"	65	4.5	3.2	2.4	1.7	1.3	17'-8"	6.00	4.00	0.156	72	1MA0832S-170840605T4
25'-0"	50	4.5	3.2	1.9	0.8	N/A	22'-8"	6.00	4.00	0.156	86	1MA0832S-220840605T4
	60	4.5	3.2	2.4	1.7	1.0	22'-8"	6.00	4.00	0.188	98	1MA0832S-220840606T4
	65	4.5	3.2	2.4	1.7	1.3	22'-8"	7.00	4.00	0.156	94	1MA0832S-220840705T4
30'-0"	50	4.5	3.2	2.0	0.8	N/A	27'-8"	7.00	4.00	0.156	110	+1MA0832S-270840705T4
	75	4.5	3.2	2.4	1.7	1.3	27'-8"	8.00	4.50	0.156	123	1MA0832S-270845805T4
35'-0"	70	4.5	3.2	2.1	0.9	N/A	32'-8"	8.00	4.50	0.156	142	+1MA0832S-320845805T4
	75	4.5	3.2	2.4	1.7	1.2	32'-8"	8.00	4.50	0.188	166	1MA0832S-320845806T4
	75	4.5	3.2	2.4	1.7	1.3	32'-8"	8.00	4.50	0.250	211	1MA0832S-320845808T4
	75	4.5	3.2	2.4	1.7	1.3	32'-8"	9.00	4.50	0.156	157	+1MA0832S-320845905T4
	75	4.5	3.2	2.4	1.7	1.3	32'-8"	9.00	4.50	0.188	183	1MA0832S-320845906T4
39'-0"	75	4.5	3.2	1.9	0.7	N/A	36'-8"	8.00	4.50	0.188	188	+1MA0832S-360845806T4
	75	4.5	3.2	2.4	1.2	N/A	36'-8"	9.00	4.50	0.156	178	+1MA0832S-360845905T4
	75	4.5	3.2	2.4	1.7	1.3	36'-8"	8.00	4.50	0.250	239	1MA0832S-360845808T4
	75	4.5	3.2	2.4	1.7	1.3	36'-8"	9.00	4.50	0.188	207	+1MA0832S-360845906T4

1. EPA represents the Effective Projected Area of each luminaire. Designs are limited to one luminaire per arm. Variations from sizes above are available upon inquiry at the factory. Satisfactory performance of poles is dependent upon the pole being properly attached to a supporting foundation of adequate design.
2. Structure weight is a nominal value which includes the pole shaft, base plate and luminaire arm(s).
+ Pole includes factory installed vibration damper.

PRODUCT ORDERING CODES

CROSS SECTION	MODEL NUMBER	COLOR		OPTIONS
R			_	
R = Round	1MA0832S-170840605T4 1MA0832S-220840605T4 1MA0832S-220840606T4 1MA0832S-220840705T4 +1MA0832S-270840705T4 1MA0832S-270845805T4 +1MA0832S-320845805T4 1MA0832S-320845806T4	**Polyester Powder** DWH = White DSS = Sandstone BR = Burgundy HG = Hunter Green DNA = Natural Aluminum DCG = Charcoal Gray DMB = Medium Bronze	**Anodized** 204 = Clear Natural 311 = Light Bronze* 312 = Medium Bronze* 313 = Dark Bronze* 335 = Black* *Duranodic Anodize	See Accessories at valmontstructures.com (Please Specify with Code)

Type S4D & Type S4E: 30-Foot Pole with 48-Inches Exposed Concrete Foundation Base

valmont STRUCTURES

1. ALL PROPOSED LIGHTS HAVE "CUT-OFF" OPTICS.

2. PROPOSED LIGHTING FIXTURES:

TYPE S1A: BEACON LIGHTING # SRT1-20-3K8-SQW-UNV-GYS-CD-SRT1WG
DOWNLIGHT MOUNTED ON UNDERSIDE OF CANOPY

TYPE S2A: BEACON LIGHTING # SG1-20-3K7-FT-UNV-GYS-SCP-20F
WALL LIGHT MOUNTED AT 3-FEET ABOVE PERSONNEL DOORS; AND AT 16-FEET ABOVE GRADE AT THE TRANSFORMER/GENERATOR YARD

TYPE S2B: KIM LIGHTING # WDM-D-48L-85-3K7-FTD-UNV
WALL LIGHT MOUNTED AT 30 FEET ABOVE GRADE

TYPE S3A: NOT USED

TYPE S4A: BEACON LIGHTING # VPS-24L-55-3K7-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
BEACON LIGHTING # SB1-24"-PT20-GYS (BRACKET ARM)
BEACON LIGHTING # RTA-B-18-50-A-TA-XX-GYS-VMZ (POLE)
AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN AND WITH 24-INCH BRACKET ARM MOUNTED ON A 18-FOOT TALL TAPERED ALUMINUM POLE WITH A 6-INCH EXPOSED CONCRETE FOUNDATION BASE LUMINAIRE TO BE DIMMED AT 50% LIGHT OUTPUT

TYPE S4B: NOT USED

TYPE S4C: BEACON LIGHTING # VPS-24L-55-3K7-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
BEACON LIGHTING # SB1-24"-PT20-GYS (BRACKET ARM)
BEACON LIGHTING # RTA-B-16-50-A-TA-XX-GYS-VMZ (POLE)
AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN AND WITH 30-INCH BRACKET ARM MOUNTED ON A 16-FOOT TALL TAPERED ALUMINUM POLE WITH A 30-INCH EXPOSED CONCRETE FOUNDATION BASE LUMINAIRE TO BE DIMMED AT 70% LIGHT OUTPUT

TYPE S4D: BEACON LIGHTING # VPL-96L-395-3K7-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
VALMONT LIGHTING # R-1MA0832S-270845805T4-DNA-204 (POLE AND ARM)
AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN MOUNTED ON A 30-FOOT TALL TAPERED ALUMINUM WITH AN ATTACHED 8-FOOT BRACKET ARM AND WITH A 48-INCH EXPOSED CONCRETE FOUNDATION BASE

TYPE S4E: BEACON LIGHTING # VPL-96L-315-3K7-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
VALMONT LIGHTING # R-1MA0832S-270845805T4-DNA-204 (POLE AND ARM)
AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN MOUNTED ON A 30-FOOT TALL TAPERED ALUMINUM WITH AN ATTACHED 8-FOOT BRACKET ARM AND WITH A 48-INCH EXPOSED CONCRETE FOUNDATION BASE

3. ALL PROPOSED LIGHTING FIXTURES UTILIZE 3K LED LAMPS.

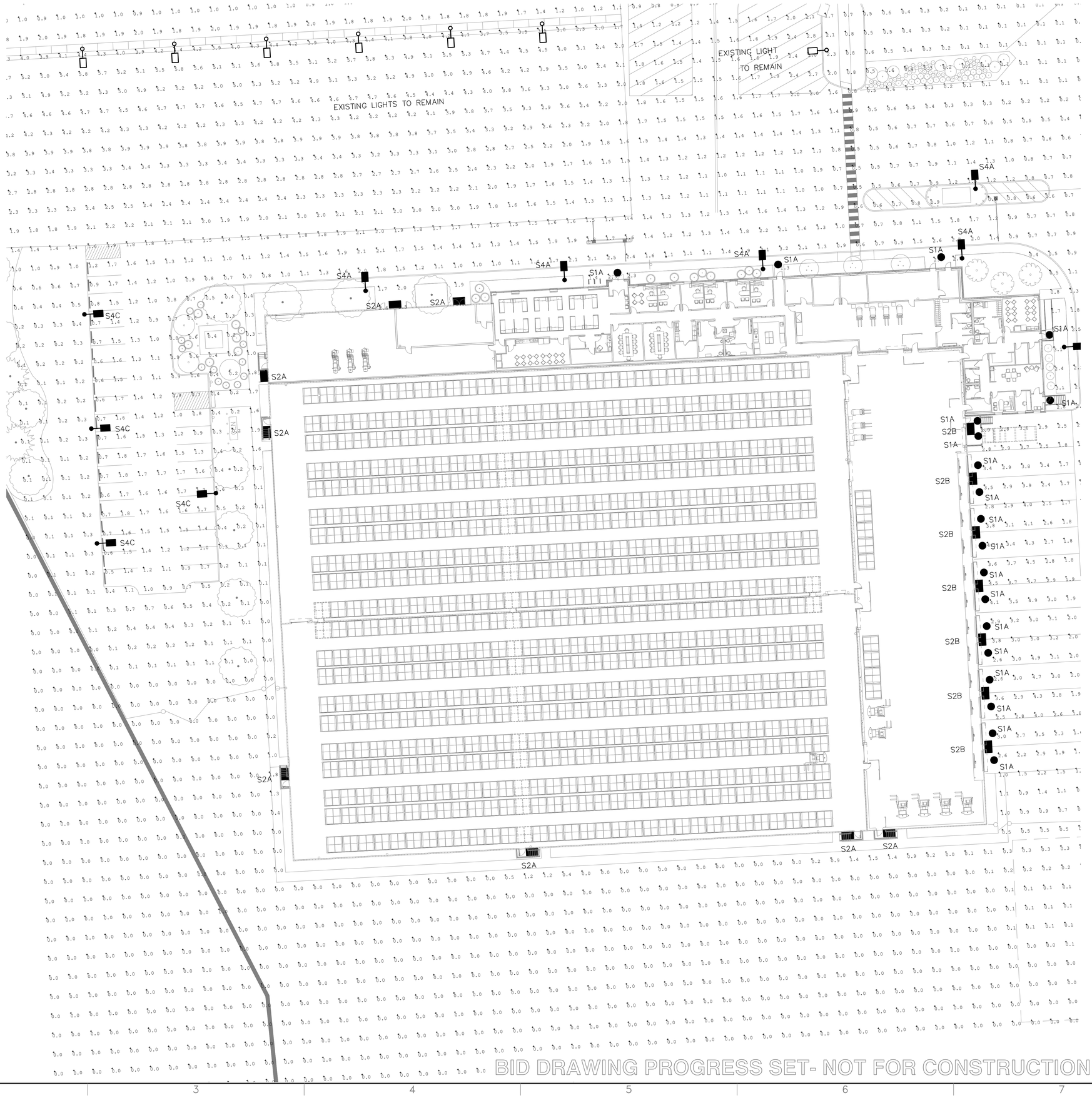
TYPE S1A:	21.6 WATTS	2,846 LUMENS
TYPE S2A:	21.0 WATTS	1,424 LUMENS
TYPE S2B:	88.0 WATTS	9,643 LUMENS (6,268 LUMENS)* *ALL TO BE DIMMED TO 65% OUTPUT
TYPE S4A:	55.0 WATTS	5,272 LUMENS (2,636 LUMENS)* *DRIVE LIGHTS TO BE DIMMED TO 50% OUTPUT
TYPE S4C:	55.0 WATTS	5,272 LUMENS (3,690 LUMENS)* *PARKING LOT LIGHTS TO BE DIMMED TO 70% OUTPUT
TYPE S4D:	395 WATTS	30,400 LUMENS
TYPE S4E:	315 WATTS	25,913 LUMENS

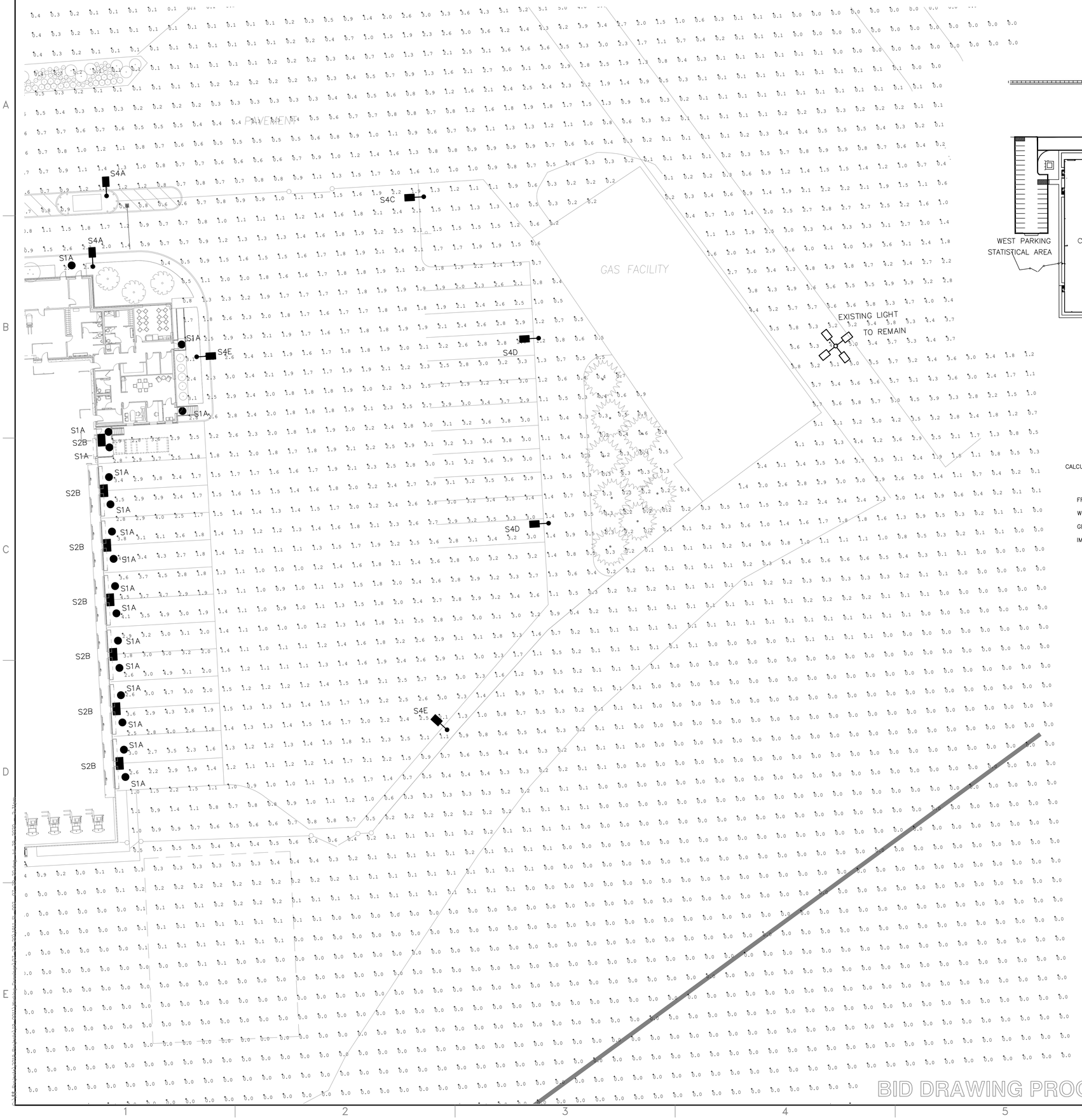
4. EXTERIOR LIGHTS WILL OPERATE CONTINUOUSLY DUSK-TO-DAWN (CONTROLLED BY PHOTOCELL) TO FACILITATE 24-HOUR OPERATIONS.

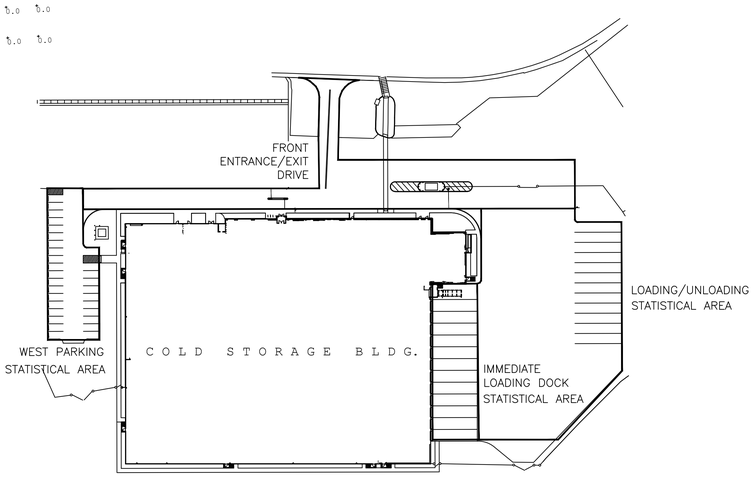
ILLUMINANCE LEVELS INDICATED IN FOOTCANDLES AT GRADE

20' 0 20' 40'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING


EXISTING LIGHTS TO REMAIN
EXISTING LIGHT TO REMAIN
S1A
S1A
S1A





KEY PLAN

CALCULATED ILLUMINANCE RESULTS (FOOTCANDLES AT GRADE):

	AVE.	MAX.	MIN.	AVE–TO–MIN UNIFORMITY	MAX–TO–MIN UNIFORMITY
FRONT ENTRANCE/EXIT DRIVE:	1.2 FC	3.2 FC	0.5 FC	2.5–TO–1	6.4–TO–1
WEST PARKING LOT:	1.2 FC	1.8 FC	0.5 FC	2.4–TO–1	3.6–TO–1
GENERAL LOADING/UNLOADING AREA:	2.1 FC	3.9 FC	0.9 FC	2.4–TO–1	4.3–TO–1
IMMEDIATE LOADING DOCK AREA:	2.7 FC	5.0 FC	1.0 FC	2.7–TO–1	5.0–TO–1

ILLUMINANCE LEVELS INDICATED IN FOOTCANDLES AT GRADE

20' 0 20' 40'

BAR SCALE
1" = 20'

CHECK GRAPHIC SCALE BEFORE USING

BID DRAWING PROGRESS SET-NOT FOR CONSTRUCTION

WOODARD & CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
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STATE OF MAINE · LAWRENCE E. BARTLETT No. 7926 · REGISTERED PROFESSIONAL ENGINEER
Lawrence E. Bartlett 7/29/20

REV	DESCRIPTION	DATE

CHECKED BY:

REV	DESCRIPTION	DATE
1	REVISED SITE LIGHTING	07/29/20

DESIGNED BY: LEB DRAWN BY: LEB

SITE LIGHTING ILLUMINANCE CALCULATION PLAN - PART 2

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: JULY, 2020
SCALE: 1"=20'-0"
SHEET: # OF XX

SL-002

WEST COMMERCIAL STREET
U.S. ROUTE 1A

EXISTING LIGHTS TO REMAIN

EXISTING LIGHT TO REMAIN

EXISTING LIGHT TO REMAIN

PAVEMENT

ROUTE UNDERGROUND WIRING FOR TYPE S4A POLE LIGHTING BELOW SIDEWALK TO AVOID FIRE HYDRANT

FIRE HYDRANT

GAS FACILITY

LIGHTING CONTROL PANEL LCP1 277/480V

LIGHTING CONTROL PANEL ELCP1 277/480V

LIGHTING CONTROL PANEL LCP2 277/480V

LCP1 # A

LCP2 # C

LCP2 # D

ELCP1 # A

S4A

S4C

S4D

S4E

S2A

S2B

S1A

CONNECT TYPE S1A LIGHTS AT THE LOADING DOCK TO LIGHTING CONTROL PANEL LCP2 # A

CONNECT TYPE S2B LIGHTS AT THE LOADING DOCK TO LIGHTING CONTROL PANEL LCP2 # B

DISCONNECT AND REMOVE EXISTING CONDUIT AND WIRING (NOTE 1)

INSTALL CENTER OF TYPES S4D AND S4E LIGHTING POLE BASES 24 INCHES FROM EDGE OF PAVEMENT

EXISTING LIGHT (NOTE 1)

SUBSURFCE STORM WATER SYSTEM

1. WHERE INDICATED, DISCONNECT AND REMOVE THE EXISTING LIGHTING POLE AND CONCRETE FOUNDATION BASE. ALSO REMOVE THE EXISTING UNDERGROUND CONDUIT AND WIRING CONDUCTORS. RETURN THE LIGHTING POLE AND LUMINAIRE IN WORKING CONDITION TO THE OWNER.
2. PROVIDE UNDERGROUND WIRING TO EXTERIOR POLE LIGHTS CONSISTING OF 2#10, PLUS 2#12 CONTROL (PURPLE & GRAY), PLUS 1#12GROUND CONDUCTORS, ALL IN A 1-1/4 INCH CONDUIT. INSTALL POLE LIGHTING CIRCUIT CONDUITS 30-INCHES BELOW GRADE IN SCHEDULE 40 PVC CONDUIT.
3. PROVIDE CIRCUIT WIRING FOR BUILDING MOUNTED LIGHTS CONSISTING OF 2#12, PLUS 2#12 CONTROL (PURPLE & GRAY), PLUS 1#12GROUND IN A 3/4 INCH EMT CONDUIT. ROUTE CONDUITS INSIDE BUILDING.
4. CIRCUITS FOR POLE LIGHTS AND BUILDING MOUNTED LIGHTS SHALL BE EXTENDED THROUGH DIGITAL, PROGRAMMABLE LIGHTING CONTROL PANELS WITHIN THE BUILDING. PROVIDE A 0-10 VOLT LED COMPATIBLE DIMMER SWITCH FOR EACH LIGHTING CIRCUIT. INSTALL DIMMER SWITCHES BESIDE LIGHTING CONTROL PANELS.
5. COORDINATE EXACT LICATION OF ALL BUILDING MOUNTED EXTERIOR LIGHTS WITH ARCHITECT PRIOR TO ROUGH-IN.

ILLUMINANCE LEVELS INDICATED IN FOOTCANDLES AT GRADE

30' 0 30' 60'

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

ISSUED FOR BID-NOT FOR CONSTRUCTION

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REV	DESCRIPTION	DATE
3	REVISED ISSUE FOR BID	07/29/20
2	REVISED PER COMMENTS	04/21/20
1	REVISED LUMINAIRE LOCATIONS	02/27/20
REV	DESCRIPTION	DATE

DESIGNED BY: LEB | DRAWN BY: LEB | CHECKED BY: | 180 SAW 07-29-20.dwg

SITE LIGHTING PLAN

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: JULY, 2020
SCALE: 1"=30'-0"
SHEET: # OF XX

SL-100

C:\$$ Projects\2019 Projects\19-0011\Working Drawings\07-29-20\911 SL100 07-29-20.dwg, Jul 29, 2020 - 2:34pm

4. EVIDENCE OF RIGHT, TITLE AND INTEREST

As noted on the survey, the Cold Storage Facility will be located on a parcel of land currently owned by the Maine Port Authority. A copy of the deed and the Option to Ground Lease Agreement, which serves as evidence of right, title, and interest, has been attached to this Section.

4.1 ATTACHMENTS

- Deed of Convenience, dated March 11, 2020, Cumberland County Registry of Deeds, Book 36501, Pg 146.
- Option to Ground Lease Agreement, dated March 12, 2020, between Maine Port Authority and Maine International Cold Storage Facility LLC.

DEED OF CONVENIENCE

The **STATE OF MAINE**, acting by and through its **DEPARTMENT OF TRANSPORTATION** (the "Grantor" or "MaineDOT"), under and pursuant to the provisions of 23 M.R.S. § 4424, for consideration, hereby **TRANSFERS** all its right, title and interest in and to land and rights in land situated on the southerly side of West Commercial Street in the City of Portland, County of Cumberland, State of Maine, as further described herein to **THE MAINE PORT AUTHORITY**, a body both corporate and politic in the State of Maine (the "Grantee" or "MPA"), having a mailing address of 460 Commercial Street, Portland, Maine 04101.

Said property (the "Premises") is more particularly described in the attached **Exhibit A Legal Description** and shown on the attached **Exhibit B Plans**, being copies of the following MaineDOT Right of Way Maps:

A. Plan entitled "State of Maine Department of Transportation Right of Way Map, Land Acquisition Plan Part II, West Commercial Street, Portland, Cumberland County, Maine" dated April 25, 2014 and recorded in Plan Book 219, Page 37 of the Cumberland County Registry of Deeds, and being further identified in MaineDOT's records as D.O.T. File No. 3-596.

B. Plan entitled "State of Maine Department of Transportation Right of Way Map, Land Acquisitions, West Commercial Street, Portland, Cumberland County, Maine" dated April 2014, revised March 9, 2020 and recorded in Plan Book 220, Page 63 of said Registry of Deeds and being further identified in MaineDOT's records as D.O.T. File No. 3-595.

The Premises are conveyed **SUBJECT TO** the following:

1. All easements and encumbrances of record;

2. All Certificates of Completion, all recorded covenants and restrictions, and all conditions and protections affecting the Premises as set forth in the records of the Maine Department of Environmental Protection's ("DEP") Voluntary Response Action Program ("VRAP") referencing the former Portland Gas Works site. Recorded covenants and restrictions encumbering the property include the following:

   a. Declaration of Environmental Covenant dated May 24, 2015 and recorded in Book 32334, Page 6 of said Registry of Deeds;

   b. Declaration of Environmental Covenant dated September 18, 2019 and recorded in Book 36025, Page 267 of said Registry of Deeds; and

   c. Declaration of Environmental Covenant dated September 18, 2019 and recorded in Book 36025, Page 291 of said Registry of Deeds.

3. The condition subsequent that, in the event MPA no longer uses the Premises for port-related transportation purposes, MaineDOT shall have the right, upon sixty (60) days prior written notice, to reenter and retake the Premises, and MPA shall surrender

the same and execute any documentation that MaineDOT reasonably requires to evidence the vesting of fee simple title in Maine DOT.

4. The condition that MPA shall not convey the Premises, or any portion thereof, to a third party without obtaining MaineDOT's prior written permission, which shall be granted at MaineDOT's sole discretion.

5. The terms of an existing Easement Agreement between MaineDOT and Northern Utilities, Inc. d/b/a Unitil dated December 15, 2016 and recorded in Book 33716, Page 257 of said Registry of Deeds.

6. All utility easements and installations of record and located on the Premises and to those rights that any utility enjoys over the Premises for maintenance, location or relocation of poles and other installations.

The Grantor makes no representations or warranties with respect to the Premises conveyed. The representations and warranties so excluded encompass, but are not limited to, those pertaining to: land use and environmental matters; fitness of the Premises or any portion thereof for any particular purpose; water quality or quantity; the condition or quality of the soil; inchoate or unrecorded liens; or the existence, status, or condition of access to, or public utilities serving the Premises. Any subsequent use of, improvement to, or construction on the parcel is subject to all applicable laws, regulations, ordinances, and permitting requirements.

IN WITNESS WHEREOF, the said State of Maine, acting by and through its Department of Transportation, has caused this instrument to be executed by Bruce A. Van Note, its Commissioner, thereunto duly authorized this 11th day of March in the year two thousand twenty.

STATE OF MAINE
Department of Transportation

Bruce A. Van Note, Commissioner

STATE OF MAINE
County of Kennebec

March 11, 2020

Personally appeared the above-named Bruce A. Van Note, Commissioner of the Maine Department of Transportation, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the State of Maine.

Before me,

Shelly Wood

Notary Public/Attorney at Law
Print name:
My commission expires:

SHELLY WOOD
NOTARY PUBLIC
KENNEBEC COUNTY
MAINE
MY COMMISSION EXPIRES DECEMBER 26, 2025

SEAL

Deed of Convenience
MaineDOT to Maine Port Authority
Portland, Maine

EXHIBIT A
Legal Description

THREE CERTAIN PARCELS OF LAND, together with any improvements held by the Grantor thereon and not otherwise excepted or excluded herein, situated on the southerly side of West Commercial Street in the City of Portland, County of Cumberland and State of Maine described as follows (the "Premises") and depicted on the attached **Exhibit B Plans** (the "Right of Way Maps"):

PARCEL ONE:
All land, and rights in land located within the following described boundaries:

COMMENCING at a granite monument found in a manhole located in the southerly sideline of West Commercial Street about 393' northerly of the intersection of the said West Commercial Street and Clark Street, as shown on said Right of Way Map;

THENCE S 32°36'10" W along the southerly sideline of West Commercial Street 86.09 feet to the ***point of beginning***, said point being the northeasterly corner of property conveyed by Portland Terminal Company to New Yard, LLC by deed dated July 31, 2013 and recorded in Book 30887, Page 247 of the Cumberland County Registry of Deeds;

THENCE from said point of beginning S 32°31'38" E along the westerly line of land now or formerly of the City of Portland 580 feet, more or less to mean low water;

THENCE westerly and southwesterly along mean low water 64 feet, more or less, to a point on the easterly line of land now or formerly of Casco Wharf & Storage as described in Book 1507, Page 126 of said Registry of Deeds (which is a part of the parcel herein described);

THENCE S 32°31'38" E along said easterly line of said Casco Wharf & Storage 50 feet more or less to the Former Harbor Commissioner's Line of 1929;

THENCE S 37°45'10"W along said Harbor Commissioner's Line 600 feet, more or less to a point;

THENCE S 62°18'00" W along said Harbor Commissioner's Line 400 feet, more or less, to a point;

THENCE S 78°39'00" W along said Harbor Commissioner's Line 117 feet, more or less, to the southerly corner of a parcel shown on said Right of Way Map as "Parcel 5";

THENCE N 21°46'06" W 60 feet, more or less, to the mean low water line as shown on said Right of Way Map;

THENCE continuing N 21°46'06" W 105 feet, more or less, through land now or formerly of New Yard, LLC to the southerly corner of a parcel of land formerly owned by Northern Utilities, Inc., d/b/a Until;

THENCE N 43°25'17" W along the westerly boundary of said land formerly of said Northern Utilities (which is a part of the parcel herein described) and the easterly boundary of land now or formerly of said New Yard, LLC 435.50 feet to the northwest corner of said former Northern Utilities parcel and a point that represents the northeast corner of said land now or formerly of said New Yard, LLC;

THENCE S 70°47'58" W along the northerly boundary of said land now or formerly of said New Yard, LLC 381.52 feet to land formerly of Portland Terminal Company and Maine Central Railroad Company and now of the State of Maine as described in a Notice of Condemnation recorded in Book 31408, Page 301 of said Registry of Deeds (said land now of the State of Maine being Parcel Two described herein);

THENCE N 16°58'37" W along land of the State of Maine and now or formerly owned by Portland Terminal Company and Maine Central Railroad Company 149.35 feet to the southerly side of West Commercial Street;

THENCE N 73°01'23" E along the southerly sideline of said West Commercial Street 1053.20 feet to a point;

THENCE N 32°36'10"E along the southerly sideline of said West Commercial Street 551.51 feet to the **point of beginning.**

The above described parcel contains 18 acres, more or less.

EXCEPTING FROM THE ABOVE DESCRIBED PARCEL any existing gas facilities, including without limitation, natural gas and propane pipelines, buildings, associated fixtures and related appurtenances, improvements and other personal property that are owned by or are in the custody and control of Northern Utilities, Inc., d/b/a Unitil.

MEANING AND INTENDING TO CONVEY all rights acquired by the Grantor through the following:

a. Notice of Condemnation filed in said Registry of Deeds on April 30, 2014 in Book 31470, Page 191 of said Registry of Deeds; and

b. Notice of Condemnation filed in said Registry of Deeds on May 11, 2016 in Book 33101, Page 252 of said Registry of Deeds

PARCEL TWO:

All land and rights in land within the following described boundaries:

COMMENCING at a point on the southerly sideline of West Commercial Street at the northwesterly corner of land now or formerly of New Yard, LLC recorded in the Cumberland County Registry of Deeds in Book 30887, Page 247;

THENCE, S 16°58'37" E along the westerly line of land of said New Yard, LLC 90.30 feet to the **point of beginning**;

THENCE from said point of beginning S 16°58'37" E continuing along the westerly line of land of New Yard, LLC 67.90 feet;

THENCE the following courses and distances through land of Maine Central Railroad Company:

S 66°19'39" W for a distance of 57.45 feet;
S 62°41'27" W for a distance of 125.13 feet;
S 59°26'10" W for a distance of 495.19 feet;

THENCE, along a curve to the right with a radius of 725.74 feet, having an arc length of 165.42 feet, having a chord bearing of S 65°57'58" W and chord length of 165.07 feet;

THENCE, S 72°29'45" W for a distance of 519.07 feet;

THENCE, along a curve to the right with a radius of 725.78 feet, having an arc length of 185.34 feet, having a chord bearing of S 79°48'41" W and chord length of 184.84 feet;

THENCE, S 87°07'38" W for a distance of 21.45 feet to a point;

THENCE, S 02°52'22" E for a distance of 26 feet, more or less, to the spring high tide line;

THENCE, generally westerly along the spring high tide line 1316 feet, more or less, to land now or formerly of Cianbro Corp. recorded in said Registry of Deeds in Book 3424, Page 116, being on a bearing of S 74°55'10"W a distance of 1075.68 feet from the last mentioned point;

THENCE, the following courses and distances along land of said Cianbro Corp.:

N 16°59'42" W for a distance of 171.32 feet;
S 79°48'18" W for a distance of 347.84 feet;

N 16°59'42"W for a distance of 53.00 feet to the southerly sideline of Cassidy Point Road;

THENCE, N 73°00'18" E along the southerly sideline of Cassidy Point Road 263.93 feet to the southerly sideline of West Commercial Street;

THENCE, N 82°56'03" E continuing along the southerly sideline of West Commercial Street 543.92 feet to an angle point;

THENCE, N 77°41'31" E continuing along the southerly sideline of West Commercial Street 16.88 feet;

THENCE, the following courses and distances through land of Maine Central Railroad Company:

N 84°41'57" E for a distance of 219.48 feet;
N 86°01'33" E for a distance of 312.82 feet;
N 87°07'38" E for a distance of 273.21 feet;
N 72°29'45" E for a distance of 542.24 feet;

THENCE, along a curve to the left with a radius of 673.74 feet, having an arc length of 153.57 feet, having a chord bearing of N 65°57'58" E and chord length of 153.24 feet;

THENCE, N 59°26'10"E a distance of 693.10 feet to the point of beginning.

The above described parcel contains 5.0 acres, more or less.

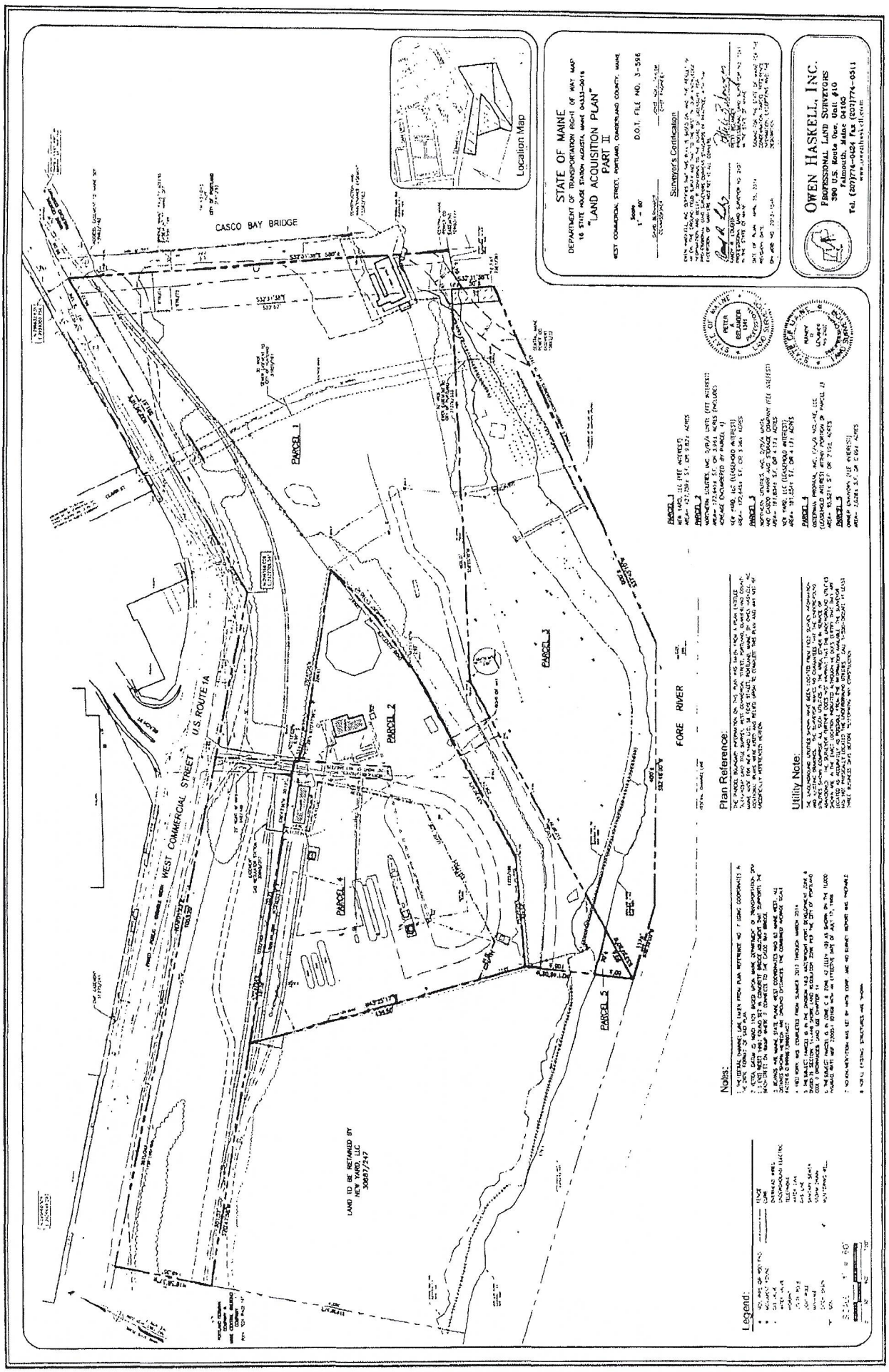
EXCEPTING FROM THE ABOVE DESCRIBED PARCEL the premises conveyed by the State of Maine to Cianbro Corporation by Governor's Deed dated January 8, 2015 and recorded in Book 32199, Page 285 of said Registry of Deeds containing 5780 square feet, more or less.

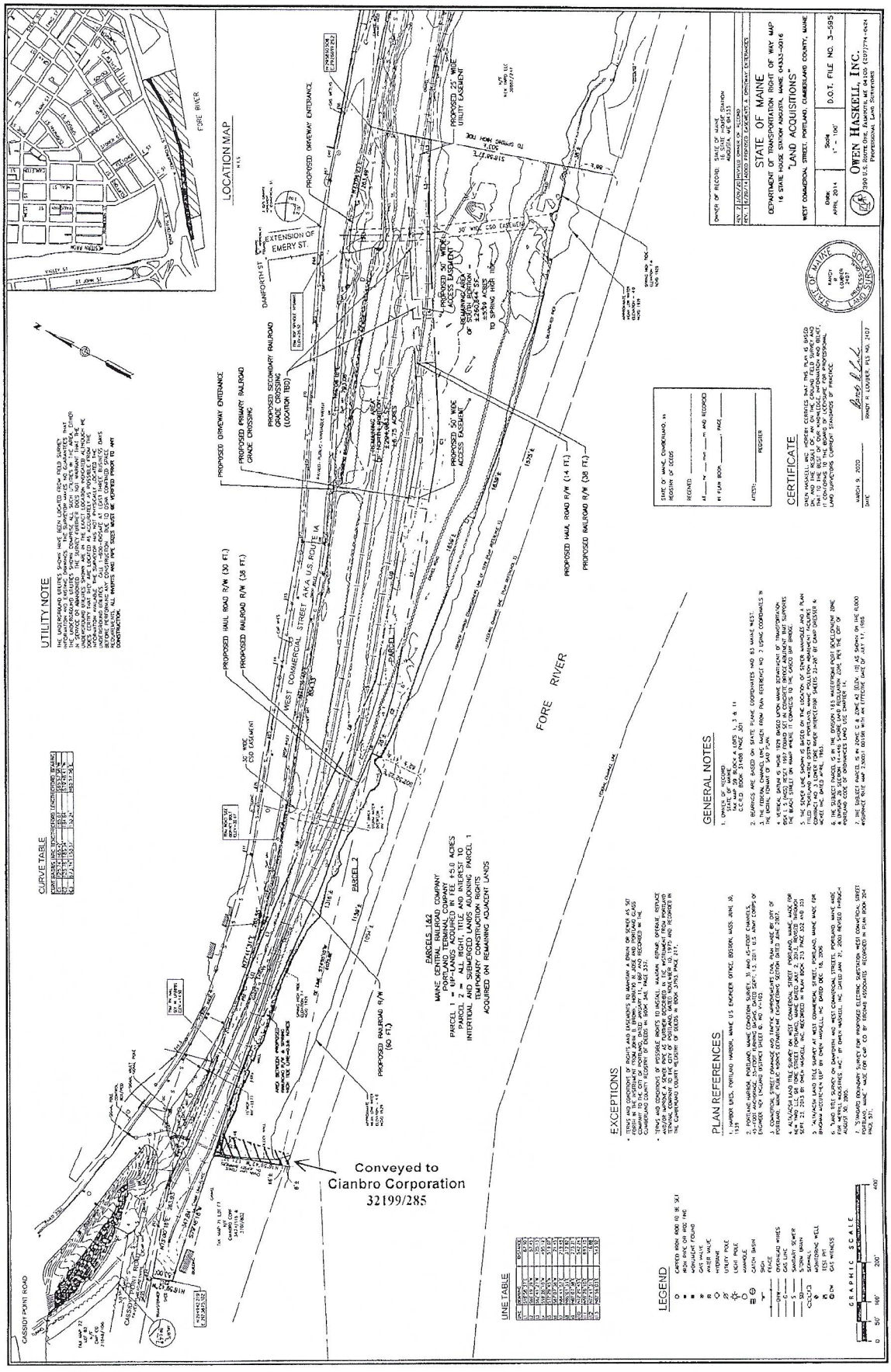
MEANING AND INTENDING TO CONVEY all rights acquired by the Grantor through its Notice of Condemnation filed in said Registry of Deeds on March 27, 2014 in Book 31408, Page 301 of said Registry of Deeds, excepting the aforementioned premises conveyed to Cianbro Corporation in Book 32199, Page 285.

PARCEL THREE:

All right, title and interest in and to the intertidal and submerged lands adjoining the parcels described above and located between the spring high tide line and the Former Harbor Commissioner's Line of 1929 as shown on said Right of Way Maps and acquired by the Grantor by virtue of the above-referenced Notices of Condemnation, to the extent that such rights are not otherwise excepted herefrom.

EXHIBIT B
Plans
(see following two pages)


STATE OF MAINE
DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP
16 STATE HOUSE STATION AUGUSTA, MAINE 04333-0016
"LAND ACQUISITION PLAN"
PART II
WEST COMMERCIAL STREET, PORTLAND, CUMBERLAND COUNTY, MAINE
Scale 1" = 80'
D.O.T. FILE NO. 3-586
Surveyor's Certification
OWEN HASKELL, INC.
PROFESSIONAL LAND SURVEYORS
390 U.S. Route One, Suite #10
Falmouth, Maine 04105
Tel. (207)774-0424 Fax (207)774-0511
www.owenhaskell.com
Location Map
CASCO BAY BRIDGE
WEST COMMERCIAL STREET
U.S. ROUTE 1A
FORE RIVER
PARCEL 1
PARCEL 2
PARCEL 3
PARCEL 4
PARCEL 5
LAND TO BE RETAINED BY NEW YARD, LLC 30661/247
Notes:
Plan Reference:
Utility Note:
Legend:



Received
Recorded Register of Deeds
Mar 12,2020 08:21:19A
Cumberland County
Nancy A. Lane

OPTION TO GROUND LEASE AGREEMENT

This OPTION TO GROUND LEASE AGREEMENT (this "**Agreement**") is entered into as of the Effective Date by and between Owner and Optionee. In consideration of the mutual promises of the parties herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Optionee and Owner hereby agree as follows:

BASIC OPTION PROVISIONS

EFFECTIVE DATE	March 12, 2020.
OWNER	The Maine Port Authority, a State of Maine "body both corporate and politic," a quasi-governmental entity created under Maine Statute at 23 M.R.S. §§ 4420-4430.
OPTIONEE	Maine International Cold Storage Facility LLC, a limited liability company.
PROPERTY	That real property consisting of the parcel(s) located in the City/Town of Portland, County of Cumberland, State of Maine, as more particularly depicted in **Exhibit A**, together with any improvements located thereon and rights, benefits and easements appurtenant to the parcel(s).
LAND	The Land is co-extensive with the Property (see Exhibit A).
OPTION PERIOD	Three (3) months from the Effective Date, which Optionee may extend for an additional period of three (3) months pursuant to Section 2(a).
OPTION PAYMENT	An amount equal to 10 and 00/100 Dollars ($10.00), to be paid up front on the Effective Date (the "**Option Payment**").

LIST OF EXHIBITS

EXHIBIT A – Depiction of the Land (entitled "Existing Conditions," "IMT WEST COLD STORAGE FACILITY," July 2015)
EXHIBIT B – Letter of Intent from Amber Infrastructure Group (January 27, 2020)
EXHIBIT C – Design-Build Agreement between Maine Port Authority and Woodard & Curran Constructors, LLC (Feb. 13, 2019, and as amended May 28, 2019)(without exhibits)
EXHIBIT D– Deed of Convenience, Book 36501, Page 146 (March 11, 2020)

1. **Grant of Option**. Owner hereby grants to Optionee the exclusive option (the "**Option**") to lease all or any portion of the Land and obtain any easements upon other portions of the Property reasonably required for access and utility connections (the "**Easements**" and together with the Land, the "**Premises**") that Optionee deems necessary for the Project (defined below), in accordance with this Agreement. If Optionee exercises the Option in accordance with Section 3 below, the parties shall enter into the ground lease agreement (the "**Lease**") as discussed in Section 4 below. "**Project**" shall mean the construction of the Maine International Cold Storage Facility as discussed in the Letter of Intent (attached as **Exhibit B**) (the "**LOI**").

2. **Option Period and Payment**.

(a) **Option Period**. The period during which the Option may be exercised shall commence on the Effective Date and continue until the expiration of the Option Period as described in the Basic Option Provisions above. Optionee shall have the right to extend the Option Period for one (1) additional three (3) month period, provided that Optionee delivers notice to Owner of its intent to extend the Option Period at least five (5) days prior to the original expiration of the Option Period. Notwithstanding the foregoing, the Option Period shall automatically terminate upon the earlier of (i) execution of the Lease by Owner and Optionee; (ii) Optionee providing written notice of its election to cancel this Agreement (in Optionee's sole and absolute discretion); or (iii) 5:00 p.m. (in the time zone where the Property is located) on the date of expiration of the Option Period (or extended Option Period, if Optionee so extends under this section).

(b) **Option Payment**. Within twenty (20) days after the Effective Date, Optionee shall pay to Owner the Option Payment.

3. **Notice of Exercise of Option**. Optionee may exercise the Option at any time during the Option Period by delivering to Owner a written notice exercising the Option (the "**Option Notice**").

4. **Lease Agreement.** If Optionee delivers an Option Notice to Owner, then Owner and Optionee shall, in good faith, negotiate and agree to a Lease over the Property. The terms and conditions of the Lease shall in all events include the relevant sections of the LOI, unless otherwise agreed by the parties.

5. **Closing**. Upon delivery of the Option Notice to Owner in accordance with Section 3 above, the execution of the Lease by Owner and Optionee (the "**Closing**") shall take place on a date mutually agreed by the Parties.

6. **Due Diligence; Title**.

(a) **Due Diligence**. Owner has already provided Optionee with a certain Design-Build Agreement between the Maine Port Authority and Woodard & Curran Constructors, LLC (attached as **Exhibit C,** without underlying exhibits). In furtherance of providing Exhibit C and related exhibits and papers, the Owner has already shared with Optionee all documents that Owner considers relevant to analyzing the Project contemplated in the LOI (Ex. B). Optionee may, at its discretion, utilize Exhibit C and its underlying documents during the Option Period or during the follow-on project, to whatever extent the Optionee deems appropriate. Owner provided Exhibit C and its related exhibits and papers to Optionee on an as-is, where-is basis without warranty, but Owner is not aware of any information contradicting Exhibit C and its underlying exhibits. If Owner becomes aware of additional documents or information that undermine or contradict any information contained in Exhibit C, Owner will notify Optionee of the same within ten (10) days.

(b) **Title**. Optionee, at its sole cost, may obtain a preliminary title report (the "**Title Report**") and/or survey (the "**Survey**") for the Property. If Optionee, in its sole discretion, determines that the existence, use, operation, implementation, or exercise of any matters identified by the Title Report or Survey could materially delay, interfere with, impair or prevent Optionee's development, operation or financing of the Project, then Optionee may notify Owner of such issues and Owner shall cooperate with Optionee in efforts to obtain a release, subordination, non-disturbance agreement, consent, or other agreement (in a form reasonably acceptable to Optionee) from the holder(s) of such rights. In the event that any holder(s) of such rights are unwilling to enter into a reasonable agreement to resolve the identified issue(s), the Optionee may, in its discretion, either accept the issue and execute the Option, thereby, subject to the terms of any definitive agreements (including the Lease), accepting the known issue, or terminate this Option, in which event the Owner will retain the Option Payment and this matter will be concluded.

7. **Right of Entry**

(a) **Investigations**. Beginning on the Effective Date and throughout the Option Period, Owner shall provide to Optionee, its employees, agents, contractors, and current or potential lenders or investors, reasonable access to the Property to conduct the Survey, evaluate, conduct and perform inspections, including soil and water testing, environmental assessments (Phase I and/or Phase II), engineering surveys, topographical, structural and geo-technical tests, and such other tests and inspections (collectively, the "**Investigations**") that Optionee may deem necessary or advisable in its sole discretion, upon Optionee providing at least twenty-four (24) hours' prior notice to Owner. Optionee shall keep the Property free from any liens arising out of any work performed, materials furnished, or obligations incurred by or on behalf of Optionee in connection with the Investigations. Optionee shall remove, or cause the removal of, any such lien by bond or otherwise within ten (10) days after Optionee becomes aware of the existence of such lien and if Optionee shall fail to do so, Owner may pay the amount necessary to remove such lien, without being responsible for investigating the validity thereof; provided, however, that the Optionee will be responsible to indemnify Owner in respect of the amounts paid to remove any such liens in accordance with § 7(b), *infra*.

(b) **Optionee Indemnification of Owner**. Optionee shall indemnify, defend and hold Owner harmless from and against all claims, losses, liabilities, damages, losses, costs or expenses (including, without limitation, reasonable attorneys' fees) (collectively, "**Claims**") which Owner may incur as a direct result of any act or wrongful omission by Optionee, its agents, or contractors in connection with the use of the Property; provided, however, that Optionee shall have no obligation or duty to indemnify, defend or hold Owner harmless from Claims (including, without limitation, Claims that the Property has declined in value) (i) arising out of, resulting from, or incurred in connection with the results or findings of Optionee's Investigations, (ii) to the extent such Claims are due to the acts or wrongful omissions of Owner or its employees, agents or contractors during the Option Period, (iii) to the extent such Claims are for any consequential or indirect loss or damage, or (iv) to the extent such Claims exceed amounts recovered by Optionee under the insurances required to be taken out pursuant § 10, *infra*. Notwithstanding the foregoing, Optionee's indemnification obligations shall not extend to any conditions on, at, or under the Property in existence as of the Effective Date, except and to the extent such conditions are aggravated by the gross negligence or willful misconduct of Optionee or its employees, agents or contractors. Optionee's obligations hereunder shall survive the termination or expiration of the Option Period for two years.

8. **Owner's Representations and Warranties**. Owner makes the following representations and warranties, which shall be true as of the Effective Date, the date the Option is exercised by Optionee, and shall survive the expiration or termination of this Agreement:

(a) **Authority**. Pursuant to a vote of the Owner's Board at a duly noticed public meeting on February 10, 2020, Owner has the full legal right, power and authority, without the consent of any additional party or parties, to enter into this Agreement and to perform its obligations hereunder. The execution and delivery of this Agreement and the consummation of all transactions and performance of all obligations contemplated hereby have been duly authorized and will not conflict with, or result in a breach of any of the terms or provisions of, or constitute a default under, any document or instrument to which Owner is a party.

(b) **Binding on Owner**. Pursuant to a vote of the Owner's Board at a duly noticed public meeting on February 10, 2020, the person executing this Agreement on behalf of Owner has full power and authority to bind Owner to the obligations set forth herein, and upon execution and delivery of the same, this Agreement will constitute a valid and binding instrument enforceable in accordance with its terms.

(c) **Exclusivity**. Owner represents and warrants it will not enter into any option, lease agreement, or similar transaction relating to the Premises with any other person or entity other than the Optionee during the Option Period (or Option Period as extended, if applicable).

(d) **Claims or Actions**. There are no current, pending or contemplated actions, administrative inquiries or proceedings, suits, arbitrations, claims or proceedings commenced by any person or governmental entity affecting Owner, the Property, or any portion thereof; provided, however, that this representation and warranty is further limited by § 8(g), *infra*..

(e) **No Violation of Laws.** To the best of Owner's knowledge, the Property is not in violation of any applicable federal, state, local or other laws, regulations or codes (the "**Laws**") and Owner has not received notice pertaining to the violation of any Laws affecting the Property or any portion thereof, and Owner has no knowledge of any facts which might be a basis for any such notice; provided, however, that this representation and warranty is further limited by § 8(g), *infra*.

(f) **Bankruptcy**. Owner has not (i) made a general assignment for the benefit of creditors; (ii) filed any voluntary petition in bankruptcy or suffered the filing of any voluntary petition by its creditors; (iii) suffered the appointment of a receiver to take possession of all or substantially all of its assets; or (iv) suffered the attachment or other judicial seizure of all or substantially all of its assets.

(g) **Fee Owner; Liens**. Owner holds the entire fee simple interest in the Property, except for the limitations on ownership detailed in the relevant Deed of Convenience from the Maine Department of Transportation to the Maine Port Authority, which is recorded at Book 36501 and Page 146 in the Cumberland County Registry of Deeds (a copy of which is attached hereto as **Exhibit D**) (the "**Deed**"), and any other encumbrances, covenants, and restrictions of record. Except as previously disclosed by Owner to Optionee in writing or as disclosed in the Title Report or Survey, Owner represents that there are no liens upon Owner's right, title or interest in the Property other than liens for monetary obligations for which Owner shall make best efforts to pursue a SNDA pursuant to § 9(a), *infra*. Except as otherwise listed in the Basic Option Provisions, Owner has not granted or entered into any other options, rights of first refusal, offers to purchase or lease or agreements to sell or lease all or any part of the Property ("**Third Party Interests**") other than with Optionee pursuant hereto.

(h) **Disclaimer of Certain Representations and Warranties**. Notwithstanding any of the foregoing representations and warranties, Owner makes no representations or warranties as to the legal or factual status of: land use and environmental matters; fitness of the Premises or any portion thereof for any particular purpose; water quality or quantity; the condition or quality of the soil; inchoate or unrecorded liens; or the existence, status, or condition of access to, or public utilities serving the Premises. Further reference is made to certain recorded covenants and restrictions, and all conditions and protections affecting the Premises as set forth in the records of the Maine Department of Environmental Protection's ("**DEP**") Voluntary Response Action Program ("**VRAP**") referencing the former Portland Gas Works site, some or all of which are listed in the relevant Deed (**Exhibit D**).

During the Option Period, Owner shall timely notify Optionee in writing of any changes affecting any of the foregoing representations and warranties.

9. **Owner's Covenants**. Owner hereby covenants and agrees that, from and after the Effective Date, though the Option Period and, if the Option is exercised, thereafter during the period up to and including the Closing:

(a) **Owner Mortgages**. Owner shall use commercially reasonable efforts to deliver to Optionee a subordination, non-disturbance and attornment agreement(s), in form and substance reasonably

acceptable to Optionee (each, a "**SNDA**") from the current holder(s) of any deed of trust, mortgage or other lien encumbering the Property. Owner shall make all payments required under any loan secured by a mortgage or deed of trust encumbering the Property and pay all real property taxes and assessments levied or imposed against the Property and before any of the same become delinquent. During the Option Period, Owner shall not mortgage or otherwise encumber its interest in the Property without providing Optionee with fifteen (15) days prior written notice thereof and an SNDA reasonably acceptable to Optionee from such holder(s) of any deed of trust, mortgage or other lien encumbering the Property. Notwithstanding anything in this § 9(a), Optionee is aware of the Maine Department of Transportation's residual interests in the Land as discussed in the Deed (Ex. D), and the Owner shall use commercially reasonable efforts to obtain such assurances or documents from the Department of Transportation as the Optionee may reasonably require.

(b) **Mortgage of Optionee's Interest**. Optionee shall have the right to obtain financing from one or more Financing Parties (such term to be defined in the Lease) by way of a direct or collateral assignment of this Agreement to a Financing Party, after providing seven days' written notice to the Owner. Owner agrees that, amongst other Financing Party protections and cure rights, Owner shall (a) acknowledge and consent to, amongst other things, Optionee assigning the Lease and the Easements and any other easements benefitting the Premises by way of direct or collateral assignment to a Financing Party, assignment of the Easements and a lease of the storage facility from such Financing Party to Optionee, grant the Financing Parties a sublease or other real property interest in Optionee's interest in and to the Premises, grant a first priority security interest in Optionee's interest in the improvements and/or the Lease and Optionee's other interests in and to the Premises, including, but not limited to, any Easements, rights of way or other similar interests; and (b) agree to execute such subordination agreements, consents, estoppels and other acknowledgements of the foregoing as Optionee or the Financing Parties may request. Notwithstanding the foregoing, Owner retains discretion to decline to acknowledge, consent, and/or agree to the items listed in this § 9(b), provided that such acknowledgement, consent, and/or agreement shall not be unreasonably withheld. Notwithstanding anything in this § 9(b), Optionee is aware of the Maine Department of Transportation's residual interests in the Land as discussed in the Deed (Ex. D), and the Owner shall use commercially reasonable efforts to obtain such additional assurances or documents from the Department of Transportation as the Optionee may reasonably require.

(c) **Permits; Cooperation with Development**. Optionee shall have the right to apply for applications for land use entitlements, environmental approvals and permits, site plans, and subdivision or minor land division requests and parcel maps. Owner shall cooperate with Optionee in Optionee's efforts to obtain such approvals by executing such documents as are reasonably necessary. Nothing in this § 9(c) relieves Optionee's obligations further discussed in § 7, *supra*; by way of example only and not limitation, these obligations include Optionee's obligation to pay for its investigations and indemnify Owner for same.

(d) **Use of the Property**. During the term of this Option, Owner will not commit waste on the Property or otherwise materially change the Property, nor will Owner agree to grant or permit any easement, lease, license, right of access or other possessory right in the Premises to any third party without the prior written consent of Optionee. Owner shall comply with all Laws applicable to the Property.

10. **Insurance.** Effective as of the date Optionee enters the Property for the Investigations, and continuing through the Option Period, Optionee shall obtain and maintain liability insurance for its activities on the Property. Such insurance will be in the amount of One Million Dollars ($1,000,000) per occurrence and a Ten Million Dollar ($10,000,000) policy limit, and will name Owner as an additional insured but only for liability arising out of Optionee's operations on the Property including, without limitation, coverage for damage or harm caused or incurred by Optionee and its employees and agents.

11. **Assignment**. Optionee shall have the right to assign its rights and obligations under this Agreement to any Optionee affiliate, third party, and/or party providing financing to Optionee only with the prior written consent of Owner. Owner shall not have any right to assign its rights and obligations under this Agreement without Optionee's prior written consent, not to be unreasonably withheld, conditioned or delayed.

12. **Termination**.

(a) **Default**. Each of the following events shall constitute an event of default by the applicable party and shall permit the non-defaulting party to terminate this Agreement and pursue the remedies at law described below, which, as to Owner, shall consist solely of the remedies at law described in Section 11(b) below, and, as to Optionee, shall consist solely of the remedies at law contained in Section 11(c) below.

(i) The failure of Optionee to pay the amount required to be paid hereunder when due.

(ii) The failure of either party to perform any of the other terms, agreements or conditions set forth in this Agreement, where such failure continues for thirty (30) days (or such longer period required to cure such failure, not to exceed sixty (60) days), after receipt of written notice from the other party; or

(iii) A party files for bankruptcy or has an involuntary petition in bankruptcy or a request for appointment of a receiver filed against it, where such involuntary petition or request is not dismissed within ninety (90) days after filing.

(b) **Owner Remedies – Liquidated Damages**. EXCEPT FOR OPTIONEE'S INDEMNIFICATION OBLIGATIONS CONTAINED IN THIS AGREEMENT, OWNER'S SOLE REMEDY AT LAW UPON AN EVENT OF DEFAULT BY OPTIONEE SHALL BE TO RETAIN THE OPTION PAYMENTS IT HAS THEN RECEIVED AS LIQUIDATED DAMAGES FOR SUCH DEFAULT OF OPTIONEE, AND IN SUCH EVENT, OPTIONEE SHALL HAVE NO FURTHER RIGHT WHATSOEVER TO LEASE THE PREMISES AND OWNER SHALL HAVE NO RIGHT TO SEEK ANY FURTHER DAMAGES OR REMEDY AT LAW. THE PARTIES AGREE THAT IT WOULD BE IMPRACTICAL AND/OR EXTREMELY DIFFICULT TO ASCERTAIN THE ACTUAL DAMAGES THAT WOULD BE SUFFERED BY OWNER AS A RESULT OF ANY SUCH DEFAULT BY OPTIONEE, AND THAT UNDER THE CIRCUMSTANCES EXISTING AS OF THE DATE OF THIS AGREEMENT, THE LIQUIDATED DAMAGES PROVIDED FOR IN THIS SECTION REPRESENT A REASONABLE ESTIMATE OF THE DAMAGES WHICH OWNER WILL INCUR AS A RESULT OF ANY SUCH DEFAULT BY OPTIONEE. SUCH RETENTION OF THE OPTION PAYMENTS BY OWNER IS INTENDED TO CONSTITUTE LIQUIDATED DAMAGES TO OWNER AND SHALL NOT BE DEEMED TO CONSTITUTE A FORFEITURE OR PENALTY.

(c) **Optionee Remedies – Liquidated Damages**. OPTIONEE'S SOLE REMEDY AT LAW UPON AN EVENT OF DEFAULT BY OWNER SHALL BE TO RECOVER AN AMOUNT EQUAL TO THE OPTION PAYMENT(S) IT HAS THEN PAID AS LIQUIDATED DAMAGES AS RECOMPENSE FOR SUCH DEFAULT OF OWNER. THE PARTIES AGREE THAT IT WOULD BE IMPRACTICAL AND/OR EXTREMELY DIFFICULT TO ASCERTAIN THE ACTUAL DAMAGES THAT WOULD BE SUFFERED BY OPTIONEE AS A RESULT OF ANY SUCH DEFAULT BY OWNER, AND THAT UNDER THE CIRCUMSTANCES EXISTING AS OF THE DATE OF THIS AGREEMENT, THE LIQUIDATED DAMAGES PROVIDED FOR IN THIS SECTION REPRESENT A REASONABLE ESTIMATE OF THE DAMAGES WHICH OWNER WILL INCUR AS A RESULT OF ANY SUCH DEFAULT BY OWNER. SUCH RECOVERY OF AN AMOUNT EQUAL TO THE OPTION

PAYMENTS TO OWNER IS INTENDED TO CONSTITUTE LIQUIDATED DAMAGES FOR OPTIONEE AND SHALL NOT BE DEEMED TO CONSTITUTE A FORFEITURE OR PENALTY.

(d) **Equitable and Statutory Remedies**. Notwithstanding any of the foregoing, both parties retain all rights to pursue equitable remedies (e.g. injunctive relief) and non-monetary statutory relief (e.g. forcible entry and detainer) as may be cognizable against the other. In no event will money damages, costs of suit, attorney's fees, interest, or any other amounts of money of any description be awarded to either party against the other to exceed the amount of liquidated damages described in § 12(b)-(c), *supra*. In the event the Parties are unable to negotiate to a mutually agreeable Lease, the maximum equitable remedy available will be an order to continue negotiating in good faith for a reasonable amount of time; in no event can either party be ordered to enter into a Lease as specific performance of this Option.

(e) **Termination by Optionee Absent Default by Owner**. If Optionee determines, in its sole and absolute discretion, that the Land is unsuitable or undesirable for leasing by Optionee, Optionee shall have the right to terminate this Agreement by giving written notice thereof to Owner and this Agreement shall terminate on the date specified in Optionee's written notice. If the Agreement is terminated during the Option Period pursuant to the preceding sentence, then neither party shall have any further rights or obligations hereunder; provided, however, that Owner shall retain all Option Payments it shall have received hereunder prior to the date of termination of the Option Agreement and any provisions hereof that expressly survive termination of this Agreement shall remain in effect.

13. **Miscellaneous**.

(a) **Investigatory Results**. For any Investigation undertaken by Optionee that involved entry onto the Premises by Optionee or any of its employees, contractors, or agents of any kind, Optionee will provide a copy of such investigatory reports, findings, or results of any kind to Owner within fourteen (14) days of such investigatory reports, findings, or results, at no charge to Owner. These materials may be provided electronically. By way of example only and not limitation, expressly included in this duty to turn over reports and findings are any soil sample findings and land survey results.

(b) **Waiver of Jury Trial and Selection of Venue**. EACH PARTY HERETO WAIVES, TO THE FULL EXTENT PERMITTED BY LAW, THE RIGHT TO A JURY TRIAL IN ANY LITIGATION CONCERNING THIS AGREEMENT OR ANY DEFENSE, CLAIM, COUNTERCLAIM, CLAIM OF SET-OFF OR SIMILAR CLAIM OF ANY NATURE. THE PARTIES AGREE THAT ANY DISPUTES OVER THIS AGREEMENT WILL BE LITIGATED EXCLUSIVELY IN THE MAINE STATE COURTS, AND WAIVE THE RIGHT TO PURSUE ANY DEFENSE, CLAIM, COUNTERCLAIM, CLAIM OF SET-OFF OR SIMILAR CLAIM OF ANY NATURE IN ANY OTHER FORUM. EACH PARTY CONSENTS IN ADVANCE TO PERSONAL JURISDICTION IN THE MAINE STATE COURTS.

(c) **Counterparts**. This Agreement may be executed in counterparts. All executed counterparts shall constitute one agreement, and each counterpart shall be deemed an original. The parties hereby agree signatures transmitted by facsimile or email shall be legal and binding and shall have the same full force and effect as if an original of this Agreement had been delivered and hereby waive any defenses to the enforcement of the terms of this Agreement based on the foregoing forms of signature.

(d) **Time Periods**. If any date for exercise of any right, giving of any notice, or performance of any provision of this Agreement falls on a Saturday, Sunday or holiday, the time for performance will be extended to the next business day.

(e) **No Waiver**. The failure of either party to require strict performance by the other party of any provision of this Agreement will not be considered a waiver of any other provision, nor prevent any party from enforcing that or any other performance at any time thereafter.

(f) **Further Assurances**. The parties shall at their own cost and expense execute and deliver such further documents and instruments and shall take such other actions as may be reasonably required or appropriate to carry out the intent and purposes of this Agreement.

(g) **Governing Law**. This Agreement is made pursuant to, and shall be construed and enforced in accordance with, the laws of the State of Maine.

(h) **Amendments; Entire Agreement**. This Agreement contains the entire agreement between the parties and is intended by the parties to set forth their entire agreement with respect to the subject matter hereof, and any agreement hereafter made shall be ineffective to change, modify or discharge this Agreement, in whole or in part, unless such agreement is in writing and signed by the party against whom enforcement of the change, modification or discharge is sought. Owner and Optionee agree that all prior or contemporaneous oral or written agreements between or amongst themselves or their agents are merged in or revoked by this Agreement.

(i) **Partial Invalidity**. If any term or provision of this Agreement is, to any extent, determined by a court of competent jurisdiction to be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each remaining term and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

(j) **Successors and Assigns**. This Agreement, and the rights and obligations of the parties hereto, shall be binding upon and inure to the benefit of the parties and their respective successors, heirs, executors, administrators and permitted assigns.

(k) **Interpretation**. Each party acknowledges that it has been represented by or had the opportunity to be represented by legal counsel in its review of this Agreement and that any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement or any amendments or exhibits hereto.

(l) **Survival of Terms**. All covenants, representations and warranties contained in this Agreement shall survive Closing. Those provisions in this Agreement which by their terms are intended to be or must be performed in whole or in part after the Closing or after termination of this Agreement shall survive Closing and the termination of this Agreement.

(m) **Headings**. The headings herein are inserted only for convenience and shall have no effect in interpreting the meaning of any provision.

(n) **Time is of the Essence**. Time is of the essence in this Agreement and each and every provision of this Agreement.

(o) **Notices**. All notices, approvals, disapprovals or elections required or permitted to be given under this Agreement shall be in writing and shall be (i) delivered personally; (ii) mailed by certified or registered mail, return receipt requested; (iii) sent by email transmission; (iv) sent by facsimile transmission; or (v) sent by Federal Express or other professional carrier, to the parties at the addresses listed below or at such other addresses as shall be designated by Optionee or Owner in writing. Except as expressly set forth in this Agreement, notices shall be deemed given upon delivery or tender of delivery to the intended recipient; provided, however, that (x) notice sent by email or facsimile shall only be deemed received when

both (A) the sender has electronic confirmation that it was sent to all parties (and has retained a confirmation of the delivery) and (B) at least one addressee entitled to notice for the applicable party has acknowledged receipt of the transmission; and (y) if a post office box is provided as the notice address, notice shall be deemed to have been given or made five (5) days after being deposited in the United States mail with appropriate postage prepaid. Copies of notices are for informational purposes only, and a failure to give or receive copies of any notice shall not be deemed a failure to give notice.

Owner Address

Maine Port Authority
Attn: Jon Nass, CEO
460 Commercial Street
Portland, ME 04101

Phone: 207-200-2400
E-mail: jon.nass@maineports.com

With a copy to:

Office of the Attorney General
Attn: Timothy Steigelman, AAG
6 State House Station
Augusta, ME 04333

Phone: 207-626-8509
E-mail: timothy.steigelman@maine.gov

Optionee Address

Attn: Thomas O'Shaughnessy
230 Park Avenue,
19th Floor
New York
10169
Phone: (347) 263-3213

With a copy to:

Attn: General Counsel
Amber Infrastructure Limited
3 More London Riverside
London, United Kingdom
SE1 2AQ

[SIGNATURE PAGE TO FOLLOW]

IN WITNESS WHEREOF, and intending to be bound hereby, the parties hereto have executed this Agreement on the date written above.

"Owner"

Maine Port Authority
a State of Maine "body both corporate and politic." 23 M.R.S. § 4420.

By: Jon Nass
Name: Jon Nass
Title: Chief Executive Officer

"Optionee"

Maine International Cold Storage Facility LLC,
a Delaware limited liability company

By: Tom O'Shaughnessy
Name: Tom O'Shaughnessy
Title: President

Exhibit A

Depiction of the Land
(entitled "Existing Conditions," "IMT WEST COLD STORAGE FACILITY," July 2015)

Exhibit B

Letter of Intent from Amber Infrastructure Group (January 27, 2020)

Exhibit C

Design-Build Agreement between Maine Port Authority Woodard & Curran Constructors, LLC
(Feb. 13, 2019, and as amended May 28, 2019)(without exhibits)

Exhibit D

Deed of Convenience
Book 36501, Page 146 (March 11, 2020)

Maine International Cold Storage Facility LLC (**"Optionee"**)
1330 Avenue of the Americas
Floor 28
New York, NY
10019

Maine Port Authority
Attn: Jon Nass, CEO
460 Commercial Street
Portland, ME
04101

Office of the Attorney General
Attn: Timothy Steigelman, AAG
6 State House Station
Augusta, ME
04333

June 5, 2020

Dear Jon,

OPTION TO GROUND LEASE DATED MARCH 12, 2020 BETWEEN THE MAINE PORT AUTHORITY AND OPTIONEE (THE "OPTION") – EXTENSION NOTICE

Pursuant to this letter, Optionee hereby exercises its right under Section 2(a) of the Option to extend the Option Period (as such term is defined in the Option) for one (1) additional three (3) month period (until September 12, 2020).

Your sincerely,

Tom O'Shaughnessy

Thomas O'Shaughnessy
For an on behalf of Optionee

5. EASEMENTS AND OTHER BURDENS

There are several easements currently located on the property. They are as follows:

- 20-foot wide easement to CMP
- 30-foot wide easement to CMP (10892/32 & 10600/111)
- 30-foot wide sewer easement to the City of Portland (31021/187 & 31378/333)
- 25-foot wide easement to N.E.T&T (2361/361)

These easements are on the eastern portion of the property and none of them will be impacted by the proposed project.

There are no new proposed easements with the development of the Cold Storage Facility. The Boundary Survey attached to Section 12 shows and describes easements located within the parcel. Proposed work will not change or restrict access to facilities, utilities, amenities, or resource, public or private.

Standard to be Waived: Cite Ordinance or Technical Manual Standard	**Cite Standard Language:** Cite specific language of applicable Ordinance or Technical Manual Standard	**Waiver Being Sought:** Describe waiver being sought. Ex. – We are requesting a two-way parking lot drive aisle width of 20' feet.	**Justification for Waiver:** Address specific waiver criteria, if applicable, and document reasons for the waiver request.
City of Portland Land Use Code Section 14-526(a)2.c.(i)	All proposed developments shall provide sidewalks along all frontages in accordance with Sections 14-498 and 14-499 of the City Code. An applicant may request a waiver from curb and sidewalk installation requirements if they meet applicable waiver criteria.	We are requesting a waiver from the sidewalk requirement. The site meets the waiver criteria listed in Section 506(b) (Items 2. and 3.).	The frontage of the proposed project is comprised of an existing driveway opening. No sidewalk exists on either side of the driveway opening on the southern side of West Commercial Street. An existing internal sidewalk in a landscaped island at the site
City of Portland Technical Manual Section 1.7.2.4	Maximum widths shall not exceed the following, although confirmation of exact capacity requirements will be necessary: • Commercial - 24 feet • Industrial – 30 feet	We are requesting a waiver from the maximum driveway width requirement.	The proposed facility and previously approved adjacent IMT facility require turns into and out of the site by large vehicles. Please refer to attached turning movement figures and previously approved IMT turning movement figures for
City of Portland Technical Manual Section 1.14. Parking Lot and Parking Space Design Section 1.14	Parking spaces shall meet the following dimensional requirements: • Standard parking space: 9 feet wide by 18 feet long. Parking lot layout shall conform to Figures I-28 thru I-32	55'x12' truck parking spaces and 116' drive aisle.	These dimensions are required to accommodate tractor trailer movements and parking. The Land Use Ordinance does not address large vehicle parking areas, only passenger car parking areas.

6. EVIDENCE OF STATE AND/OR FEDERAL APPROVALS

In addition to the City's Level III Site Plan Review, the proposed project requires the following permits:

- MaineDEP Site Location of Development (reviewed by City of Portland under Delegated Review Authority);
- MaineDEP Natural Resources Protection Act Permit-by-Rule;
- ACOE Category II Permit;
- City of Portland Flood Hazard Development Permit;
- Maine Construction General Permit Notice of Intent; and
- FAA Notice of Proposed Construction.

Permit approvals will be submitted to the City upon receipt.

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

March 17, 2020

Darrin Stairs
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

RE: Information Request – 40 West Commercial Street Cold Storage Facility Project, Portland

Dear Darrin:

Per your request received on March 04, 2020, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *40 West Commercial Street Cold Storage Facility* in Portland.

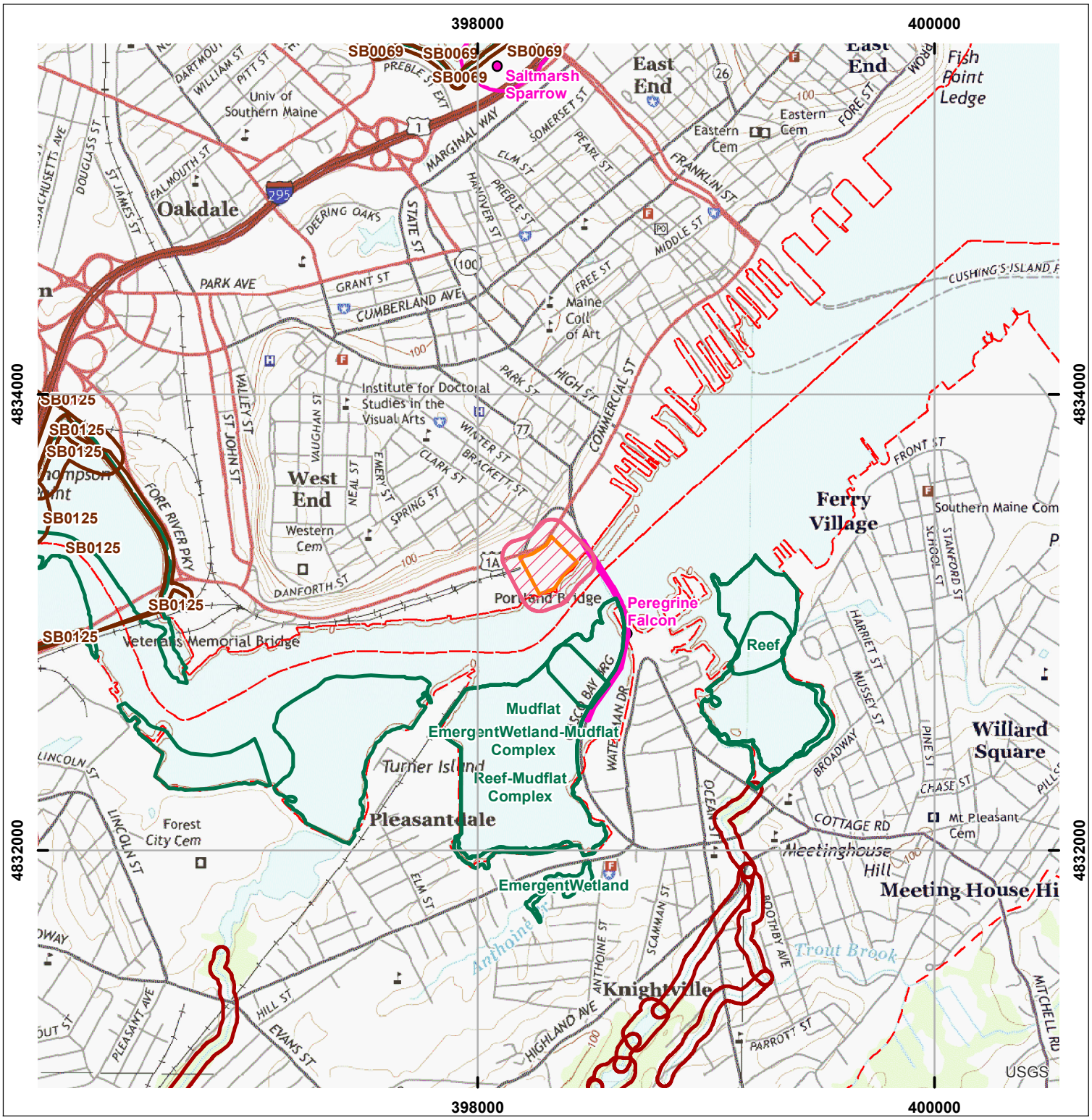
Our information indicates no locations of Endangered, Threatened, or Special Concern species within the project area that would be affected by your project. Additionally, our Department has not mapped any Essential or Significant Wildlife Habitats or inland fisheries habitats that would be directly affected by your project.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program, Maine Department of Marine Resources, and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

Becca Settele
Wildlife Biologist



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: 40 West Commercial Street cold storage facility, Portland (version 1)

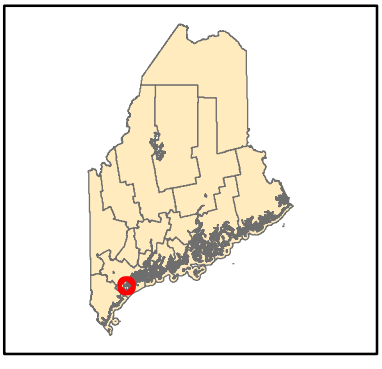
Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 3/5/2020

- ProjectPoints
- ProjectLines
- ProjectPolys
- ProjectSearchAreas
- Maine Cliff and Talus Areas
- Deer Winter Area
- LUPC p-fw
- Cooperative DWAs
- Seabird Nesting Islands
- Shorebird Areas
- Inland Waterfowl and Wading Bird
- 2008 Iwwh - Shoreland Zoning
- Tidal Waterfowl and Wading Bird
- Significant Vernal Pools
- Environmental Review Polygons
- Roseate Tern
- Piping Plover and Least Tern
- Aquatic ETSc - 2.5 mi review
- Rare Mussels - 5 mi review
- Maine Heritage Fish Waters
- Arctic Charr Habitat
- Redfin Pickerel and Swamp Darter Habitats - buffer100ft
- Special Concern occupied habitats - 100ft buffer
- Wild Lake Trout Habitats



9. ASSESSMENT OF ZONING

The project is located within the City of Portland Waterfront Port Development Zone (WPDZ) and partially within the Shoreland Overlay Zone and is subject to the requirements of the City of Portland Code Ordinances, Chapter 14 Land use, Division 18.5, Division 26 and Division 26.5. The purpose of the WPDZ ordinance, as defined by the Ordinance, is to ensure the continued viability of the Port of Portland.

9.1 PERMITTED USES (14-319)

Cold storage facility, warehousing, and storage of goods which are awaiting shipment via cargo carriers are permitted uses within the WPD Zone.

9.2 DIMENSIONAL REQUIREMENTS (14-320.2)

The attached Zoning Assessment Table shows the project complies with conditional use dimensional standards specified in the City's Land Use Ordinance.

9.3 PERFORMANCE STANDARDS (14-320.3)

a) *Outdoor Storage of Materials*

There will be no outdoor storage of materials as part of the proposed construction, all storage will be within the Cold Storage building.

b) *Noise*

An acoustic study was performed by Tech Environmental for the proposed refrigeration facility and summarized in a report dated February 25, 2020 attached to Section 8. The results indicate noise associated with facility operations will not exceed regulated levels and will not negatively impact surrounding development in its urban setting. Table 3 of the letter report presents the results from the model and demonstrate that the project will comply with City of Portland Code of Ordinance Chapter 14 Sec. 14-320.3.

c) *Vibration*

There will be no change to the vibration generated on site as part of the proposed Cold Storage building construction. Vibration associated with the proposed development will not exceed regulated levels.

d) *Federal and State Environmental Regulations*

The proposed development will comply with applicable federal and state environmental statutes and regulations regarding emissions into the air.

e) *Discharge into Harbor Areas*

The proposed development will not discharge wastewater into harbor areas, the proposed Cold Storage building will tie into existing sanitary sewer infrastructure onsite, which ultimately connects into the City of Portland Collection System.

f) *Storage of Vehicles*

There will be no storage of vehicles onsite due to the proposed development.

g) *Landfill of Docking and Berthing Areas*

There will be no landfill of docking and berthing areas due to the proposed development.

h) *Off-Street Parking*

Adequate off-street parking has been provided as described in Section 8 of this Report.

i) Off-street Loading

Off-street loading has been provided in accordance with Division 21 of the City of Portland Land Use Ordinance as described in Section 8 of this Report.

j) Shoreland and Flood Plain Management Regulations

Portions of the proposed building, emergency access driveway, loading area and parking areas are located within two hundred fifty (250) feet horizontal distance of the normal high water line of Fore River as shown on the design drawings. Portions of the proposed development are also located within special flood hazard area A2 identified on the FEMA FIRM map attached to Section 2 of this Report. Compliance with Division 26, Shoreland Regulations, and Division 26.5, Flood Plain Management Regulations, is addressed in Sections 9.4 and 9.5 respectively.

k) Lighting

Site lighting has been provided in accordance with City standards. A Photometric Plan and cut sheets for proposed lighting fixtures are provided in Section 8 of this Report.

l) Signs

All signs proposed will be in conformance with Division 22 of the City of Portland Land Use Ordinance.

m) Storage of Pollutants and Oily Wastes

There will be no change in the storage of pollutants and oily wastes at the IMT. All storage will be in conformance with the City of Portland Land Use Ordinance.

n) Compatibility of Nonmarine Uses with Marine Uses

The proposed Cold Storage Building will not interfere with marine activities.

o) Design and Visual Character

All mechanical equipment will be visually screened to minimize negative visual impacts onsite, refer to attached drawing set for location of proposed mechanical equipment and screening. Design and visual character is discussed in greater detail in Section 2.4.2.

9.4 SHORELAND REGULATIONS (14-449)

a) Principal and accessory structures

The proposed building is not located within 75-feet of the normal high water line of the Fore River as shown on the design drawings. A portion of the proposed development is located within Flood Zone AE and FEMA Special Flood Hazard Zone A2, including a section of the proposed building. A City of Portland Flood Hazard Development Permit will be submitted to the City for review. The lowest floor elevation of the proposed building (14 feet) is located more than one foot above the 100-year flood elevation (10 feet).

b) Piers, docks, wharves, bridges and other structures and uses extending over or below the normal high water line of a water body or within a wetland

A new outlet will be installed to discharge stormwater into the Fore River; a separate Maine DEP NRPA Permit-by-Rule and Army Corps of Engineers Category II permit will be obtained for work below normal high water.

c) Clearing or removal of vegetation

The project is located within the Waterfront Port Development Zone; therefore, this section does not apply.

d) *Erosion and sedimentation control*

Adequate erosion controls will be provided for the proposed development as described in the Stormwater Management Plan attached to Section 8 of this Report.

e) *Soils*

Soil will be handled, managed and disposed per the required Soil Management Plan for the Site, as described in Section 13.1 of this Report.

f) *Water quality*

Adequate provisions have been made to treat stormwater runoff from the proposed development as described in the Stormwater Management Plan attached to Section 8 of this Report. No other discharges are proposed.

g) *Archaeological sites*

The project is not located within a Historic District and does not directly impact any historic landmarks.

h) *Installation of public utility service*

No public utilities are proposed. Private utility service connections are described in Section 13 of this Report.

i) *Essential services*

No essential services are proposed in the Shoreland Zone; this section does not apply.

j) *Roads and driveways*

There is no setback requirement for roads and driveways in the Waterfront Port Development Zone. Runoff from the proposed emergency access driveway will largely be captured and conveyed through the stormwater management system. Runoff for areas not captured by the drainage system will sheet flow across the roadway into the adjacent vegetated area; concentrated flows are not anticipated.

k) *Parking areas*

There is no setback requirement for parking areas in the Waterfront Port Development Zone; this section does not apply.

l) *Septic waste disposal*

No septic waste disposal is proposed; this section does not apply

m) *Stormwater runoff*

As demonstrated by the Stormwater Management Report attached to Section 8 of this Report, the proposed project has been designed to comply with the City of Portland Technical Manual. An Operations and Maintenance Plan has been developed for the project and is included in the Stormwater Management Report.

n) *Agriculture*

No agricultural operations are proposed; this section does not apply.

o) *General site plan features*

As demonstrated in the sections above, the proposed development is in conformance with the Shoreland Regulations.

9.5 FLOOD PLAIN MANAGEMENT REGULATIONS (14-450)

Portions of the proposed development are located within special flood hazard area A2 identified on the FEMA FIRM map attached to Section 2 of this Report. A Flood Hazard Area Development Permit will be submitted to the City under separate cover.

9.6 ATTACHMENTS

- Zoning Table

ZONING ANALYSIS Relevant Zone(s) WPDZ & Shoreland Overlay

All Projects:

	Required	Proposed
Lot Size	None	17.9 acres
Area Per Dwelling Unit	NA	N/A
Minimum Street Frontage	None	N/A
Front Yard Minimum	N/A	N/A
Front Yard Maximum	N/A	N/A
Rear Yard	N/A	N/A
Yard Right	N/A	N/A
Yard Left	N/A	N/A
Side Street Setback	N/A	N/A
Step Back	N/A	N/A
Maximum Lot Coverage	50%	14%
Minimum Lot Coverage	N/A	N/A
Maximum Height	75	<75
Open Space	N/A	N/A
Maximum Impervious Area	N/A	N/A
Pavement Setback	N/A	N/A
Floor Area Ratio	N/A	N/A
Off Street Parking Spaces	TBD**	
Loading Bays	N/A	12
Other 1 Maximum Building Length	450	444
Other 2		
Other 3		

**Note: Per Section 14-332.2(c) of the City's Ordinance, the Planning Board shall establish the parking requirements based upon parking analysis submitted by the Applicant.

N/A

Planned Residential Unit Developments (PRUD) Requirements

	Required	Proposed
Minimum Lot Size		
Minimum Lot Area per Dwelling		
Maximum # Units per Building		
Maximum Building Length		
Maximum Accessory Building Length		
Minimum Setbacks		
Minimum Building Separation		
Minimum Open Space		

N/A

Affordable Housing Density Bonuses (if applicable)

	Bonus Increase or Decrease	Maximum Allowable With Bonus	Proposed
Density			
Height			
Setback Reduction			
Recreation Space			
Maximum Accessory Building Length			
Minimum Setbacks			
Minimum Building Separation			
Minimum Open Space			
Explanatory Text 1 (optional):			
Explanatory Text 2 (optional):			
Explanatory Text 3 (optional):			

ZONING ANALYSIS Relevant Zone(s) WPDZ & Shoreland Overlay

All Projects:

	Required	Proposed
Lot Size	None	17.9 acres
Area Per Dwelling Unit	NA	N/A
Minimum Street Frontage	None	N/A
Front Yard Minimum	N/A	N/A
Front Yard Maximum	N/A	N/A
Rear Yard	N/A	N/A
Yard Right	N/A	N/A
Yard Left	N/A	N/A
Side Street Setback	N/A	N/A
Step Back	N/A	N/A
Maximum Lot Coverage	50%	14%
Minimum Lot Coverage	N/A	N/A
Maximum Height	75	<75
Open Space	N/A	N/A
Maximum Impervious Area	N/A	N/A
Pavement Setback	N/A	N/A
Floor Area Ratio	N/A	N/A
Off Street Parking Spaces	TBD**	
Loading Bays	N/A	12
Other 1 Maximum Bldg. Length, over 60' height	450	444
Other 2		
Other 3		

**Note: Per Section 14-332.2(c) of the City's Ordinance, the Planning Board shall establish the parking requirements based upon parking analysis submitted by the Applicant.

N/A

Planned Residential Unit Developments (PRUD) Requirements

	Required	Proposed
Minimum Lot Size		
Minimum Lot Area per Dwelling		
Maximum # Units per Building		
Maximum Building Length		
Maximum Accessory Building Length		
Minimum Setbacks		
Minimum Building Separation		
Minimum Open Space		

N/A

Affordable Housing Density Bonuses (if applicable)

	Bonus Increase or Decrease	Maximum Allowable With Bonus	Proposed
Density			
Height			
Setback Reduction			
Recreation Space			
Maximum Accessory Building Length			
Minimum Setbacks			
Minimum Building Separation			
Minimum Open Space			
Explanatory Text 1 (optional):			
Explanatory Text 2 (optional):			
Explanatory Text 3 (optional):			

7. EVIDENCE OF FINANCIAL & TECHNICAL CAPACITY

7.1 FINANCIAL CAPACITY

Attached to this Section is a letter from President of Amber Infrastructure LLC, which includes annual audited account information, demonstrating that Maine International Cold Storage Facility LLC has financial capacity to support the proposed project.

7.2 TECHNICAL CAPACITY

On behalf of the Applicant, Woodard & Curran is preparing this application for the proposed development. Woodard & Curran has extensive experience with design for site development projects and specifically on the peninsula within the City of Portland. Woodard & Curran, a 1,000-person Portland-based firm, has provided engineering services to the public and private sector for over 40 years, including permitting, civil/site engineering, stormwater and construction management services.

Woodard & Curran has been involved in numerous development projects in the Greater Portland Area and has developed working relationships with various consultants who are called upon, as necessary, to provide specialized services. The project is also supported by a design team including CWS Architects, Pat Carroll Landscape Architects, Thornton Tomasetti Structural Engineers and Bartlett Electrical Engineering. Copies of resumes or project examples can be provided upon request.

7.3 ATTACHMENTS

- Financial Capacity Letter

AMBER
INFRASTRUCTURE GROUP

Ms Christine Grimando
AICP Planning Director
Planning & Urban Development
Department 389 Congress Street 4thFloor
Portland
ME 04101

February 28, 2020

Re: the Maine International Cold Storage Facility ("MICSF")

Dear Ms. Grimando,

It is my pleasure to provide this letter confirming Amber Infrastructure Group's ("Amber") relationship with Maine International Cold Storage Facility LLC.

MICSF LLC is a wholly owned subsidiary of Amber and has been created as a Special Purpose Entity to undertake the development, financing, construction, ownership and operation of the proposed MICSF to be constructed in partnership with the Port Authority at the Portland Marine Terminal.

Amber is an international infrastructure developer and fund manager with over $8bn under management. Amber invests in eight countries internationally across six funds. Amber's core business focuses on sourcing, developing and investing in infrastructure sectors that support the lives of people, homes and businesses internationally.
Amber is headquartered in London with offices in Europe, North America and Australia and employs approximately 125 infrastructure professionals.

I have attached Amber's latest set of annual audited accounts for your review. These demonstrate our available cash resources which exceed £107m ($139m) which exceed the anticipated financing requirement of the development and financing of the MICSF.

Should you require any further information please do not hesitate to contact me.

Yours sincerely



Tom O'Shaughnessy, President, Amber Infrastructure LLC

Proposed Architectural Refinements

Throughout the Planning Board and City Planning Staff review process, the design team has been provided with comments, recommendations and suggestions assisting with the interpretation of the design intent for working waterfront design guidelines. We appreciate this support and are pleased to provide the attached package reflecting changes made to the Architectural elements of the building's exterior in direct response to this feedback. The following bullet points highlight the changes that can be found upon reviewing the drawing package.

- The color contrast between the lower portion of the cooler and the upper portion of the cooler has been strengthened to help break up the wall plane.
- The brick wainscot height has been increased to better reflect its intent in recognizing one of the City's most prevalent building materials.
- Slide 7 of 12 has been added to the presentation package depicting two options for the waterfront/south side of the building. These are intended to be utilized as discussion points during the meeting.

  Top image – Planting Configuration A: These elevations as well as the renderings that follow reflect full growth trees as opposed to day one plantings. This option proposes book-ending the building with full sized trees while providing lower ground cover along the top of the 4'-0" berm through the body of the elevation. A mural reflecting a plan view of the Portland waterfront is proposed and is intended to recognize the building's nautical link to the waterfront and its day to day working fabric. This mural is a representation of a navigation chart showing the piers and working waterfront of Portland, speaks to the connection of this facility to the Port and maritime trade, and includes bathymetric contours and a compass rose to reinforce this maritime connection. The low ground cover has been proposed so as not to obstruct the view of the mural but still provide a buffer between the building and the Fore River.

  Lower Image – Planting Configuration B: This option is a direct response to the request that additional plantings be provided along this side of the building. This option also depicts full grown trees. Due to the trees obscuring views to the wall beyond, the mural would not be applied in this option.

- Slides 8 through 12 represent updated renderings that incorporate the changes noted above. Note that slide 12 depicts Planting Configuration A, which is the preferred option from the standpoint of the applicant.

8. CONSISTENCY WITH PORTLAND DESIGN STANDARDS & DESIGN MANUAL

Section 14-526 of the City of Portland's Land Use Code outlines the site plan standards that must be met by Level III Site Plan projects. The proposed development will follow the City's design standards as described in the following section.

8.1 TRANSPORTATION

1. *Impact on Surrounding Street Systems*
   The attached preliminary Trip Generation Analysis was prepared by Sewall for the proposed development. Based upon the results of the analysis, a TMP should not be required since peak hour trip generation will not exceed the 100-trip threshold.

2. *Access and Circulation*
   The Cold Storage Facility has been designed to separate passenger car traffic from truck traffic. Trucks entering from West Commercial Street will turn east to the loading dock side of the building, which is closer to the rest of the IMT facility. Employee passenger cars will enter from West Commercial Street and turn to the west, to a passenger car parking area located on the west side of the building. Pedestrian walkways will connect the passenger car parking area with the administration portions of the building. A striped crosswalk will provide pedestrian access to West Commercial Street. Pedestrians can then cross at the signalized intersection of West Commercial and Beach Streets to a sidewalk on the north side of West Commercial Street. A turning movement figure is attached to this Section.

3. *Loading & Servicing*

   The proposed development will safely accommodate delivery and service vehicles. A clear route and travel way is provided on the northern and eastern sides of the building from West Commercial Street to the truck loading area. Twelve spaces are provided for trucks at the loading dock and an additional twelve spaces are provided across the 91-foot wide driveway aisle. Truck berths will be 15 feet wide and 55 feet long. The site design permits safe turning and backing.

4. *Sidewalks*
   The project frontage is comprised entirely of the entrance driveway. There are no existing sidewalks on either side of the driveway entrance on West Commercial Street; therefore, no crosswalk is proposed across the driveway entrance. A crosswalk will be provided from the proposed building to the existing crossing at West Commercial Street, as described in Section 8.1.2 above.

5. *Public Transit Access*
   No changes to public transit access are proposed as part of this project.

6. *Parking*
   In accordance with Section 14-322.2(c), where construction is proposed of new structures having a total floor area in excess of fifty thousand (50,000) square feet, the planning board shall establish the parking requirement for such structures. The proposed cold storage facility is estimated to have 25 employees. The Institute of Transportation Engineers (ITE) provides peak period parking demand on an employee basis by land use (*Parking Generation*, 4th Edition). Based on ITE parking data, the average peak demand for warehousing is 0.78 spaces per employee and the 85th percentile rate is 1.01 space per employee. Therefore, 25 parking spaces should be provided for the 25 projected employees. An employee parking lot with 29 standard parking spaces and 2 accessible parking spaces (31 total spaces) will be provided on the west side of the facility. Six bicycle parking spaces will be provided for the site.

7. *Snow Storage*
   Snow storage locations are located within lawn areas adjacent to the proposed parking area as shown on the design drawings attached to Section 2 of this Report.

8. *Transportation Demand Management (TDM)*
   The proposed building exceeds 50,000 SF of total floor area; therefore, TDM requirements apply to this development per Section 14-526(a)5.a.(ii). However, as previously mentioned, only 25 employees are anticipated to work at the facility. A waiver from this standard is requested.

8.2 ENVIRONMENTAL & LANDSCAPE FEATURES

1. *Preservation of Significant Natural Features*
   The IMT property was previously developed and there are no known areas of significant natural features including unusual natural areas, threatened or endangered botanical features, areas of significant wildlife habitats, aquifers, waterbodies, or wetland areas within the work area for the project. The attached Official Species List identifies the northern long-eared bat, which has been listed as a Federally Threatened Species, in association with the project area (a common designation across the state); however, there are no critical habitat areas located within the project area. Based on US Fish & Wildlife information, the northern long-eared bat typically lives in caves during the winter months, and in trees larger than three inches in diameter during the summer, with migration between these two habitats in the spring in the fall. The project is located in an existing urban, developed area and no trees meeting the criteria for bat habitat are proposed to be impacted by the project. Other publicly available data indicates that the project is not located in any significant plant or animal habitat, on any identified conservation land, or in wetlands as shown in the figures attached to this Section.

2. *Landscaping & Landscape Preservation*
   The existing site was previously developed and a few small trees exist on the site. Site disturbance will be limited to the greatest extent to construct the project. Landscaping Plans are included in the Design Drawings attached to Section 2 of this application.

3. *Site Landscaping & Street Trees*
   The frontage of the project site is comprised entirely of the access driveway, which prevents the planting of required street trees in the City right-of-way. The applicant intends to contribute to the City's Tree Fund. Landscaping Plans are included in the drawings referenced in Section 2 of this Report.

8.3 ENVIRONMENTAL & STORMWATER

1. *Water Quality, Stormwater Management & Erosion Control*
   The project must comply with the water quality, stormwater management, and erosion control standards identified by the City of Portland in the Land Use Chapter of the Code of Ordinances, as well as the MaineDEP Chapter 500 Stormwater Standards associated with Site Location of Development Act Permit requirements. The existing site manages Stormwater through a series of catch basins that discharge to the Fore River. The proposed site upgrades will connect to the existing collection system. The Stormwater Management Plan included with this application demonstrates that the proposed development meets the applicable standards.

   The project has been designed to minimize the impact of stormwater leaving the site. The project will not result in the flooding of adjacent lots or City property. Additionally, the project is not located within the

watershed of an Urban Impaired Stream and is not anticipated to pose a risk of groundwater contamination during or after construction. Erosion and sediment control measures are described in the attached Stormwater Management Plan and detailed on the drawings. The development has also been designed to provide for the adequate and sanitary disposal of sewage, as further described in Section 13 of this Report.

8.4 PUBLIC INFRASTRUCTURE & SAFETY

1. *Consistency with City Master Plan*
   The development's consistency with City Master Plan is described in Section 10 of this Report.

2. *Public Safety and Fire Prevention*
   Provisions for public safety have been incorporated into the design of site visibility, access, and territorial reinforcement. Adequate emergency vehicle access is provided via the proposed access driveway. Compliance with the Portland Fire Department Site Review Checklist is described in Section 14 of this Report. The full plan set will be provided to the Fire Department Reviewer, along with a cover letter including the items in the Portland Fire Department Site Review Checklist, as described in Section 14 of this Report.

3. *Availability and Adequate Capacity of Public Utilities*
   The availability and adequate capacity of public utilities is described in Section 13 of this Report.

8.5 SITE DESIGN

1. *Massing, ventilation, and wind impact*
   The proposed building will not result in any reduction in ventilation to abutting structures or unsafe wind conditions on the site.

2. *Shadows*
   No adverse impacts from shadows are anticipated to result from the proposed project.

3. *Snow and ice loading*
   The proposed building has been designed to accommodate appropriate snow and ice loads and to prevent significant amounts of accumulated snow and ice from falling onto adjacent properties or public ways.

4. *View corridors*
   The proposed development will not obstruct public view corridors identified in the City's Downtown Vision View Corridor Protection Plan.

5. *Historic Resources*
   The project is not located within a Historic District and does not directly impact any historic landmarks.

6. *Exterior Lighting*
   A Site Lighting Report by Bartlett Design dated March 2, 2020, and accompanying cut sheets for proposed lighting fixtures, Photometric Plans, and Site Lighting Plan are attached to this Section.

7. *Noise and Vibration*

Construction activities will be limited to hours permitted by the City. HVAC and primary mechanical equipment will be located and screened to mitigate noise impacts. Final HVAC equipment is in the process of being selected. HVAC and primary mechanical equipment will be located on the project in such a way as to direct exhaust away from adjacent properties and will meet federal emissions standards.

An acoustic study was performed for the proposed refrigeration facility. The study is summarized in the Noise Modeling Analysis Report by Tech Environmental dated February 25, 2020 attached to this Section. The acoustic modeling included thirty-two residential receptors and three property line receptors. Two modeling scenarios were performed: daytime, which consisted of twenty refrigerated trucks and one condenser, and nighttime, which consisted of ten refrigerated trucks and one condenser. The results of the acoustic study were compared to the City of Portland Code of Ordinance. The pre-existing sound levels are in the 50-60 dBA range for daytime and nighttime sound levels. The results indicate noise associated with facility operations will not exceed regulated levels and will not negatively impact surrounding development in its urban setting. Table 3 of the letter report presents the results from the model and demonstrate that the project will comply with City regulations.

8. *Signage and Wayfinding*
   No building signage is proposed at this time. Sign permit applications will be submitted under separate cover. The size, scale, proportions, design, materials, placement, quantity and source and intensity of illumination shall be designed to complement and enhance the architectural attributes of the proposed building.

9. *Zoning Related Design Standards*
   An assessment of the City Zoning requirements is provided in Section 9 of this Report.

8.6 ATTACHMENTS

- Traffic Assessment prepared by Sewall (uploaded separately in Eplan)
- Turning Movement Figure
- Stormwater Management Plan (uploaded separately in Eplan)
- Official Species List
- Plant and Animal Habitat Map
- Conservation Land Map
- National Wetlands Inventory Map
- Noise Modeling Analysis prepared by Tech Environmental
- Site Lighting Report, Cut Sheets, Photometric Plans and Site Lighting Plan prepared by Bartlett Design

WEST COMMERCIAL STREET
U.S. ROUTE 1A
PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST.

18"BRICK

RIM=15.85

RIM=17.20
CL INV.=3.2

N73°01'23"E
1053.20'

N16°58'37"W
149.35'

S70°47'58"W
381.52'

N:295843.13
E:2927103.20

RIM=15.00
CL INV.=8.5

GAS STUB

STABILIZED CONSTRUCTION ENTRANCE (TYP)

RIM=12.86
INV. IN=7.55
INV. OUT=7.48

RIM=13.10
INV. IN=4.4 18"
INV. IN=4.4 8"
INV. IN=5.8 12"
INV. OUT=4.3 18"

RIM=12.65
INV. IN(A)=9.93
INV. IN(B)=9.95
INV. OUT=10.91

RIM=12.81
INV. OUT=10.06'

RIM=12.77
INV. IN=11.17
INV. OUT=11.02

RIM=12.96
CL INV.=6.3

RIM=13.12
INV.=6.62 12"PVC W/HOOD

RIM=13.21
INV. IN=6.31 12"
INV. IN=5.91 15"
INV. OUT=5.86

RIM=12.73
INV.=10.13 HOOD

RIM=13.06
INV. OUT=7.96

RIM=10.4
CL INV.=2.0
INV. IN=6.9 8"

SMH RIM=
CL INV.=3.1

RIM=14.66
CL INV.=2.0

30' WIDE SEWER EASEMENT TO CITY OF PORTLAND
31021/187
31378/333

20' WIDE CMP EASEMENT

250' FROM H.A.T.
SHORELAND ZONE

CB1 CB2 CB3 CB4 CB5 CB6 CB7 CB8 CB10 CB11
DMH1 DMH2 DMH3 DMH4
PIPE 1 PIPE 2 PIPE 3 PIPE 4 PIPE 5 PIPE 6 PIPE 7 PIPE 8 PIPE 9 PIPE 10 PIPE 11 PIPE 12 PIPE 13 PIPE 14 PIPE 15 PIPE 16 PIPE 17

CATCH BASIN INLET PROTECTION (TYP)

SUBSURFACE R-TANK

JELLYFISH

SEDIMENT BARRIER (TYP)

HIGHEST ANNUAL TIDE LINE ELEVATION 7.2 NGVD 1929

SETBACK

100 YEAR FLOOD LINE

RIP RAP

N:295526.82
E:2927...

N21°46'00"W 105.4'

LAND NOW OR FORMERLY
OWNED BY
NEW YARD, LLC
30887/247

FORMER HARBOR COMMISSIONERS LINE OF 1923

600'±
S57°45'10"W

400'±
S62°18'00"W

117±'

FLOATING TURBIDITY CURTAIN, SEE DETAIL

STORMWATER OUTFALL WITH CHECKMATE INLINE CHECK VALVE, SEE DETAIL
INV OUT=0.83

FORE RIVER

30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

PERMIT SET - NOT FOR CONSTRUCTION

41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

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REV	DESCRIPTION	DATE
1	03/27/20 1:00pm	

CHECKED BY: DS

REV	DESCRIPTION	DATE

DESIGNED BY: ANL DRAWN BY: BDM/JSF

AASHTO WB-67 VEHICLE
TRACKING TURN MOVEMENT

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: MARCH 2020
SCALE: AS NOTED
SHEET: 1 OF 1

FIGURE 1

I:\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\Wpf\Drawings\Civil\0232277.09 C105 Fig Mar 13, 2020 - 2:24pm

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: February 24, 2020
Consultation Code: 05E1ME00-2020-SLI-0741
Event Code: 05E1ME00-2020-E-02460
Project Name: MPA Cold Storage Facility

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2020-SLI-0741

Event Code: 05E1ME00-2020-E-02460

Project Name: MPA Cold Storage Facility

Project Type: DEVELOPMENT

Project Description: Proposed development located at 40 West Commercial Street in Portland, ME.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.64488761927891N70.2617886507607W



Counties: Cumberland, ME

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

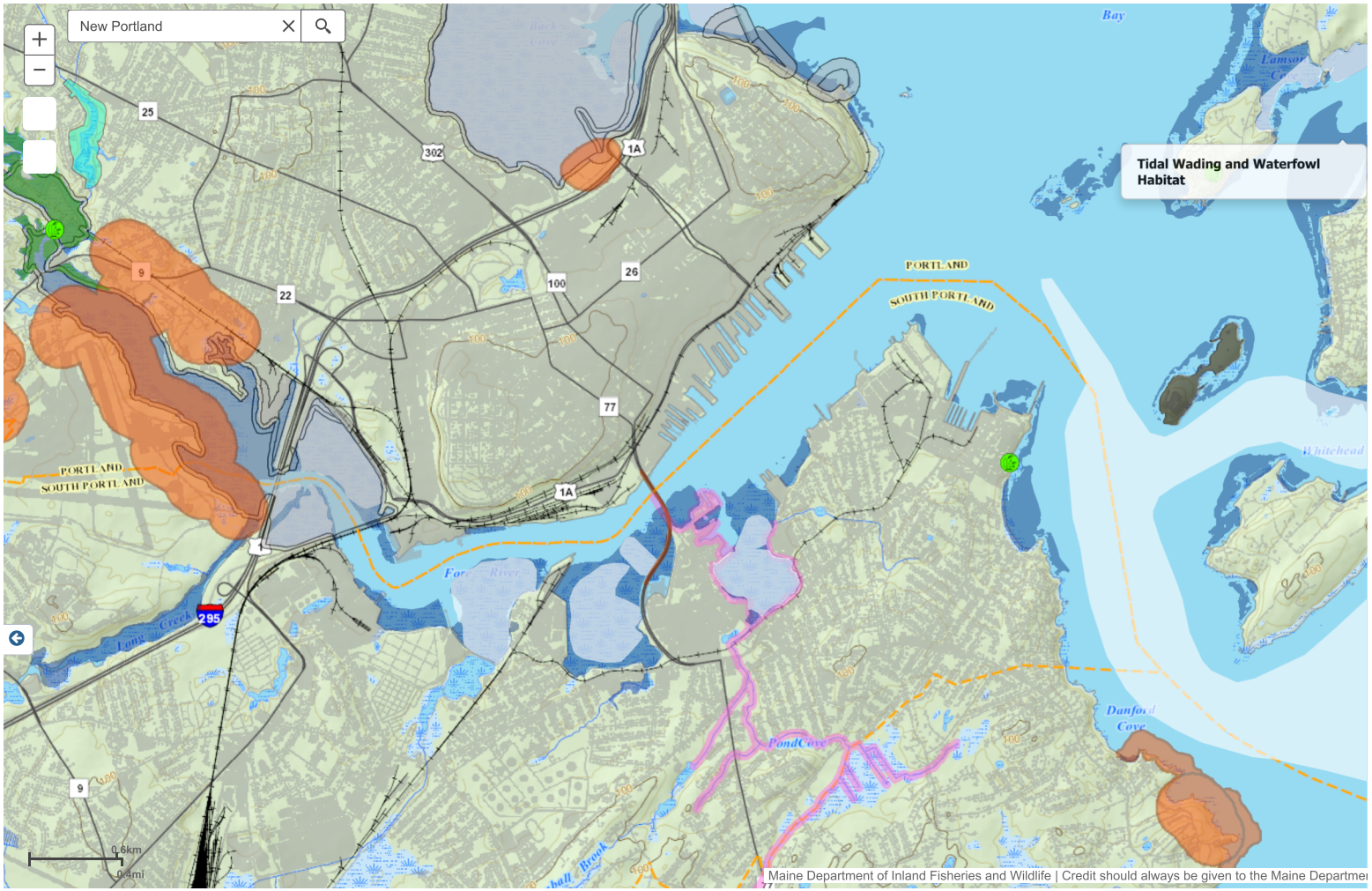
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Plant and Animal Habitats

Welcome Layers Legend

Legend:

- State Listed Animal Habitats
- Deer Wintering Areas
- Inland Wading Bird and Waterfowl Habitat
- Tidal Wading Bird and Waterfowl Habitat
- Essential Plover and Tern Habitat
- Shorebird Habitat
- Seabird Nesting Islands
- Significant Vernal Pools
- Rare Plant Locations
- Natural Communities
- Shellfish Beds
- Endangered Fish Species
- Wild Brook Trout Habitat
- Atlantic Salmon Spawning Habitat
- Atlantic Salmon Rearing Habitat



Maine Conserved Lands



9/26/2019, 1:34:29 PM

Maine Conserved Lands - All

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. Fish and Wildlife Service
National Wetlands Inventory

2019.09.26 Wetlands Map



September 26, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

February 25, 2020

Mr. Jedd Steinglass, LSP
Project Manager
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

Ref 4496

Re: Noise Modeling Analyses for SLODA- Compliance Demonstration

Dear Mr. Steinglass:

This letter report presents the results of an acoustic study for the proposed refrigeration facility located at 40 West Commercial Street, Portland, Maine (herein referred to as the Project). The proposed project is a total of 125,572 square feet, with 12 loading docks. The current Project location is a vacant lot that is located in a waterfront port development zone.

The acoustic modeling includes 32 residential receptors, and 3 property line receptors. Two modeling scenarios were performed:

1. daytime: which consists of up to 20 refrigerated trucks, 1 outdoor condenser, and
2. nighttime: which consists of having 10 refrigerated trucks, 1 outdoor condenser.

One-third octave bands were not available for the equipment data used in the model, so as per Maine DEP regulations a 5 dBA penalty was added to the predicted project sound levels.

The results of the acoustic study were compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy and the City of Portland Zoning Bylaw. **Tables 1** and **2** present the results from the model and demonstrate that the Proposed Project will comply with both the Maine DEP Noise Policy and the City of Portland Code of Ordinance.

1.0 THE DECIBEL SCALE FOR SOUND

All sounds originate with a source – a human voice, vehicles on a roadway, or an airplane overhead. The sound energy moves from the source to a person's ears as sound waves, which are minute variations of air pressure. The loudness of a sound depends on the sound pressure level, which has units of decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. On this scale, the quietest sound we can hear is 0 dB, while the loudest is 120 dB. Every 10-dB increase is perceived as a doubling of loudness. Most sounds we hear in our daily lives have sound pressure levels in the range of 30 dB to 90 dB.

Community noise studies and regulations use an A-weighting scale (dBA) when measuring sound pressure levels as this approximates the response of the human ear to sounds, we experience in everyday life. Typical sound levels associated with various activities and environments are presented in **Figure 1**. Here are examples of sound levels we all encounter. A quiet suburban area at night without any traffic typically has an average sound level of 40 to 45 dBA. The freight train you hear in the distance may be 50 dBA, and crickets and tree frogs in the summer sing a sound level of 55 dBA. Two people having a conversation in a normal tone of voice will hear each other speak at 65 dBA. Standing near a road, a car passing by can produce 75 dBA, and a truck passing by is louder at 80 dBA.

There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L_{90} metric, which is the sound level exceeded 90 percent of the time, is typically used. The L_{90} can also be thought of as the level representing the quietest 10 percent of any time period. The L_{10} metric, which is the sound level exceeded 10 percent of the time is typically used to assess transient noise highway or rail activities. The L_{eq}, or equivalent sound level, is the steady-state sound level over a period of time that has the same acoustic energy as the fluctuating sounds that actually occurred during that same period. It is commonly referred to as the average sound level. The L_{max}, or maximum sound level, represents the one second peak level experienced during a given time period. These are a broadband sound pressure measure, i.e., it includes sounds at all frequencies.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines eleven octave bands from 16 to 16,000 Hz.

2.0 APPLICABLE NOISE REGULATIONS

This section provides a summary of the Maine Department of Environmental Protection (Maine DEP) Noise Policy and the City of Portland Code of Ordinace.

2.1 Maine Department of Environnemental Protection Noise Policy

The Maine Department of Environmental Protection (Maine DEP) 06-096 Chapter 375 (10) Control of Noise. There are three criteria that could apply, the first is at the industrial fenceline, Chapter 375 (10) (1) (a) (i), and the second is at the fenceline of the residential locations, Chapter 375 (10) (1) (a) (ii). Both of these assume that the background is less than these limits. If the background is great than these limits because of existing background sound then the limit for the industrial fenceline, the residential fenceline, or possibly both could be an incremental increase Chapter 375 (10).

> *(1)(a)(i) At any property line of the development or contiguous property owned by the developer, whichever is farther from the proposed development's regulated sound sources:*
>
> *75 dBA at any time of day.*

(1)(a)(ii) At any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is not predominantly commercial, transportation, or industrial;

60 dBA between 7:00 a.m. and 7:00 p.m.
(the "daytime hourly limit"), and
50 dBA between 7:00 p.m. and 7:00 a.m.
(the "nighttime hourly limit").

Tech was provided with the "City of Portland Baseline Sound Monitoring Report" which included sound measurements taken near the project site, at Location: 10- Casco Bay Bridge, where the lowest measured day time and night time sound levels were 66 dBA and 57 dBA respectively. Location 3- Fore and Union, is a representative location for the residential area and the lowest measured day and nighttime sound levels where 60 DBA and 54 dBA.

Based on the provided Maine regulations "Notwithstanding the above, the developer need not measure or estimate the pre-development ambient hourly sound levels at a protected location if he demonstrates, by estimate for example, that the hourly sound levels resulting from routine operation of the development will not exceed 50 dBA in the daytime or 40 dBA at night" The pre- existing background of the project location and residential area are above 50 dBA (day) and 40 dBA (night). Which demonstrates that the developer does not need to take measurements and instead can used the limits presented in Chapter 375 (10) stated above.

2.2 City of Portland Code of Ordinace

The Project is located in a zoning area labeled as waterfront port development. The City of Portland Code of Ordinace Chapter 14 Sec. 14-320.3 states the following:

All uses in the waterfront port development zone shall comply with the following standards.

(b) Noise:

1. The level of sound, measured by a sound level meter with frequency weighting network (manufactured according to standards prescribed by the American National Standards Institute, Inc.), inherently and recurrently generated within the waterfront port development zone between the hours of 7:00 p.m. and 7:00 a.m. from industrial facilities or operation commenced on or after July 1, 1988, shall not exceed fifty-five (55) decibels on the A scale at or within the boundaries of any residential zone, except for sound from construction activities, sound from traffic on public streets, sound from temporary activities such as festivals, and sound created as a result of, or relating to, an emergency, including sound from emergency warning signal devices.

To comply with the City of Portland Code of ordinance the proposed project predicted sound levels cannot exceed fifty-five (55) decibels on the A scale at or within the boundaries of any residential zone.

3.0 ACOUSTIC MODELING APPROACH AND RESULTS

This section provides a summary of the acoustic modeling approach and results.

3.1 Acoustic Modeling Approach

The future sound levels from the Project, when it is producing maximum electrical power, were calculated with the Cadna/A acoustic model. Cadna/A is a three-dimensional model for sound propagation and attenuation based on International Standard ISO 9613[1]. Atmospheric absorption, the process by which sound energy is absorbed by the air, was calculated using ANSI S1.26-1995.[2] Digital terrain data for the Project areas were analyzed to obtain terrain heights. The model assumes the most-favorable sound propagation conditions, as occur under downwind conditions or during a ground-based temperature inversion on a clear night. Under these atmospheric conditions, sound travels further than if a person is upwind from a source and the atmosphere is well mixed, which would dampen the sound. Tech used refrigerated truck sound data from past noise projects to model twenty (20) refrigerated trucks for the daytime, and ten (10) refrigerated trucks during the nighttime, and was provided sound data to model one (1) condenser. A safety factor of 2 dBA was added onto each sound source.

Figure 2 shows modeling receptors included in Cadna/A representing both the residential and property line receptors.

3.2 Acoustic Modeling Results

Presented in this section is the predicted daytime and night sound levels for the Project and a comparison of compliance to the Maine DEP Noise Policy and Portland Noise Bylaw. Attachment A presents the acoustic modeling results.

Table 1 presents the predicted project daytime and nighttime sound levels, and one-third octave bands were not available for the equipment data used in the model, as per Maine DEP regulations a 5 dBA penalty was added to the predicted project sound levels. The predicted sound level increases were zero decibels above daytime and nighttime sound levels limits. The predicted project sound levels compared to the City of Portland noise limits are presented in **Table 2**, the predicted sound level increases were zero decibels above daytime and nighttime sound level limits.

Decibel-level contour maps of the predicted Project daytime and nighttime sound levels are presented in **Figures 3 and 4**.

[1] International Standard, ISO 9613-2, Acoustics – Attenuation of Sound During Propagation Outdoors, -- Part 2 General Method of Calculation.
[2] American National Standards Institute, ANSI S1.26-1995, "American National Standard Method for the Calculation of the Absorption of Sound by the Atmosphere," 1995.

Table 1:
Predicted Project Sound Levels Compliance with Maine DEP Noise Limits

Receptor #	Address	Predicted Project Sound Levels (dBA)		Predicted Project Sound Levels (dBA) with additionial 5 dBA for Tonal Sound		Maine DEP Noise Limits (dBA)		Compliance	
		Day	Night	Day	Night	Day	Night	Day	Night
1	65 Summer St 1FL	34	33	39	38	60	50	Yes	Yes
2	65 Summer St 2FL	34	33	39	38	60	50	Yes	Yes
3	51 Summer St 1FL	34	33	39	38	60	50	Yes	Yes
4	51 Summer St 2FL	34	33	39	38	60	50	Yes	Yes
5	49 Summer St 1FL	34	32	39	37	60	50	Yes	Yes
6	49 Summer St 2FL	34	33	39	38	60	50	Yes	Yes
7	45 Summer St 1FL	32	30	37	35	60	50	Yes	Yes
8	45 Summer St 2FL	33	32	38	37	60	50	Yes	Yes
9	33 Summer St 1FL	30	28	35	33	60	50	Yes	Yes
10	33 Summer St 2FL	31	29	36	34	60	50	Yes	Yes
11	28 Summer St 1FL	28	26	33	31	60	50	Yes	Yes
12	28 Summer St 2FL	29	27	34	32	60	50	Yes	Yes
13	265 York St 1FL	29	27	34	32	60	50	Yes	Yes
14	265 York St 2FL	32	30	37	35	60	50	Yes	Yes
15	78 Salem St 1FL	32	31	37	36	60	50	Yes	Yes
16	78 Salem St 2FL	33	32	38	37	60	50	Yes	Yes
17	82 Salem St 1FL	34	33	39	38	60	50	Yes	Yes
18	82 Salem St 2FL	35	35	40	40	60	50	Yes	Yes
19	90 Salem St 1FL	33	32	38	37	60	50	Yes	Yes
20	90 Salem St 2FL	34	33	39	38	60	50	Yes	Yes
21	84R Salem St 1FL	31	30	36	35	60	50	Yes	Yes
22	84R Salem St 2FL	32	32	37	37	60	50	Yes	Yes
23	88 Salem St 1FL	31	29	36	34	60	50	Yes	Yes
24	88 Salem St 2FL	32	32	37	37	60	50	Yes	Yes
25	263 York St 1FL	29	27	34	32	60	50	Yes	Yes
26	263 York St 2FL	31	29	36	34	60	50	Yes	Yes
27	259 York St 1FL	28	26	33	31	60	50	Yes	Yes
28	259 York St 2FL	30	28	35	33	60	50	Yes	Yes
29	251 York St 1FL	28	26	33	31	60	50	Yes	Yes
30	251 York St 2FL	29	27	34	32	60	50	Yes	Yes
31	24 Brackett St 1FL	28	26	33	31	60	50	Yes	Yes
32	24 Brackett St 2FL	30	27	35	32	60	50	Yes	Yes
33	Property Line Receptor 1	56	56	61	61	75	75	Yes	Yes
34	Property Line Receptor 2	42	39	47	44	75	75	Yes	Yes
35	Property Line Receptor 3	69	64	74	69	75	75	Yes	Yes

Table 2:
Predicted Project Sound Levels Compliance with City of Portland Noise Limits

Receptor #	Address	Predicted Project Sound Levels (dBA)		City of Portland Noise Limits (dBA)		Compliance	
		Day	Night	Day	Night	Day	Night
1	65 Summer St 1FL	34	33	55	55	Yes	Yes
2	65 Summer St 2FL	34	33	55	55	Yes	Yes
3	51 Summer St 1FL	34	33	55	55	Yes	Yes
4	51 Summer St 2FL	34	33	55	55	Yes	Yes
5	49 Summer St 1FL	34	32	55	55	Yes	Yes
6	49 Summer St 2FL	34	33	55	55	Yes	Yes
7	45 Summer St 1FL	32	30	55	55	Yes	Yes
8	45 Summer St 2FL	33	32	55	55	Yes	Yes
9	33 Summer St 1FL	30	28	55	55	Yes	Yes
10	33 Summer St 2FL	31	29	55	55	Yes	Yes
11	28 Summer St 1FL	28	26	55	55	Yes	Yes
12	28 Summer St 2FL	29	27	55	55	Yes	Yes
13	265 York St 1FL	29	27	55	55	Yes	Yes
14	265 York St 2FL	32	30	55	55	Yes	Yes
15	78 Salem St 1FL	32	31	55	55	Yes	Yes
16	78 Salem St 2FL	33	32	55	55	Yes	Yes
17	82 Salem St 1FL	34	33	55	55	Yes	Yes
18	82 Salem St 2FL	35	35	55	55	Yes	Yes
19	90 Salem St 1FL	33	32	55	55	Yes	Yes
20	90 Salem St 2FL	34	33	55	55	Yes	Yes
21	84R Salem St 1FL	31	30	55	55	Yes	Yes
22	84R Salem St 2FL	32	32	55	55	Yes	Yes
23	88 Salem St 1FL	31	29	55	55	Yes	Yes
24	88 Salem St 2FL	32	32	55	55	Yes	Yes
25	263 York St 1FL	29	27	55	55	Yes	Yes
26	263 York St 2FL	31	29	55	55	Yes	Yes
27	259 York St 1FL	28	26	55	55	Yes	Yes
28	259 York St 2FL	30	28	55	55	Yes	Yes
29	251 York St 1FL	28	26	55	55	Yes	Yes
30	251 York St 2FL	29	27	55	55	Yes	Yes
31	24 Brackett St 1FL	28	26	55	55	Yes	Yes
32	24 Brackett St 2FL	30	27	55	55	Yes	Yes

4.0 CONCLUSION

Tech performed an acoustic modeling study for the proposed refrigeration facility located at 40 West Commercial Street. The future sound levels from the Project, were calculated with the Cadna/A acoustic model. The model included twenty (20) refrigerated trucks for the daytime, and ten (10) refrigerated trucks during the nighttime, and one (1) condenser; and 32 residential receptors, and 3 property line receptors. One-third octave bands were not available for the equipment data used in the model, so as per Maine DEP regulations a 5 dBA penalty was added to the predicted project sound levels.

The study demonstrated that because the pre-existing sound levels are in the 50-60 dBA range for day time and nighttime sound levels, the Project operations will not cause an increase in the existing sound levels. The results of the acoustic study were then compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy and the City of Portland Zoning Bylaw. If Project includes the equipment that were modeled and the surrounding area does not have a pre-existing tonal sound, there would be no observed tonal sounds predicted at the site property lines or the residential receptors. Therefore, the Projects will comply with both the Maine DEP Noise Policy and the City of Portland Code of Ordinace.

Please call if you have any questions regarding this report.

Sincerely,

TECH ENVIRONMENTAL, INC.



Michael T. Lannan, P.E.
President
4496/ Letter Report December 2019

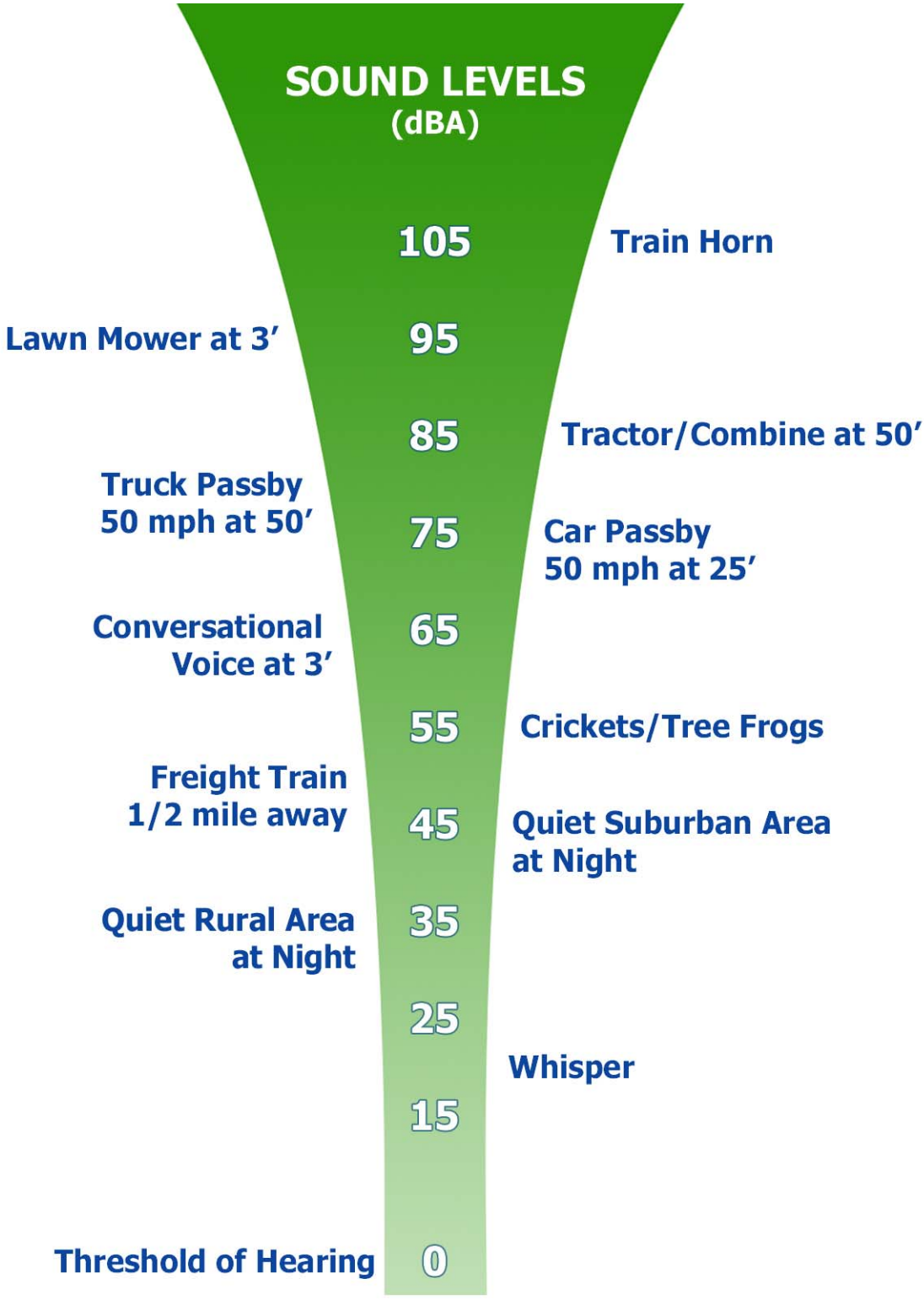


FIGURE 1.
Common Outdoor Sound Levels

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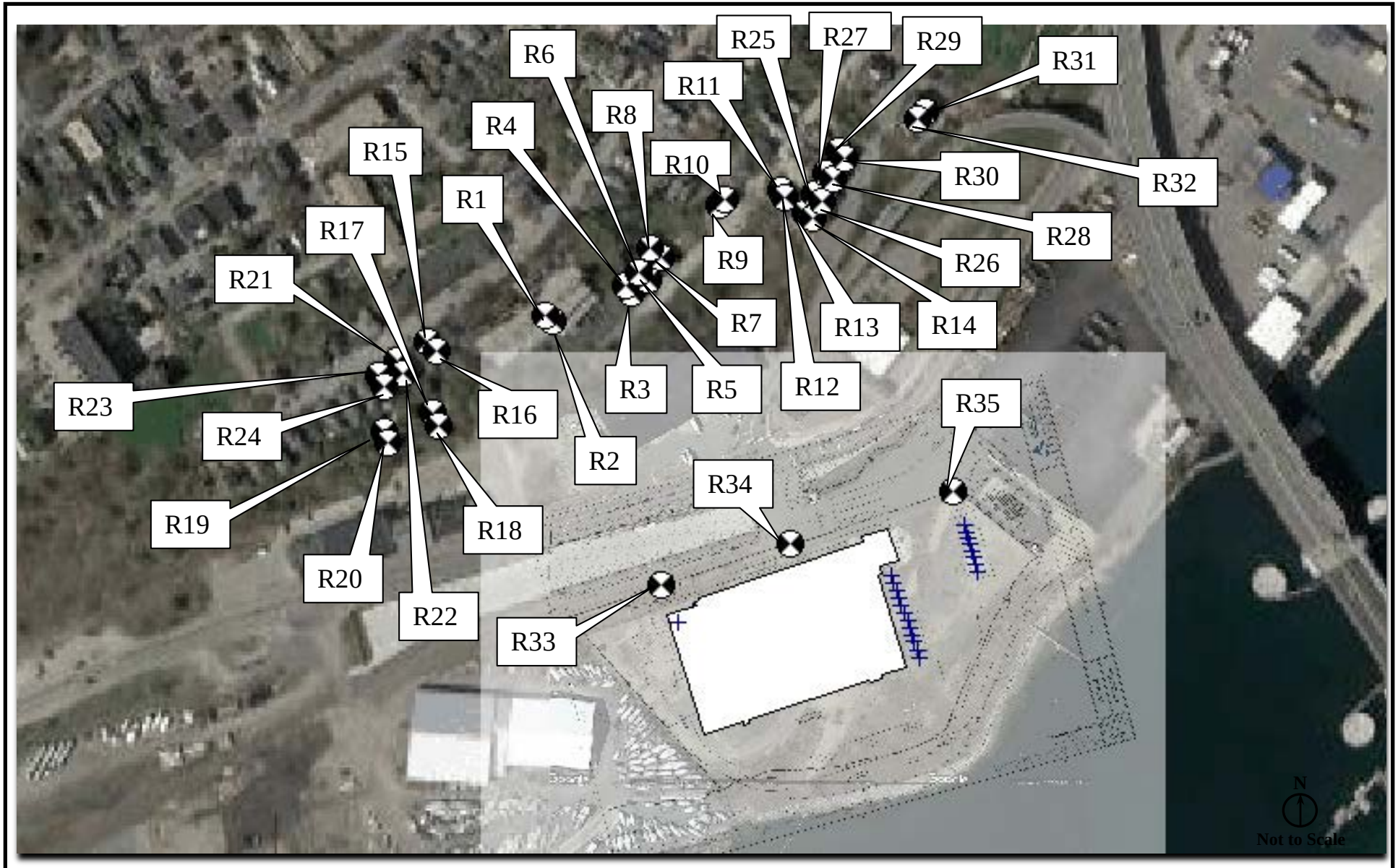

FIGURE 2.
Modeling Receptors Location
40 West Commercial Street, Portland, ME

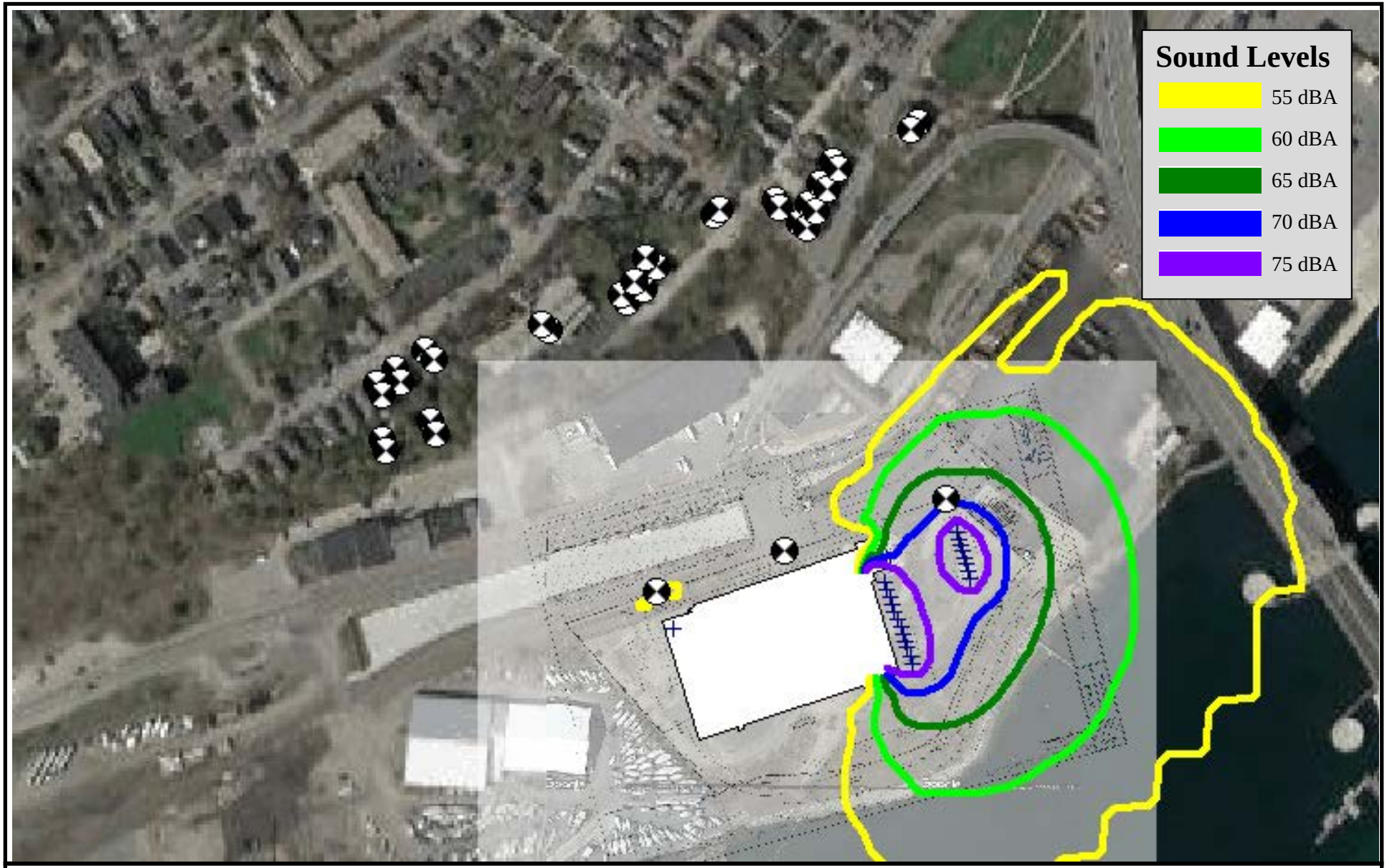

FIGURE 3.
Daytime Predicted Sound Levels
40 West Commercial Street, Portland, ME

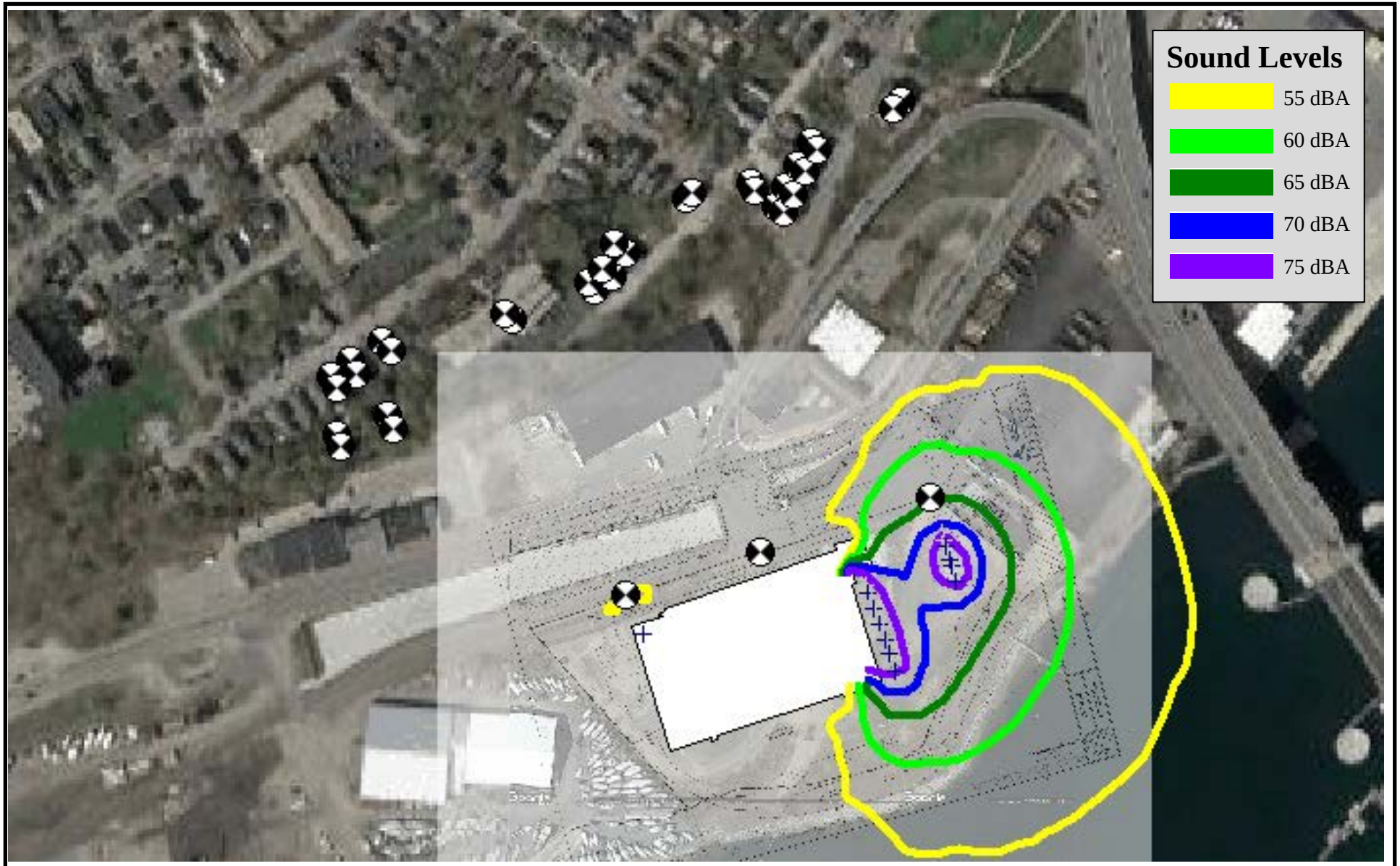

FIGURE 3.
Nighttime Predicted Sound Levels
40 West Commercial Street, Portland, ME

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
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TEL (207) 443-5447

Main Port Authority Cold Storage Facility
Portland, Maine March 2, 2020

PROPOSED SITE LIGHTING

Basis of Site Lighting Design

The *Illuminating Engineering Society of North America* (*IESNA*) published recommended lighting standards for marine port facilities in RP-40-19 Recommended Practice: Lighting Port Terminals. RP-40-19 recommends the following horizontal illuminance levels:

Average Illuminance at Grade:	3.5 footcandles
Minimum Illuminance at Grade:	1.0 footcandle
Maximum-to-Minimum Uniformity Ratio:	6.0-to-1 or less

Section 12 of the City of Portland Technical Manual stipulates the following illuminance design criteria:

Average Illuminance at Grade:	1.25 footcandles
Minimum Illuminance at Grade:	0.2 footcandle
Maximum Illuminance at Grade:	5.0 footcandles
Maximum-to-Minimum Uniformity Ratio:	20.0-to-1 or less

Additionally, The Technical Manual stipulates that the maximum lighting pole height for large industrial facilities (> 50,000 SF) be not greater than 30-feet.

The proposed site lighting design has been prepared to provide user safety while respecting reasonable design criteria. The requirement to keep the marine port loading/unloading and dock vehicle areas clear of lighting poles makes the lighting layout a challenge given the width of the paved area. Lighting for this area is proposed to consist of lighting poles along the perimeter of the paved area, as well as building mounted lighting. The following design criteria serve as the basis for the site lighting design:

- Illuminance Levels:
  - Parking Lot and Access Drives

Average Illuminance at Grade:	1.25 footcandles
Minimum Illuminance at Grade:	0.2 footcandle
Maximum Illuminance at Grade:	5.0 footcandles
Maximum-to-Minimum Uniformity Ratio:	20.0-to-1 or less

  - Marine Cold Storage Loading/Unloading Area

Average Illuminance at Grade:	2.5 footcandles
Minimum Illuminance at Grade:	0.75 footcandle
Maximum Illuminance at Grade:	5.0 footcandles
Maximum-to-Minimum Uniformity Ratio:	6.0-to-1 or less

- Mounting Heights
  - Parking Lot and Access Drives
    - Lighting Poles: 20-feet (maximum)
    - Building Mounted Lights: 20-feet (maximum)
  - Marine Cold Storage Loading/Unloading Area
    - Lighting Poles: 30-feet (maximum)
    - Building Mounted Lights: 30-feet (maximum)

Requirements for site lighting are addressed by the City of Portland in two documents: The City of Portland, Maine - Code of Ordinances, and the City of Portland - Technical Manual. Listed below are the issues pertaining to the proposed site lighting as relates to the two city documents.

The City of Portland - Maine Code of Ordinances

Chapter 14 – Land Use
Article V Site Plan
14-526.6 Exterior Lighting

a. Site Lighting

(i) All exterior site lighting, including lighting of building entrances, shall be full cut-off with no light emitted above the horizontal plane or spilled onto adjacent properties and streets. Illumination levels shall be adequate but not excessive for safety, comfort and convenience of occupants and users of the site and shall conform to applicable standards of Section 12 of the Technical Manual.

RESPONSE: The *Illuminating Engineering Society of North America* (*IESNA*) classifies exterior luminaires in the publication *IESNA* TM-15-11 according to their potential for producing uplight. The rating system is a numeric index that ranges from zero (no uplight) to five (greater than 1000 lumens uplight. All of the proposed site lighting luminaires are classified as having an uplight rating of (U0) Zero Uplight Component.

14-526.6 Exterior Lighting

a. Site Lighting

(ii) For major or minor site plans within or abutting a residential use or zone where light from the proposed development may adversely impact adjacent residential properties, exterior lighting shall employ house-side shielding.

RESPONSE: Not applicable (project does not abut a residential zone)

The City of Portland Technical Manual

Section 12 Site Lighting Standards

12.3 General Standards

Outdoor lighting standards listed below apply to all new developments.12.3.

1. *Uniformity: As measured in foot candles at grade, maximum-to-minimum illumination levels shall not exceed a ratio of twenty (20) to one (1.).*

RESPONSE: The maximum-to-minimum illumination ratio for the proposed site lighting is:

- Access Drives 11.0-to-1
- Parking Lot 3.0-to-1
- Marine Loading/Unloading Area 6.0-to-1

---

2. *Illumination Levels: Minimum, Maximum, and Average illumination levels for areas intended to be lighted, as measured at grade, shall be:*

Minimum	*0.2 footcandles (fc*
Maximum	*5.0 footcandles (fc)*
Average	*1.25 footcandles (fc)*

RESPONSE: The illumination levels for the proposed site lighting are as follows:

- Front Access Drive:
  - Average Illuminance at Grade: 1.2 footcandles
  - Minimum Illuminance at Grade: 0.6 footcandle
  - Maximum Illuminance at Grade: 2.2 footcandles

- Rear Access Drive:
  - Average Illuminance at Grade: 1.2 footcandles
  - Minimum Illuminance at Grade: 0.3 footcandle
  - Maximum Illuminance at Grade: 5.0 footcandles
- West Parking Lot:
  - Average Illuminance at Grade: 1.2 footcandles
  - Minimum Illuminance at Grade: 0.7 footcandle
  - Maximum Illuminance at Grade: 1.9 footcandles
- Overall Marine Port Loading/Unloading Area:
  - Average Illuminance at Grade: 2.6 footcandles
  - Minimum Illuminance at Grade: 1.0 footcandle
  - Maximum Illuminance at Grade: 4.9 footcandles
- Loading/Unloading Docks Area:
  - Average Illuminance at Grade: 3.0 footcandles
  - Minimum Illuminance at Grade: 1.4 footcandle
  - Maximum Illuminance at Grade: 4.9 footcandles

The proposed minimum and maximum illuminance levels conform to the 12.3.2 standard. The average illuminance at the marine port loading/unloading area exceeds the 1.25 footcandle criteria as stipulated in the City Technical Manual. The average illuminance in this area is proposed as being necessary to promote the safety of loading/unloading activities.

---

3. *Lumens: No fixture shall exceed 20,000 lumens (+/- 3%)*

Types of Lighting	Maximum Lumens Allowed
Building Entrance	3,500 lumens

RESPONSE: The lumen ratings of the proposed site lighting luminaires at building entrances are all less than 3,500 lumens. The lumen rating of the proposed site lighting luminaires along the access drives, and at the parking lot are less than 20,000 lumens.

- Fixture Type S1A 2,846 lumens
- Fixture Type S2A 1,424 lumens
- Fixture Type S2B 9,300 lumens
- Fixture Type S4A 5,492 lumens
- Fixture Type S4B 5,492 lumens
- Fixture Type S4C 5,492 lumens

The lumen rating of the pole lights (Types S4D and S4E) that illuminate the marine port loading/unloading area exceed 20,000 lumens. Although this exceeds the 12.3.3 standard it is suggested that this is appropriate considering the potential for user safety at these areas.

- Fixture Type S4D 25,913 lumens
- Fixture Type S4E 24,280 lumens

---

4. *Light Trespass: The maximum illumination level at a property line shall not exceed 0.1-foot candle, as measured at grade, except where abutting industrial, or other non-sensitive uses. When a commercial or industrial use abuts a public right-of-way, or another commercial or industrial use, lighting must be designed so that the illumination at the property boundary line does not exceed 1.0 foot-candles.*

RESPONSE: No illuminance level across the property line exceeds 0.1 footcandle.

---

5. *Luminaire Types: All fixtures must be LED and shall not exceed 3000K Correlated Color Temperature (CCT). Screw in light fixtures must have LED lamp specified to be maximum of 3000K CCT.*

RESPONSE: All proposed light fixtures utilize LED lamps with 3000K CCT.

---

6. *Full Cut-off Fixtures and Shielding Required: All outdoor lighting fixtures, including pole mounted and wall mounted luminaires, shall be constructed Full "cut-off" or with full shielding, type where lenses, refractors or lamp sources do not extend below the surface of the fixture housing and no direct light shall be directed at or above the horizontal plane.*

   Where the light source from an outdoor light fixture is visible beyond the property line, shielding shall be required to reduce glare so that the light source is not visible from within any residential dwelling unit.

   Light fixtures mounted under a canopy shall be recessed to that the lens cover is recessed into, or flush with, the underside (ceiling) of the canopy.

RESPONSE: All proposed site lighting luminaires are classified as "full cut-off". The construction of the proposed canopies does not allow for recessed light fixtures. The proposed canopy-mounted light fixtures (Type S1A) are surface mounted on the underside of entrance canopies, and they include flush lenses that do not project below the fixture housing.

---

8. *Fixture Height: Fixtures shall be mounted at the lowest height necessary to meet city standards and the height is measured from grade to the bottom of the light fixture.*

Type of Lighting	Maximum Fixture Height
Residential (Pedestrian) Uses	20 feet
Commercial/ Office Uses	20 feet
Large Industrial Uses (50,000 sf or more- gross floor area)	30 feet
Building Mounted/ Entrances	below the roof eave and not to exceed 20 feet, whichever is lower
Bollard Fixtures	42 inches (3.5 feet)

RESPONSE: The maximum height of proposed site lighting fixtures at access drives, the parking lot, and at entrance/exit doors is less than 20 feet. The maximum height of proposed site lights at the marine port loading/unloading area is 30 feet.

---

9. *Lighting Curfew: For surface and structured parking, lighting in vehicle parking areas containing twenty (20) or more parking spaces shall be reduced to 50% of permitted levels from one hour after business closing to one hour before business opening. If lighting levels are already below 50% of permitted levels, no curfew adjustment is required. Motion sensor activated lighting shall be permitted during closing hours to activate additional lighting above the 50% permitted, for the purposes of public safety.*

RESPONSE: The facility operation extends 24 hours per day. Accordingly, it is proposed that the site lighting be operational for all hours from dusk until dawn.

---

10. *Continued Maintenance: Lighting installations must be maintained in good repair to meet the provisions of this ordinance on an on-going basis.*

RESPONSE: All proposed lighting will be maintained in full working order.

---

11. *General Exceptions: proposed uses that demonstrate a need to exceed the specific site lighting limits shown below for safe and reasonable exercise of the proposed use must provide a professionally produced lighting plan which adheres to the current Illuminating Engineering Society of North America (IESNA) recommendations for the proposed use. The planning Authority may grant exceptions to the lighting standards with the finding that the light impacts do not create a public nuisance for abutting residential property. Unless otherwise specified below, exterior lighting shall conform to the recommendations put forth in Lighting for Exterior Environments RP-33-14, or its successor, published by the Illuminating Engineering Society of North America (IESNA). Lighting fixtures other than full cut-off fixtures*

may be allowed only if acceptable luminaires shall include internal and/or external glare control louvers and installed so as to minimize uplight and offsite light trespass.

RESPONSE: The proposed lighting conforms to the recommendations published in Lighting for Exterior Environments RP-33-14

The following exceptions to the City of Portland Technical Manual are requested:

- Paragraph 12.3.2
  Proposed average illuminance at the marine port loading/unloading area:
  3.0 footcandles
- Paragraph 12.3.3
  Proposed lumen rating for Type S4D pole lights at the marine port loading/unloading area:
  25,913 lumens

- Paragraph 12.3.3
  Proposed lumen rating for Type S4E pole lights at the marine port loading/unloading area:
  24,280 lumens

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TEL (207) 443-5447

Maine Port Authority Cold Storage Facility

Portland, Maine
March 2, 2020

PROPOSED SITE LIGHTING LUMINAIRES AND LIGHTING POLES

TYPE S1A: UNDER-CANOPY LIGHTS WITH AN IES TYPE 5QW DISTRIBUTION PATTERN.

TYPE S1B: UNDER-CANOPY LIGHTS WITH AN IES TYPE 5C DISTRIBUTION PATTERN.

TYPE S2A: WALL LIGHTS ABOVE ENTRANCE/EXIT DOORS.

TYPE S2B: WALL LIGHTS ILLUMINATING THE MARINE PORT LOADING/UNLOADING AREA.

TYPE S4A: POLE LIGHT WITH 18-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 6-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 24" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 3 DISTRIBUTION PATTERN AND WILL BE DIMMED TO 70% RATED OUTPUT.

TYPE S4B: POLE LIGHT WITH 18-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 6-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 24" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4 DISTRIBUTION AND WILL BE DIMMED TO 70% RATED OUTPUT.

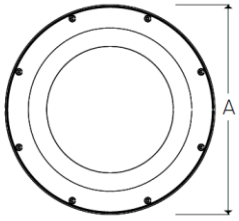
TYPE S4C: POLE LIGHT WITH 16-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 30-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 24" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION PATTERN AND WILL BE DIMMED TO 70% RATED OUTPUT.

TYPE S4D: POLE LIGHT WITH 25-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 48-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 96" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION.

TYPE S4E: POLE LIGHT WITH 25-FOOT TALL POLE INSTALLED ON A CONCRETE FOUNDATION BASE WITH 48-INCHES OF THE BASE EXPOSED ABOVE GRADE. THE LIGHTING POLE TO INCLUDE A 96" BRACKET ARM. THE LUMINAIRE WILL HAVE AN IES TYPE 4W DISTRIBUTION.

SRT1 EDGE-LIT





A	B	Weight
12" (304mm)	3.1" (78mm)	8lbs (3.6kg)

- For ceiling mount and parking garage applications from an 8–15 foot mounting height
- Edge-lit flat lens for optimal visual comfort and uniformity across the lens
- Two optical distributions specifically design for parking garage and canopy applications are available making the Beacon Edge-Lit luminaire both versatile and functional
- UL/cUL listed for we locations, IP65 and 3G vibration rated
- Occupancy sensor available for complete on/off and dimming operation

HOUSING

- Die-cast aluminum housing ensures long electrical component life and luminaire performance
- Corrosion resistant powder coat finish both protects and provides architectural appearance
- One piece molded silicone gasket ensures weather proof seal
- Thermally isolated driver mounted to dedicated bracket reduces operating temperatures and increases driver life and reliability

OPTICS

- Edge-lit acrylic light guide provides blended non-pixelated light for unprecedented visual comfort
- Choice of multiple light outputs with lumen range of 2500–6000
- Two distribution types: Type 5 Square Wide, Type 5 Concentrated
- Wide variety of CCT's and CRI's offered: 3000K (70CRI), 3000K (80CRI), 3500K (80CRI), 4000K (70CRI), 4000K (80CRI) or 5000K (70 CRI) CCT

Series	
SRT1	Edge-Lit Parking Garage Size 1

Engine	
20	20W Nominal 2500 lm
35	35W Nominal 4000 lm
55	55W Nominal 6000 lm

CCT	
3K7	3000K, 70 CRI
3K8	3000K, 80 CRI
35K7	3500K, 80 CRI
4K7	4000K, 70 CRI
4K8	4000K, 80 CRI
5K7	5000K, 70 CRI

Distribution	
5QW	Type 5 Square Wide
5C	Type 5 Concentrated

Voltage	
UNV	120V-277V
120	120V
208	208V
240	240V
277	277V

Color/Finish	
BL	Textured Black
DB	Textured Dark Bronze
GT	Graphite Textured
GYS	Smooth Gray
PS	Smooth Plat. Silver

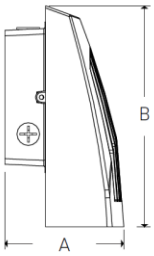
Nominal Watts	Nominal Lumens	Distribution	5K (5000K NOMINAL 70 CRI)					4K (4000K NOMINAL 70 CRI)					3K (3000K NOMINAL 70 CRI)				
			Lumens	LPW	B	U	G		LPW	B	U	G	Lumens	LPW	B	U	G
20	3000	5C	3093	136.86	1	0	1	3078	136.21	1	0	1	2960	130.97	1	0	1
		5QW	2974	131.60	1	0	1	2960	130.97	1	0	1	2846	125.93	1	0	1

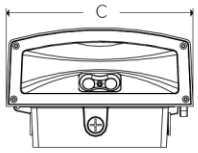
Type S1A: 5QW Distribution; **Type S1B:** 5C Distribution

SLING SERIES



SG1





A	B	C	Weight
4.19" (107mm)	7.80" (198mm)	6.61" (168mm)	4.4lbs (2kg)

- SG1 Series replaces from 100W-150W HID; SG2 Series replaces from 150W-250W HID
- Comfort lens available as an option or accessory provides glare control and enhanced uniformity
- Knuckle and trunnion accessory mounting kits available for flood applications
- IP65 and certified to UL 1598 for use in wet locations up to 40°C ambient
- DLC (DesignLights Consortium Qualified - see www.designlights.org

HOUSING

- Rugged die-cast aluminum housing with corrosion resistant powder coat finish
- Heating dissipating fins provide superior thermal performance extending the life of the electronic components
- Impact resistant tempered glass offers zero uplight
- Comfort lens available as an option or accessory to reduce glare (7-10% lumen reduction) and provide better uniformity

OPTICS

- 3000K, 4000K and 5000K CCT nominal with 70 CRI
- Smaller SG1 housing has 2 LEDs, larger SG2 housing has 3 LEDs

Housing	
SG1-10	Size 1, 10W
SG1-20	Size 1, 20W
SG1-30	Size 1, 30W
SG1-40	Size 1, 40W
SG2-50	Size 2, 50W
SG2-80	Size 2, 80W

CCT/CRI	
3K7	3000K, 70 CRI
4K7	4000K, 70 CRI
5K7	5000K, 70 CRI

Distribution	
FT	Fwd Throw

Voltage	
UNV	120V-277V
120	120V
277	277V
UHV	347V-480V

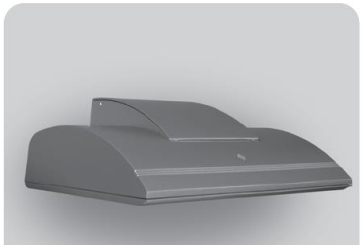
Color/Finish	
DB	Textured Dark Bronze
BL	Textured Black
WH	Textured White
GYS	Smooth Gray
PS	Smooth Plat. Silver
CC	Custom Color

Control Options	
PCU	Universal Button Photocontrol (120-277V)
SCP[1,2,3]	Occupancy Sensor Programmable (Dim)
SWP[1,2]	SiteSync Pre-commission
SWPM[1,2]	SiteSync Pre-commission w/ Sensor
Specify MTG HT for SCO/SCP & SWPM	
8F	Up to 8'
20F	Up to 20'

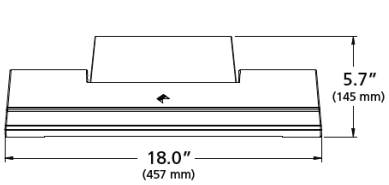
Options	
CS	Comfort Lens
E[1,2]	Battery 0°C
EH[1,2]	Battery w/ heater -20°

Description	# of LEDs	Drive Current	System Watts	5K (5000K NOMINAL 70 CRI)					4K (4000K NOMINAL 70 CRI)					3K (3000K NOMINAL 80 CRI)				
				Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
SG1-10	2	140mA	11	1349	122	1	0	0	1424	129	1	0	0	1003	91	1	0	0
SG1-20	2	250mA	21	2449	115	1	0	0	2310	110	1	0	0	2054	95	1	0	0

HUBBELL Outdoor Lighting



Wall Director® Medium



Housing

- Optical housing is a one-piece, die-cast low copper (<0.6%) aluminum alloy with integral heat sink. The housing rotates against mounting arm housing to provide -5° to 10° of adjustment with degree markers cast into the housing. At 0° adjustment, lens is totally concealed from view above horizontal with fixture mounted in the downward position.
- Mounting arm housing is one-piece die-cast, low copper (<0.6%) aluminum alloy with provisions for tilt mechanism. Mounting arm fastens to the mounting plate with keyhole slots freeing both hands for securing and wiring. One stainless steel socket-head screw on the tilt mechanism frees the optical housing to rotate for aiming. Tightening the screws locks the housing and lens frame together with sealing provided by a silicone gasket. For visual aiming, adjustment may be accomplished with the fixture on.
- Lens Frame is a one-piece, die-cast low copper (<0.6%) aluminum alloy with integral cooling fins to dissipate driver thermal.
- Luminaire housing shall be free of any visible heat fins, hardware or fasteners.
- Bracketry and hardware shall be stainless steel.

Specifications

- Luminaire shall be capable of operating at 100% brightness in a 40°C environment. Both driver and optical array shall have integral thermal protection that will dim the luminaire upon detection of temperatures in excess of 85°C.
- Luminaires not configured with a control system shall be provided with 0-10 purple and gray dimming leads.

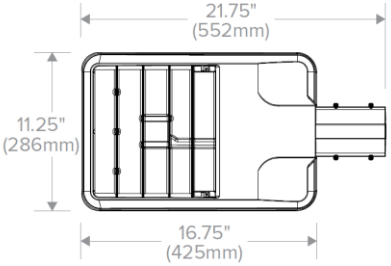
Fixture	Mounting	Source	Wattage	Light Engine	Distribution	Voltage
WDM Wall Director Medium	D Down	48L 48 LEDs	55 55 Watts	3K7 3000K/70CRI	1 Type I	UNV 120-277V
	U[1] Up		65 65 Watts	3K8 3000K/80CRI	2 Type II	347 347V
			85 85 Watts	4K7 4000K/70CRI	3 Type III	480 480V
			105 105 Watts	4K8 4000K/80CRI	4W Type IV Wide	
			130 130 Watts	5K7 5000K/70CRI	4F Type IV Forward	
					WG[2] Wall Graze	
					SP Spot/Column	
					FTD[2] Forward Throw Diffuse	
					WTD[2] Wide Throw Diffuse	

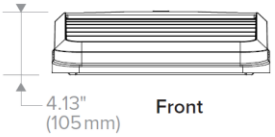
LED #	Nominal Lumen Package	Nominal Wattage	Lens Options	Distribution	3000K					4000K					5000K				
					Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w	Lumen	BUG Rating			lm/w
						B	U	G			B	U	G			B	U	G	
48L	10,000	88	Clear Lens	1	11194	1	0	1	127	11476	1	0	1	130	11607	1	0	1	132
				2	10601	2	0	2	120	10867	2	0	2	123	10991	2	0	2	125
				3	10779	1	0	2	122	11050	1	0	2	126	11177	1	0	2	127
				4F	10576	1	0	2	120	10842	1	0	2	123	10966	1	0	2	125
				4W	10285	2	0	2	117	10544	2	0	2	120	10665	2	0	2	121
				SP	11870	5	0	1	135	12168	5	0	1	138	12308	5	0	1	140
			Diffuse Lens	WG	10695	3	0	1	122	10964	3	0	1	125	11090	3	0	1	126
				FTD	9300	2	0	2	106	9534	2	0	2	108	9643	2	0	2	110
				WTD	10065	2	0	2	114	10318	2	0	2	117	10436	2	0	2	119

KIM LIGHTING

VIPER S







CONSTRUCTION

- Manufactured with die cast aluminum
- Coated with a polyester finish that meets ASTM B117 corrosion test requirements and ASTM D522 cracking and loss of adhesion test requirements
- IFS polyester powder-coat electrostatically applied and thermocured. IFS finish consists of a five stage pretreatment regimen with a polymer primer sealer and top coated with a thermoset super TGIC polyester powder coat finish
- The finish meets the AAMA 2604 performance specification which includes passing a 3,000-hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pounds
- External hardware is corrosion resistant

OPTICS

- Cartridge is held together with internal brass standoffs soldered to the board so that it can be field replaced as a one-piece optical system
- One-piece silicone gasket ensures a weatherproof seal around each individual optic
- One-piece optical cartridge system consisting of an LED engine, optics, gasket and stainless steel bezel

VPS –

Series	
VPS	Viper Small

LED Engine	
24L-55	55W, LED array
36L-65	65W, LED array
36L-80	80W, LED array
48L-110	110W, LED array
60L-136	136W, LED array

CCT/CRI[7]	
3K7	3000K, 70 CRI
4K7	4000K, 70 CRI
5K7	5000K, 70 CRI

Distribution	
FR	Type 1/Front Row
2	Type 2
3	Type 3
4	Type 4
4W	Type 4 Wide
5QM	Type 5QM

Rotation	
Blank	No rotation
L	Optic rotation left[5]
R	Optic rotation right[5]

Voltage	
UNV	120–277V
347	347V
480	480V

Mounting	
A	Rectangular Arm (formerly RA) for square or round pole
MAF	Mast Arm Fitter (formerly SF2) for 2⅜" OD horizontal arm
K	Knuckle (formerly PK2) limit to 30° tilt or 2⅜" OD horizontal arm or vertical tenon

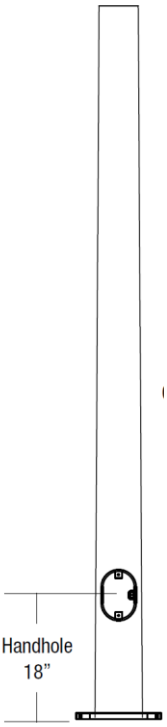
Color	
BL	Black Textured
DB	Dark Bronze Textured
GYS	Light Gray Smooth
PS	Platinum Silver Smooth

Control Options	
7PR	7-Pin Receptacle only (shorting cap, photo control, or wireless control provided by others)
7PR-SC	7-Pin Receptacle w/Shorting Cap
7PR-TL	7-Pin Receptacle w/Twist-Lock® photo control

DELIVERED LUMENS

# of LEDs	DRIVE CURRENT (mA)	SYSTEM WATTS	DISTRIBUTION TYPE	5K (5000K nominal, 70 CRI) LUMENS	LPW	B	U	G	4K (4000K nominal, 70 CRI) LUMENS	LPW	B	U	G	3K (3000K nominal, 70 CRI) LUMENS	LPW	B	U	G
24	700 mA	55W	FR	6357	118	1	0	1	6486	120	1	0	1	5804	107	1	0	1
			2	6132	114	1	0	1	6257	116	1	0	2	5599	104	1	0	1
			3	6015	111	1	0	2	6137	114	1	0	2	5492	102	1	0	2
			4	5921	110	1	0	2	6034	112	1	0	2	5400	100	1	0	2
			4W	5793	108	1	0	2	5909	110	1	0	2	5272	98	1	0	2

Type S4A: 3 Distribution; **Type S4B:** 4W Distribution; **Type S4C:** 4W Distribution



CONSTRUCTION

- SHAFT: One-piece tapered aluminum with round cross section, made of 6061-T6 shaft and 356-T6 cast aluminum base

GROUP 2

- ANCHOR BOLTS: Supplied with (4) galvanized anchor bolts with minimum yield of 55,000 psi (ASTM F1554). Galvanized hardware with two washers and two nuts per bolt for leveling
- BOLT COVER: Four individual bolt covers provided
- POLE CAP: Pole shaft supplied with removable cover when applicable; Tenon and post-top configurations also available
- HANDHOLE: 4" X 6" handhole opening with cover and grounding provision handhole 3" x 5" for 20' pole. The handhole is located 18" from the base of the pole.

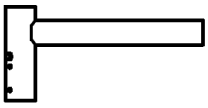
FINISH

- Durable thermoset polyester powder coat paint finish with nominal 3.0 mil thickness
- Decorative finish coat available in six standard colors; Custom colors available, RAL number preferred

MOUNTING		DRILL PATTERN		FINISH		OPTIONS	
1	Single arm mount	B1	Cruzer, "AM" arm	DB	Dark Bronze Textured	GFI[1]	20 Amp GFCI Receptacle and Cover
2	Two fixtures at 180°	B3	2 bolt (2-1/2" spacing Viper "A" arm)	BBT	Basic Black Textured	EHH[1]	Extra Handhole
2L	Two fixtures at 90°	S2	2 bolt (3-1/2" spacing Viper "AD" arm)	BL	Black Textured	C05[1]	.5" Coupling
3T	Three fixtures at 90°			BZT	Bronze Textured	C07[1]	.75" Coupling
3Y	Three fixtures at 120°			WH	White Textured	C20[1]	2" Coupling
4	Four fixtures at 90°			PS	Platinum Silver Smooth	VM2	2nd mode vibration damper
TA	Tenon (2.375" OD)			GT	Graphite Textured	LAB	Less Anchor Bolts
TB	Tenon (2.875" OD)			GYS	Gray Smooth		
TC	Tenon (3.5" OD)			CC	Custom Color		
OT	Open Top (includes pole cap)						

Catalog Number	Height		Nominal Shaft Dimensions	Wall Thickness	Bolt Circle	Bolt Circle Range	Base Plate Size	Base Plate Shape	Anchor bolt size	Bolt Projection	Pole weight
	Feet	Meters									
Group 1											
RTA-B-10-40-A	10	3.0	4" x 3"	.125"	7"	-	7.25	Triangular	3/4x17x3"	3.25"	24
RTA-B-12-40-A	12	3.7	4" x 3"	.125"	7"	-	7.25	Triangular	3/4x17x3"	3.25"	27
RTA-B-14-40-A	14	4.3	4" x 3"	.125"	7"	-	7.25	Triangular	3/4x17x3"	3.25"	32
RTA-B-16-50-A	16	4.9	5" x 3"	.125"	8"	-	8.31	Triangular	3/4x17x3"	3.25"	35
RTA-B-18-50-A	18	5.5	5" x 3"	.125"	8"	-	8.31	Triangular	3/4x17x3"	3.25"	42

SPOKE TYPE BRACKETS



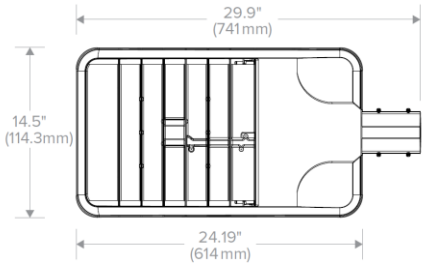
CONFIGURATION	LENGTH	POLE TENON SIZE	COLOR
1	8"	PT20 2" pipe tenon (2.38" O.D.)	DB Dark bronze textured
2-180	12"	PT25 2.5" pipe tenon (2.88" O.D.)	BL Black textured
2-90	18"	PT35 3.5" pipe tenon (4.0" O.D.)	WH White textured
3-120	24"		GR Gray textured
3-90	30"		PS Platinum silver smooth
4-90			GYS Light gray smooth

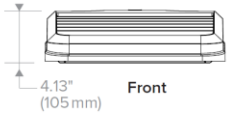
Type S4A & Type S4B: 18-Foot Pole with 6-Inches Exposed of Concrete Foundation Base
Type S4C: 16-Foot Pole with 30-Inches Exposed of Concrete Foundation Base

BEACON design . performance . technology

VIPER S







CONSTRUCTION

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- Coated with a polyester finish that meets ASTM B117 corrosion test requirements and ASTM D522 cracking and loss of adhesion test requirements
- IFS polyester powder-coat electrostatically applied and thermocured. IFS finish consists of a five stage pretreatment regimen with a polymer primer sealer and top coated with a thermoset super TGIC polyester powder coat finish
- The finish meets the AAMA 2604 performance specification which includes passing a 3,000-hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pounds
- External hardware is corrosion resistant

OPTICS

- Cartridge is held together with internal brass standoffs soldered to the board so that it can be field replaced as a one-piece optical system
- One-piece silicone gasket ensures a weatherproof seal around each individual optic
- One-piece optical cartridge system consisting of an LED engine, optics, gasket and stainless steel bezel

Series	
VPL	Viper Large

LED Engine	
64L-135	135W LED array
80L-180	180W LED array
80L-235	235W LED array
96L-220	220W LED array
96L-280	280W LED array
96L-315	315W LED array

CCT/CRI[7]	
3K7	3000K, 70 CRI
4K7	4000K, 70 CRI
5K7	5000K, 70 CRI

Distribution	
FR	Type 1/Front Row
2	Type 2
3	Type 3
4	Type 4
4W	Type 4 Wide
5QM	Type 5QM

Rotation	
Blank	No rotation
L	Optic rotation left[5]
R	Optic rotation right[5]

Voltage	
UNV	120–277V
347	347V
480	480V

Mounting	
A	Rectangular Arm (formerly RA) for square or round pole
MAF	Mast Arm Fitter (formerly SF2) for 2⅜" OD horizontal arm
K	Knuckle (formerly PK2) limit to 30° tilt or 2⅜" OD horizontal arm or vertical tenon

Color	
BL	Black Textured
DB	Dark Bronze Textured
GYS	Light Gray Smooth
PS	Platinum Silver

Control Options	
7PR	7-Pin Receptacle only (shorting cap, photo control, or wireless control provided by others)
7PR-SC	7-Pin Receptacle w/Shorting Cap
7PR-TL	7-Pin Receptacle w/Twist-Lock® photo control

Type S4D: 96L 315

Type S4E: 96L 280

DELIVERED LUMENS

# of LEDs	DRIVE CURRENT (mA)	SYSTEM WATTS	DISTRIBUTION TYPE	5K (5000K nominal, 70 CRI) LUMENS	LPW[1]	B	U	G	4K (4000K nominal, 70 CRI) LUMENS	LPW[1]	B	U	G	3K (3000K nominal, 70 CRI) LUMENS	LPW[1]	B	U	G
96	875 mA	280W	1A	33419	121	3	0	2	34453	125	3	0	2	29974	108	2	0	2
			2	31600	114	3	0	4	32577	118	3	0	4	28342	102	3	0	4
			3	31654	114	3	0	5	32633	118	3	0	5	28390	103	3	0	4
			4	30933	112	2	0	5	31889	115	2	0	5	27744	100	2	0	5
			4W	27708	99	3	0	5	28564	102	3	0	5	24280	87	2	0	5
			5QM	31657	114	5	0	3	32636	118	5	0	3	28393	103	4	0	2
			5QN	33058	119	5	0	1	34080	123	5	0	1	29650	101	5	0	1
96	1000mA	315W[2]	1A	35666	113	3	0	2	36769	117	3	0	2	31989	101	2	0	2
			2	33725	107	3	0	4	34768	110	3	0	4	30248	96	3	0	4
			3	33782	107	3	0	5	34827	110	3	0	5	30299	96	3	0	4
			4	33012	105	2	0	5	34033	108	2	0	5	29609	94	2	0	5
			4W	29571	94	3	0	5	30485	97	3	0	5	25913	82	2	0	5
			5QM	33785	107	5	0	3	34830	110	5	0	3	30302	96	5	0	2



ROUND TAPERED ALUMINUM POLE

UPSWEEP STYLE

Catalog Number	Mounting Height		Arm Length		Shaft Size [4]	Luminaire Characteristics			Bolt Circle[5] (inches)
	ft	m	ft	m		Wt. (lbs)	Wt (kg)	EPA [3]	
UPSWEEP STYLE, SINGLE ARM									
RTA01	20	6.10	4	1.22	6 x 4.5 x 18'	75	34.0	1.6	9-10
RTA02	20	6.10	6	1.83	6 x 4.5 x 18'	71	32.2	1.6	9-10
RTA03	25	7.62	4	1.22	7 x 4.5 x 23'	75	34.0	1.6	10-11
RTA04	25	7.62	6	1.83	7 x 4.5 x 23'	71	32.2	1.6	10-11
RTA05	25	7.62	8	2.44	7 x 4.5 x 23'	52	23.6	1.6	10-11

Note: All brackets have 2" NPS slipfitters unless otherwise specified. Wall Thickness:.188 inch in every shaft, except where otherwise stated. Hand hole included in above catalog numbers. Center of hand hole 18" from ground. **All Anchor bolt sizes 1" x 36" x 4"**. All poles have natural aluminum satin finish.

1 Wall thickness: .219 inch

2 Wall thickness: .250 inch

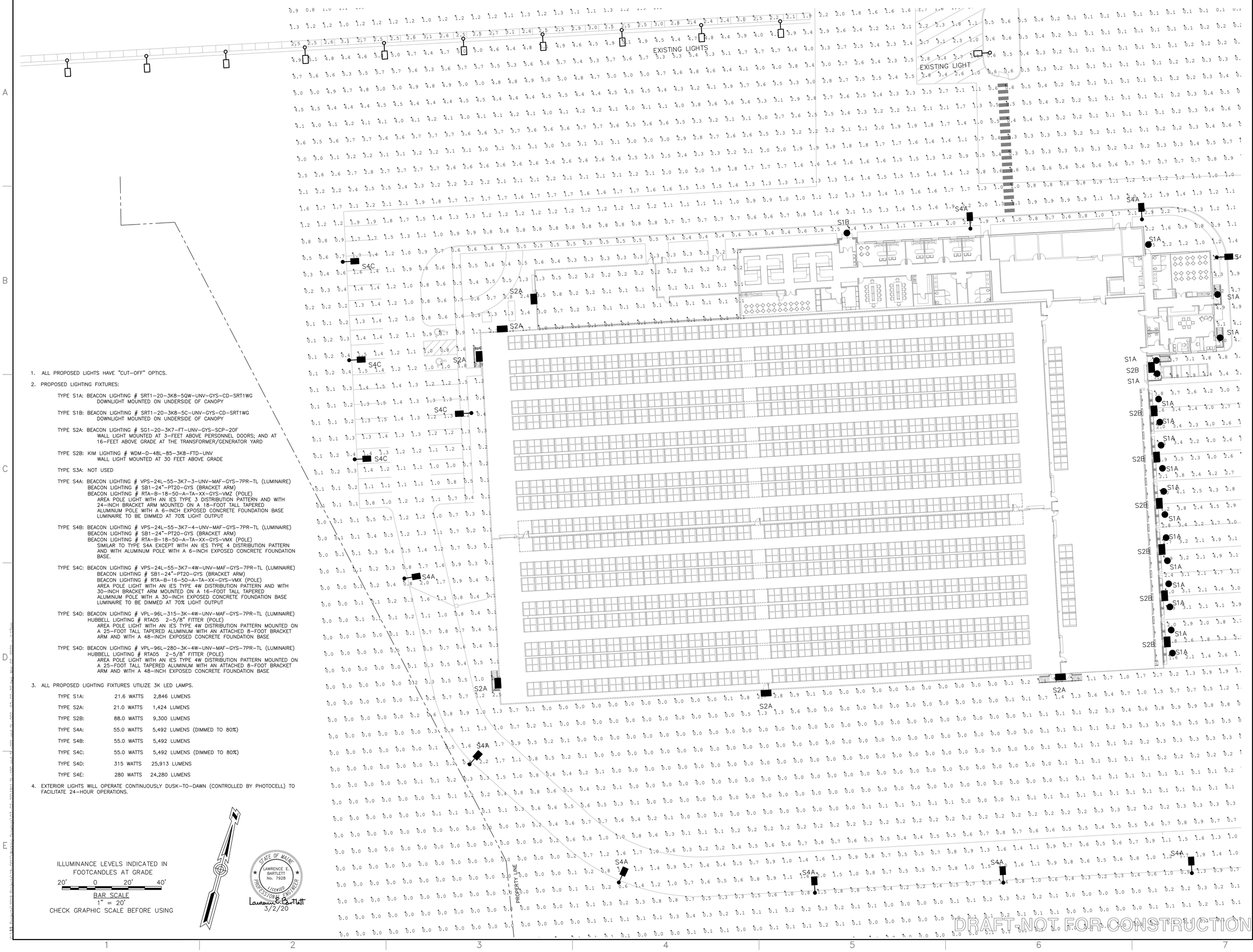
3 Luminaire's effective projected area based on 80 m.p.h. wind velocity; For 90 and 100 m.p.h. wind velocity, consult factory; EPA is total sq. ft. for all luminaires

4 In. x In. x Ft. (bottom OD x Top OD x length)

5 Center-to-center diameter of bolt circle; Slotted for 1" adjustment

Type S4D & Type S4E: 25-Foot Pole with 48-Inches Exposed of Concrete Foundation Base

HUBBELL® Outdoor Lighting



1. ALL PROPOSED LIGHTS HAVE "CUT-OFF" OPTICS.

2. PROPOSED LIGHTING FIXTURES:

   TYPE S1A: BEACON LIGHTING # SRT1-20-3K8-5QW-UNV-GYS-CD-SRT1WG
   DOWNLIGHT MOUNTED ON UNDERSIDE OF CANOPY

   TYPE S1B: BEACON LIGHTING # SRT1-20-3K8-5C-UNV-GYS-CD-SRT1WG
   DOWNLIGHT MOUNTED ON UNDERSIDE OF CANOPY

   TYPE S2A: BEACON LIGHTING # SG1-20-3K7-FT-UNV-GYS-SCP-20F
   WALL LIGHT MOUNTED AT 3-FEET ABOVE PERSONNEL DOORS; AND AT 16-FEET ABOVE GRADE AT THE TRANSFORMER/GENERATOR YARD

   TYPE S2B: KIM LIGHTING # WDM-D-48L-85-3K8-FTD-UNV
   WALL LIGHT MOUNTED AT 30 FEET ABOVE GRADE

   TYPE S3A: NOT USED

   TYPE S4A: BEACON LIGHTING # VPS-24L-55-3K7-3-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
   BEACON LIGHTING # SB1-24"-PT20-GYS (BRACKET ARM)
   BEACON LIGHTING # RTA-B-18-50-A-TA-XX-GYS-VMZ (POLE)
   AREA POLE LIGHT WITH AN IES TYPE 3 DISTRIBUTION PATTERN AND WITH 24-INCH BRACKET ARM MOUNTED ON A 18-FOOT TALL TAPERED ALUMINUM POLE WITH A 6-INCH EXPOSED CONCRETE FOUNDATION BASE LUMINAIRE TO BE DIMMED AT 70% LIGHT OUTPUT

   TYPE S4B: BEACON LIGHTING # VPS-24L-55-3K7-4-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
   BEACON LIGHTING # SB1-24"-PT20-GYS (BRACKET ARM)
   BEACON LIGHTING # RTA-B-18-50-A-TA-XX-GYS-VMX (POLE)
   SIMILAR TO TYPE S4A EXCEPT WITH AN IES TYPE 4 DISTRIBUTION PATTERN AND WITH ALUMINUM POLE WITH A 6-INCH EXPOSED CONCRETE FOUNDATION BASE.

   TYPE S4C: BEACON LIGHTING # VPS-24L-55-3K7-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
   BEACON LIGHTING # SB1-24"-PT20-GYS (BRACKET ARM)
   BEACON LIGHTING # RTA-B-16-50-A-TA-XX-GYS-VMX (POLE)
   AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN AND WITH 30-INCH BRACKET ARM MOUNTED ON A 16-FOOT TALL TAPERED ALUMINUM POLE WITH A 30-INCH EXPOSED CONCRETE FOUNDATION BASE LUMINAIRE TO BE DIMMED AT 70% LIGHT OUTPUT

   TYPE S4D: BEACON LIGHTING # VPL-96L-315-3K-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
   HUBBELL LIGHTING # RTA05 2-5/8" FITTER (POLE)
   AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN MOUNTED ON A 25-FOOT TALL TAPERED ALUMINUM WITH AN ATTACHED 8-FOOT BRACKET ARM AND WITH A 48-INCH EXPOSED CONCRETE FOUNDATION BASE

   TYPE S4D: BEACON LIGHTING # VPL-96L-280-3K-4W-UNV-MAF-GYS-7PR-TL (LUMINAIRE)
   HUBBELL LIGHTING # RTA05 2-5/8" FITTER (POLE)
   AREA POLE LIGHT WITH AN IES TYPE 4W DISTRIBUTION PATTERN MOUNTED ON A 25-FOOT TALL TAPERED ALUMINUM WITH AN ATTACHED 8-FOOT BRACKET ARM AND WITH A 48-INCH EXPOSED CONCRETE FOUNDATION BASE

3. ALL PROPOSED LIGHTING FIXTURES UTILIZE 3K LED LAMPS.

TYPE S1A:	21.6 WATTS	2,846 LUMENS
TYPE S2A:	21.0 WATTS	1,424 LUMENS
TYPE S2B:	88.0 WATTS	9,300 LUMENS
TYPE S4A:	55.0 WATTS	5,492 LUMENS (DIMMED TO 80%)
TYPE S4B:	55.0 WATTS	5,492 LUMENS
TYPE S4C:	55.0 WATTS	5,492 LUMENS (DIMMED TO 80%)
TYPE S4D:	315 WATTS	25,913 LUMENS
TYPE S4E:	280 WATTS	24,280 LUMENS

4. EXTERIOR LIGHTS WILL OPERATE CONTINUOUSLY DUSK-TO-DAWN (CONTROLLED BY PHOTOCELL) TO FACILITATE 24-HOUR OPERATIONS.

ILLUMINANCE LEVELS INDICATED IN FOOTCANDLES AT GRADE

20' 0 20' 40'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

STATE OF MAINE
LAWRENCE E. BARTLETT
No. 7928
REGISTERED PROFESSIONAL ENGINEER
LICENSED

Lawrence E. Bartlett
3/2/20

WOODARD & CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

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REV	DESCRIPTION	DATE
1	UPDATED PER CLIENT COMMENTS	3/2/20

CHECKED BY: JJ
DRAWN BY: LEB
DESIGNED BY: LEB

SITE LIGHTING ILLUMINANCE CALCULATION PLAN - PART 1

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: FEBRUARY 2020
SCALE: 1"=20'-0"
SHEET: # OF XX

SL-001

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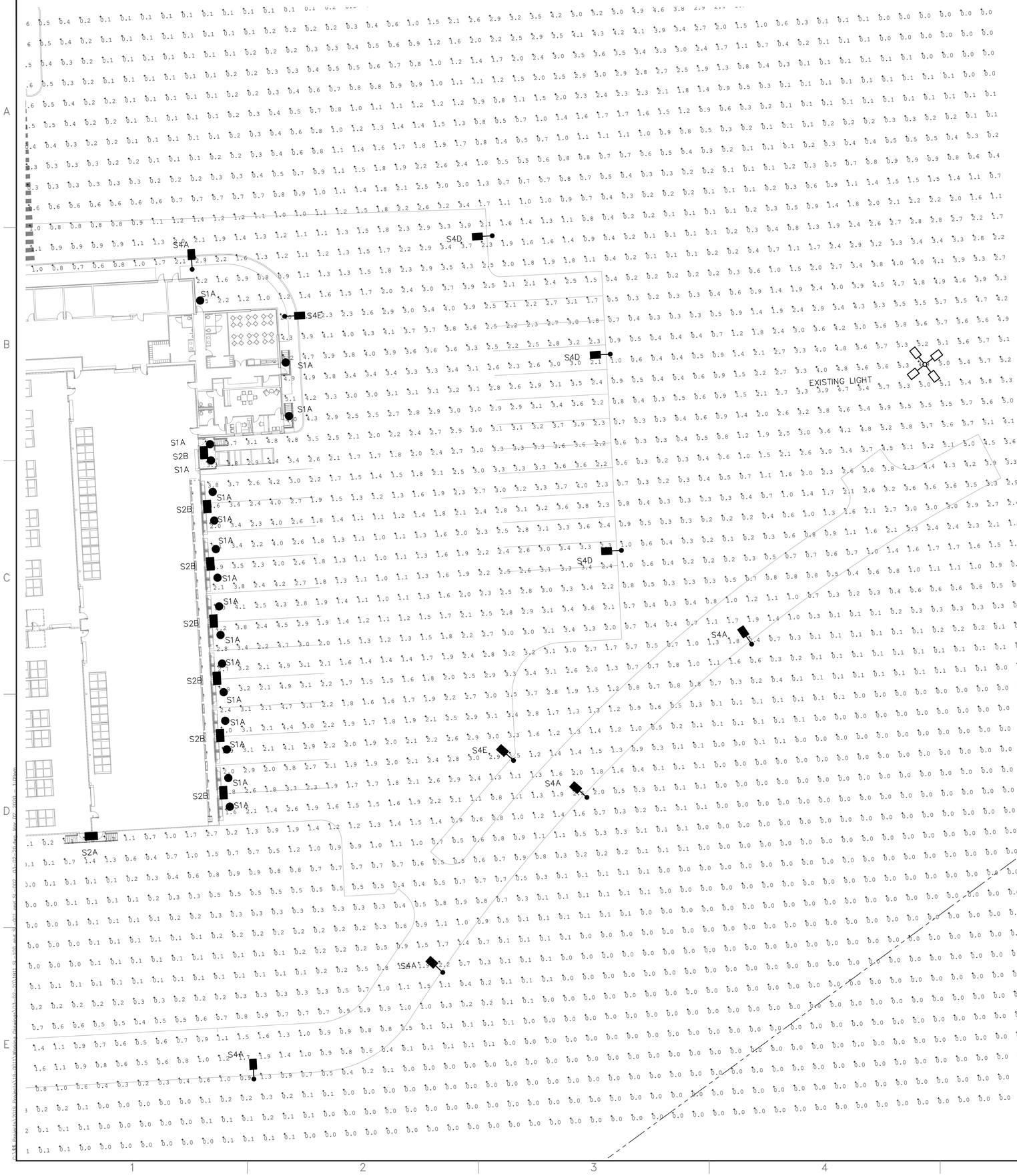

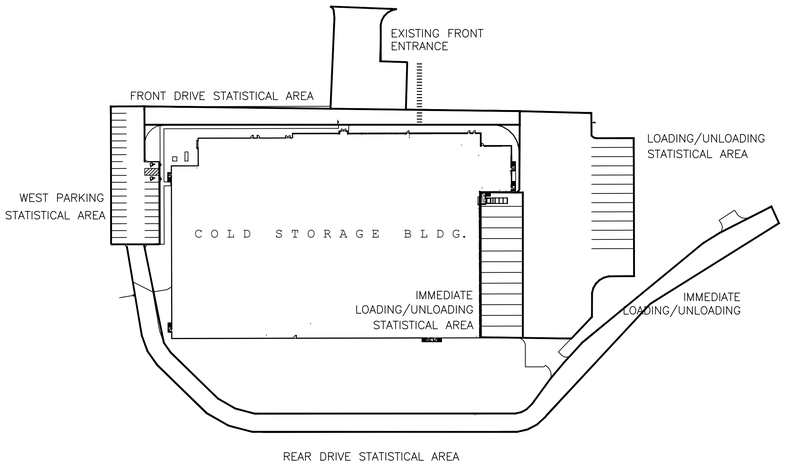

KEY PLAN

CALCULATED ILLUMINANCE RESULTS (FOOTCANDLES AT GRADE):

	AVE.	MAX.	MIN.	AVE–TO–MIN UNIFORMITY	MAX–TO–MIN UNIFORMITY
EXISTING FRONT ENTRANCE:	1.8 FC	3.3 FC	0.5 FC	3.7–TO–1	6.6–TO–1
FRONT DRIVE:	1.2 FC	2.2 FC	0.6 FC	1.9–TO–1	3.7–TO–1
WEST PARKING LOT:	1.2 FC	1.9 FC	0.7 FC	1.8–TO–1	2.7–TO–1
REAR DRIVE:	1.2 FC	5.0 FC	0.3 FC	4.1–TO–1	16.7–TO–1
GENERAL LOADING/UNLOADING AREA:	2.6 FC	4.9 FC	1.0 FC	2.6–TO–1	4.9–TO–1
IMMEDIATE LOADING DOCK AREA:	3.0 FC	4.9 FC	1.4 FC	2.2–TO–1	3.5–TO–1

STATE OF MAINE
LAWRENCE E. BARTLETT
No. 7928
LICENSED PROFESSIONAL ENGINEER
Lawrence E. Bartlett
3/2/20

ILLUMINANCE LEVELS INDICATED IN FOOTCANDLES AT GRADE

20' 0 20' 40'

BAR SCALE
1" = 20'

CHECK GRAPHIC SCALE BEFORE USING

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CHECKED BY: ##
DATE: 3-30-20 08:30 am

SITE LIGHTING ILLUMINANCE CALCULATION PLAN - PART 2

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: FEBRUARY 2020
SCALE: 1"=20'-0"
SHEET: # OF XX

SL-002

EXISTING LIGHTS TO REMAIN

EXISTING LIGHT TO REMAIN

EXISTING LIGHT TO REMAIN

EXISTING LIGHT TO REMAIN

S1B S4A S4A S4D

S4C S2A S1A S4E

S2A S1A S4D

S4C S2A S1A

S2B S1A

S4C S1A

S2B S1A

S4C S1A

S2B S1A

S1A S1A

S2B S1A

S1A S1A

S2B S1A

S1A S1A

S2B S1A

S1A S1A

S2B S1A

S1A

S4D

S4A

EXISTING LIGHT
(NOTE 1)

S4E

S4A

S4A

S2A S2A S2A

S4A

EXISTING LIGHT
(NOTE 2)

S4A

S4A S4A S4A

PROPERTY LINE

S4A

EXISTING LIGHT
(NOTE 1)

1. WHERE INDICTED, DISCONNECT AND REMOVE THE EXISTING LIGHTING POLE. THE EXISTING CONCRETE FOUNDATION BASE SHALL REMAIN. PROVIDE A WEATHERPROOF BOX AT THE BASE TO FACILITATE THE CONNECTION OF THE EXISTING CIRCUIT CONDUCTORS TO MAINTAINE THE CIRCUIT CONTINUITY. RETURN THE LIGHTING POLE AND LUMINAIRES IN WORKING CONDITION TO THE OWNER.
2. WHERE INDICTED, DISCONNECT AND REMOVE THE EXISTING LIGHTING POLE. CUT THE EXISTING CONCRETE FOUNDATION BASE BELOW THE EXISTING GRADE. PROVIDE A WEATHERPROOF, TRAFFIC-RATED BOX AT THE LOWERED BASE TO FACILITATE THE CONNECTION OF THE EXISTING CIRCUIT CONDUCTORS TO MAINTAINE THE CIRCUIT CONTINUITY. INSTALL THE BOX COVER FLUSH WITH GRADE. RETURN THE LIGHTING POLE AND LUMINAIRES IN WORKING CONDITION TO THE OWNER.

STATE OF MAINE
LAWRENCE E. BARTLETT
No. 7928
LICENSED
PROFESSIONAL ENGINEER
Lawrence E. Bartlett
3/2/20

ILLUMINANCE LEVELS INDICATED IN FOOTCANDLES AT GRADE

30' 0 30' 60'

BAR SCALE
1" = 30'

CHECK GRAPHIC SCALE BEFORE USING

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REV	DESCRIPTION	DATE
	LBR-S-100 MD-S-401.dwg	

DESIGNED BY: LEB
DRAWN BY:
CHECKED BY:

SITE LIGHTING PLAN

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO.:	0232277.00
DATE:	FEBRUARY 2020
SCALE:	1"=20'-0"
SHEET:	#OF XX

SL-100

BEACH STREET

WEST COMMERCIAL STREET

WB-67 – Interstate Semi-Trailer

WB-67 – Interstate Semi-Trailer

LW

E

P

40’ 0 40’ 80’

BAR SCALE
1” = 40’
CHECK GRAPHIC SCALE BEFORE USING

41 Hutchins Drive
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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VEHICLE TURNING – 1

DESIGNED BY: AL
DRAWN BY: BCM
CHECKED BY: DBS
0232277.00 VEHICLE FIGU*.dwg

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO: 0232277
DATE: MAY 2020
SCALE: 1”=40’

VT - 1

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BEACH STREET

WEST COMMERCIAL STREET

WB-67 – Interstate Semi-Trailer

LW

E

P

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VEHICLE TURNING – 2

DESIGNED BY: AL
DRAWN BY: BCM
CHECKED BY: DBS
0232277.00 VEHICLE FIGU*.dwg

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO: 0232277
DATE: MAY 2020
SCALE: 1"=40'

VT - 2

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BEACH STREET

WEST COMMERCIAL STREET

LW

E

P

MT-67 - Interstate Semi-Trailer

1

9

10

8

7

6

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VEHICLE TURNING – 3

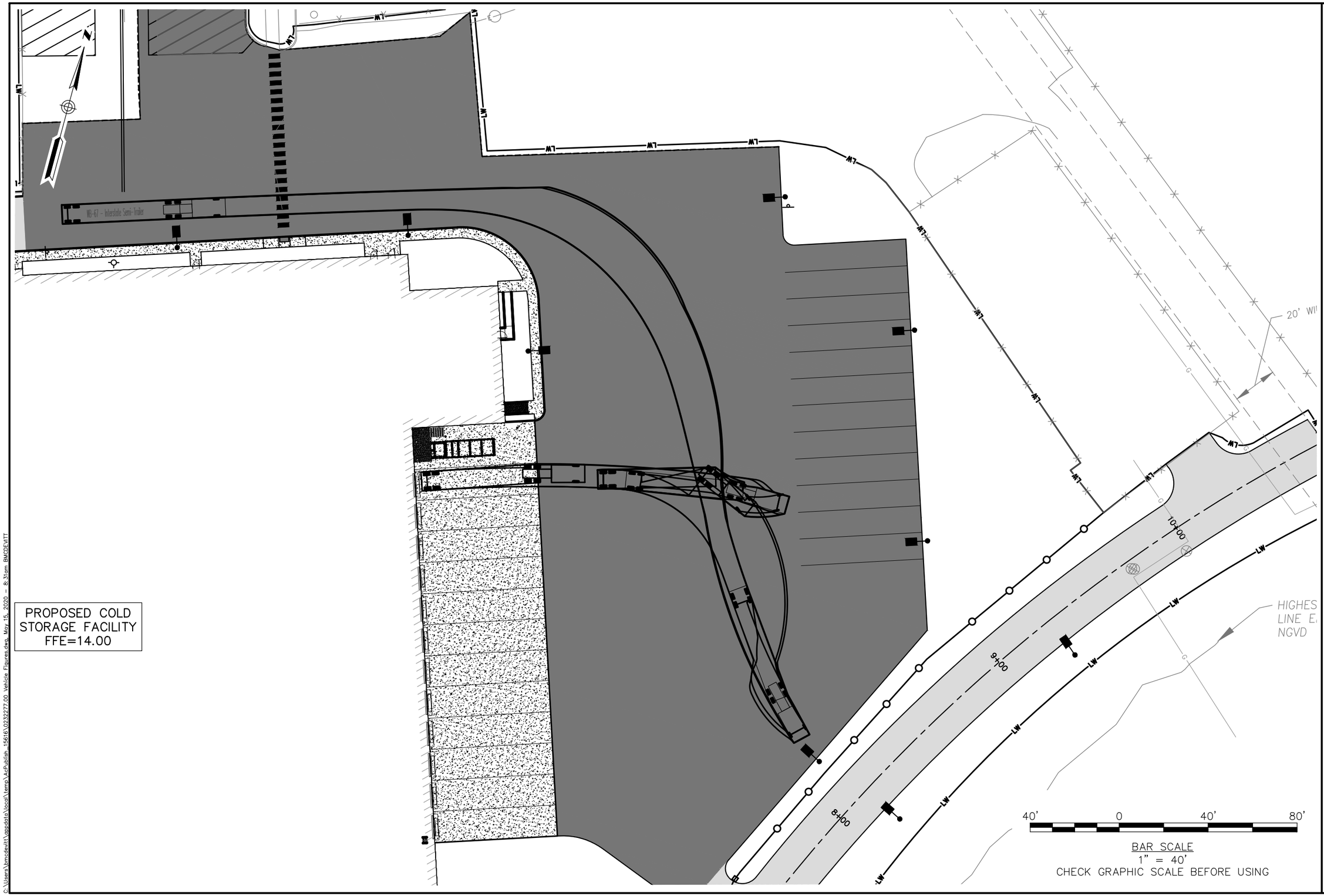
DESIGNED BY: AL
DRAWN BY: BCM
CHECKED BY: DBS
0232277.00 VEHICLE FIGU*.dwg

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO: 0232277
DATE: MAY 2020
SCALE: 1"=40'

VT - 3



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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VEHICLE TURNING – 4

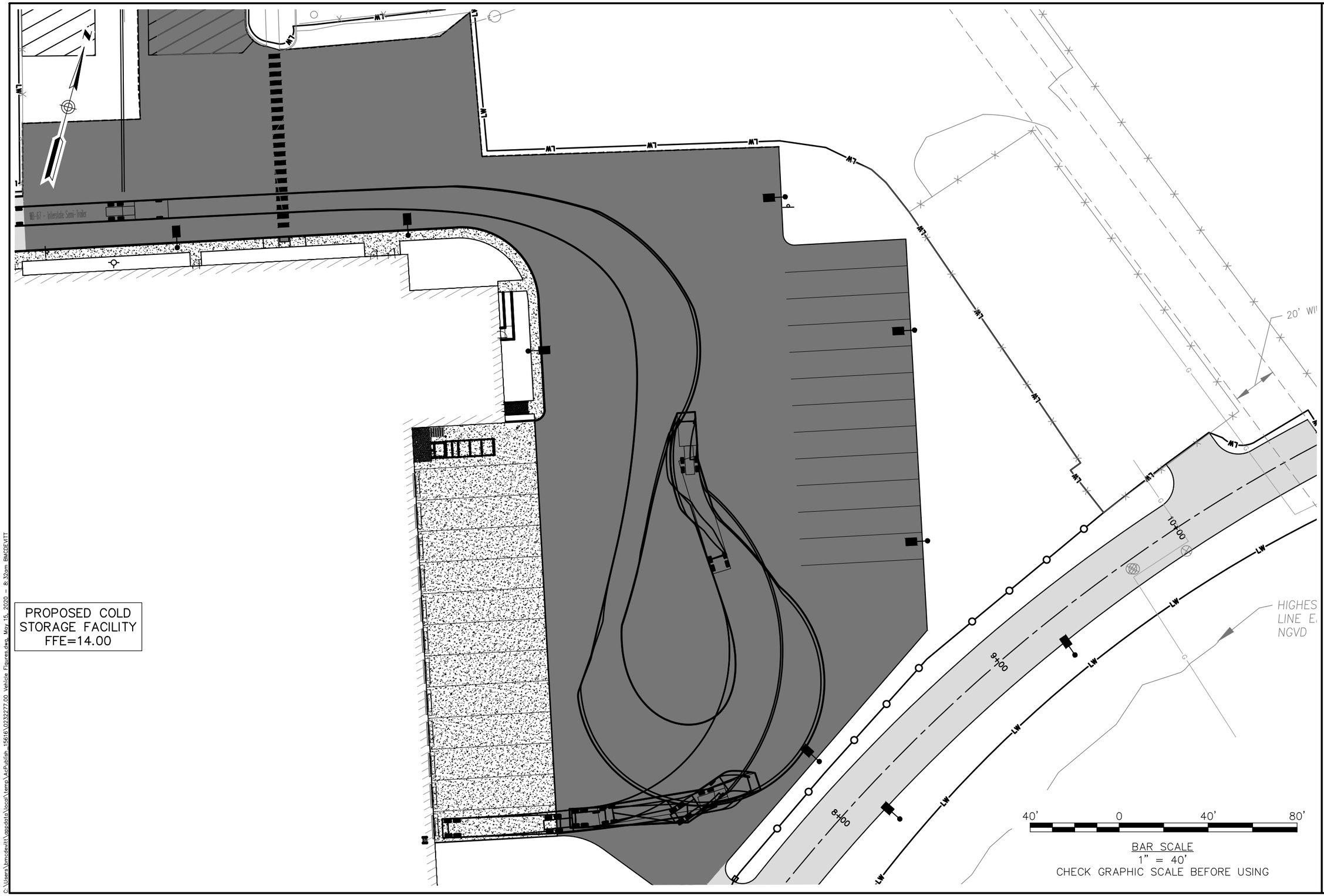
DESIGNED BY: AL
DRAWN BY: BCM
CHECKED BY: DBS
0232277.00 VEHICLE FIGU*.dwg

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO: 0232277
DATE: MAY 2020
SCALE: 1"=40'

VT - 4



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COMMITMENT & INTEGRITY DRIVE RESULTS
WOODARD & CURRAN

VEHICLE TURNING – 5

DESIGNED BY: AL
DRAWN BY: BCM
CHECKED BY: DBS
0232277.00 VEHICLE FIGU*.dwg

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO: 0232277
DATE: MAY 2020
SCALE: 1"=40'

VT - 5

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WEST COMMERCIAL STREET

PROPOSED COLD STORAGE FACILITY FFE=14.00

Pumper Fire Truck	
Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00

60' 0 60' 120'

BAR SCALE
1" = 60'
CHECK GRAPHIC SCALE BEFORE USING

41 Hutchins Drive
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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VEHICLE TURNING – 6

DESIGNED BY: AL
DRAWN BY: BCM
CHECKED BY: DBS
0232277.00 VEHICLE FIGU*.dwg

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

JOB NO: 0232277
DATE: MAY 2020
SCALE: 1"=40'

VT - 6

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10. CONSISTENCY WITH CITY COMPREHENSIVE PLAN

The proposed project is in alignment with the design guidelines specified in the City of Portland Comprehensive Plan, *Portland's Plan 2030*, developed in 2017. The proposed project will support local businesses and benefit marine economy by providing a refrigeration facility along the City's working waterfront. The proposed project satisfies two of the future strategies listed in the Waterfront Policy Guide. Excerpts from the Waterfront Policy Guide are provided below:

> *"Support private, federal, and State investment in the Western Waterfront" (Future Strategy 2).*
>
> *"Promote development of cold storage warehousing to support a competitive Port of Portland by improving capacity to serve the cargo needs of the seafood, agriculture, food manufacturing, and beverage industries of northern New England" (Future Strategy 10).*

The proposed development will benefit the City's working waterfront and local economy, and is consistent with the City's Comprehensive Plan.

REPORT

16-1314 S

April 20, 2020

Explorations and Geotechnical Engineering Services

Proposed Cold Storage Facility
Maine Port Authority
West Commercial Street
Portland, Maine

Prepared For:
Woodard & Curran
Attention: Jedd Steinglass, LSP
41 Hutchins Drive
Portland, Maine 04102

Prepared By:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039
T: 207-657-2866

S.W.COLE ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing and Special Inspections*
- *GeoEnvironmental Services*
- *Test Boring Explorations*

www.swcole.com

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Appendix A Limitations
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Appendix C Exploration Logs & Key
Appendix D Cone Penetrometer Test Data Report
Appendix E Geophysical Testing Report
Appendix F Laboratory Test Results

16-1314 S

April 20, 2020

Woodard & Curran
Attention: Jedd Steinglass, LSP
41 Hutchins Drive
Portland, Maine 04102

Subject: Explorations and Geotechnical Engineering Services
Proposed Cold Storage Facility
Maine Port Authority
West Commercial Street
Portland, Maine

Dear Jedd:

In accordance with our Contract Addendum, dated April 22, 2020, we have reviewed prior geotechnical subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to review prior geotechnical subsurface information at the site in order to develop geotechnical recommendations relative to foundations, earthwork and pavement associated with the proposed construction. Our scope of services included a review of prior explorations, a geotechnical analysis of the subsurface findings and preparation of this report.

1.2 Site and Proposed Construction

The site is the former Portland Gas Works located between West Commercial Street and the Fore River, west of the Casco Bay Bridge in Portland, Maine. We understand development plans call for construction of a new 120,000 SF cold storage facility with associated paved areas. We understand the building will be a dock-high, steel-framed

warehouse type structure with on-grade floor slabs and a sub-slab insulation and heating coil system to control freezing temperatures from penetrating the ground below the slab. We understand column loads may approach 175 kips with wall loads approaching 5 kips/foot. We understand floor slab loads approaching 700 psf are anticipated.

We understand a finished floor elevation (FFE) of 14.0 feet (project datum) is proposed. Based on proposed and existing grades, we understand a tapered raise in grade approaching 4 feet is required for the building and tapered lowering of grade approaching 1 foot is needed in proposed paved areas.

Proposed and existing site features are shown on the "Exploration Location Plan" attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Geotechnical explorations were generally completed in two phases; a 2017 preliminary phase, and a 2018 design phase, as summarized below:

2.1.1 Preliminary Phase Explorations

Six test borings (B-1001 through B-1005, including B-1001A) were made at the site in December 2017 by S. W. Cole Explorations, LLC as part of a preliminary phase study. These exploration locations were selected and established in the field by S.W.COLE. The approximate locations of these explorations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of these explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on these logs were estimated based on topographic information shown on the "Exploration Location Plan".

2.1.2 Design Phase Explorations

Two test borings (B-2001 and B-2003) were made at the site from September 19 to September 21, 2018 by S. W. Cole Explorations, LLC. Theses exploration locations were selected and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE). The approximate locations of these explorations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of these explorations and a key to the notes and symbols used on these logs are attached in Appendix C. The elevations shown on

these logs were estimated based on topographic information shown on the “Exploration Location Plan”.

Twenty five Cone Penetrometer Tests (CPT18-2, CPT18-4 through CPT18-12 and CPT18-14) were made at the site from September 19 to September 21, 2018 by ConeTec, Inc. working under subcontract to S.W.COLE. The CPT exploration locations were selected and established in the field by S.W.COLE. The approximate CPT exploration locations are shown on the “Exploration Location Plan” attached in Appendix B. ConeTec’s CPT Data Report is attached in Appendix D.

2.2 Testing

2.2.1 Field Testing

The test borings were drilled using cased wash-boring techniques. The soils were sampled at 2 to 10 foot intervals using a split spoon sampler and Standard Penetration Testing (SPT) methods. Shelby tube sampling and Vane Shear Testing (VST) was performed in certain explorations where softer cohesive soils were encountered. SPT blow counts and VST results are shown on the logs.

2.2.2 Geophysical Testing

Hager-Richter Geoscience, Inc. (Hager-Richter) of Salem, New Hampshire, working under subcontract to S.W.COLE, performed geophysical testing at the site in December 2017 as part of a preliminary phase study. The purpose of the geophysical testing was to assess shear wave velocities of the subsurface profile beneath the site for use in determining seismic soil Site Class per IBC. Hager-Richter’s report is attached in Appendix E.

2.2.3 Laboratory Testing

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. Atterberg Limits, moisture and organic content test results are noted on the logs. The results of one-dimensional laboratory consolidation tests are attached in Appendix F.

DRAFT

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

The explorations were made in the area of the proposed building and encountered a soils profile generally consisting of 9 to 22 feet of uncontrolled granular fills with relic foundations and debris, overlying 0 to 17 feet of sandy silt with shells (bay mud), overlying 0 to 36 feet of glaciomarine clay, overlying medium dense marine sands at depths ranging from about 45 to 80 feet below the ground surface (bgs), overlying dense to very dense glacial till at depths ranging from about 75 to 140 feet bgs. Bedrock was not encountered within the depths explored.

The uncontrolled fills across the site contained coal tar and petroleum contamination extending down to the native Bay Mud stratum. At numerous exploration locations, below grade debris and relic foundations were encountered that resulted in terminating the exploration and making one or more additional attempts in the same or offset location.

Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

3.2 Groundwater

The soils encountered at the test borings were wet to saturated from 5 to 10 feet bgs. Groundwater is likely tidally influenced from the level of the Fore River. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to tides, periods of snowmelt and precipitation, as well as changes in site use.

DRAFT

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle geotechnical considerations include:

- Conventional spread footing foundations and on-grade floor slabs do not appear feasible without significant ground improvement to mitigate post-construction settlement.

- The presence of below grade debris, relic foundations and contamination create challenges for ground improvement; consequently, we recommend the proposed building and floor slab be supported on steel H-piles driven into bearing strata of marine sands overlying dense to very dense glacial till.

- Settlement of the uncontrolled fills and glaciomarine clay will impose downdrag loading on piles. Below grade debris and relic foundations will cause pile locations to drift during pile installation. As necessary to overcome below grade obstructions, we recommend that pile locations be pre-drilled to a depth of about 25 feet and backfilled with bentonite clay.

- We understand the site soils and groundwater will be characterized by the project environmental consultant for environmental handling and disposal. .

- We understand a sub-slab venting system is planned; we understand the structural slab, sub-slab venting, insulation and heating systems will be designed by others.

4.2 Settlement Evaluation

The glaciomarine clay beneath the site is compressible under loading from the proposed site fills and building loads. We have estimated post-construction settlement due to consolidation of the glaciomarine clay considering:

- The findings at the test borings;
- The results of the one-dimensional consolidation testing;

DRAFT

- The existing and proposed site grading; and,
- The proposed structural loading

We estimate that post-construction settlement may approach 19-inches total with over 12 inches of differential settlement across the building pad. These settlement magnitudes greatly exceed tolerable limits for building construction; consequently, the foundation and floor slab will require piles or ground improvement that transfer loads through the compressive layer and into the stable bearing strata of marine sands and glacial till underlying the site.

4.3 Site and Subgrade Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. Surficial organics, roots and topsoil should be completely removed from areas of proposed fill and construction. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

Building Pad and Foundations: We recommend pile caps and grade beams be underlain with at least 3 inches of Crushed Stone to provide a working mat and casting bed for foundation construction. Prior to installing the Crushed Stone venting layer below the structural floor system; as discussed herein, we recommend densifying soils with a vibratory roller compactor weighing at least 10 tons. Areas that become soft or continue to yield after densification should be removed and replaced with compacted Granular Borrow.

Paved Areas and Site Utilities: Uncontrolled fills encountered beneath proposed paved areas should be densified with a smooth-drum roller compactor weighing at least 10 tons. Areas that become soft or continue to yield after densification should be removed and replaced with compacted Granular Borrow. A woven geotextile fabric should be placed over pavement subgrades prior to installing Subbase Aggregate. We anticipate pipes and utility structures will be founded within existing uncontrolled fills that contain rubble and debris. We recommend the depth of customary bedding materials be at least 6 inches beneath pipes and 18 inches beneath structures.

4.4 Excavation and Dewatering

Excavation work will generally encounter uncontrolled fills with rubble debris and potentially coal tar and petroleum; sitework and utility subcontractors should be appropriately qualified for the expected environmental conditions as directed by the project environmental consultant. Earthwork and grading activities should ideally occur during drier, non-freezing weather of Spring, Summer and Fall.

Sumping and pumping dewatering techniques should be adequate to control groundwater in excavations above the groundwater table. Excavations below the groundwater table will require sheetpiling for soil support and groundwater cutoff. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction.

Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. Design and planning of excavations, excavation support, and dewatering is the contractor's responsibility.

4.5 Foundations

Considering the subsurface findings and proposed construction, we recommend the proposed building and floor slabs be supported on steel H-piles fitted with cast driving tips, driven into bearing strata of marine sands overlying dense glacial till or refusal on bedrock. We offer the following H-pile sizes and allowable axial compressive capacities for design consideration:

RECOMMENDED H-PILE CAPACITIES		
50 ksi Steel H-pile Section	Allowable Geotechnical Compressive Pile Capacity (kips)	
	FS = 2.25	FS = 1.9
HP 12 x 74	150 kips	190 kips
HP 14 x 89	230 kips	280 kips
HP 14 x 102	280 kips	340 kips
HP 14 x 117	330 kips	400 kips
Notes: 1) Allowable Geotechnical Capacity reduced for downdrag and corrosion 2) FS of 2.25 requires PDA load testing; FS of 1.9 requires Static Load Test 3) HP 12 x 74 limited to Administration/Maintenance Wing		

Based on the subsurface findings, we anticipate pile lengths may range from 90 to 150 feet across the building pad. We recommend pile caps for columns be supported by at least two piles if laterally tied together by tie beams or a reinforced structural concrete slab and three piles if laterally isolated. Piles should be spaced a minimum center-to-center distance of at least 3 pile diameters, but no less than 30 inches.

Pile caps and grade beams exposed to freezing temperatures should be covered with at least 4.5 feet of soil for frost protection. Based on shear wave velocity testing by Hager-Richter, we recommend design consider a seismic soil Site Class D (IBC 2015).

To help reduce downdrag loading on piles and drift of pile location from debris, we recommend pre-drilling pile locations through the uncontrolled fill and relic foundations zone and backfilling with bentonite clay. The bentonite clay will also help to seal pile penetrations through glaciomarine clays.

Pile Submittal & Load Test: We recommend the contractor coordinate a test pile program including monitoring of several piles with a Pile Driving Analyzer (PDA) to determine pile and driving equipment compatibility as well as to define the "set" criteria and pile capacity. The test pile program should include PDA monitoring of the test piles during re-strikes in order to assess pile capacity. The pile driving contractor should submit a WEAP analysis and information relative to pile driving equipment prior to beginning driving. In order to use the higher pile capacities associated with a factor of safety of 1.9, the contractor will be required to perform a static load test to verify pile capacity.

S.W.COLE should be engaged to review the pile submittal and to observe pile driving, as well as pile load testing activities.

4.6 Floor Slabs

We recommend a pile supported structural floor slab system for the building and entrance slabs. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function. Sub-slab utilities should be suspended from the structural slab such that post-construction settlement of sub-slab fill will not affect the utilities.

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Considering the coal tar and petroleum contaminants encountered beneath the proposed building, we recommend the floor slab system include a vapor retarder to mitigate moisture vapors and an HDPE liner overlying at least 8-inches of compacted Crushed Stone to provide a venting layer to collect soil gas and petroleum vapors from the coal tar and petroleum contaminants. Perforated pipes should be installed within the Crushed Stone venting layer to collect and discharge potential soil gas and petroleum vapors from beneath the building. General details of the structural floor slab system are illustrated on the "Foundation Detail Sketch" attached in Appendix B. The HDPE liner and subslab venting system should be design by a qualified Indoor Air Quality (IAQ) professional.

The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand direct contact with sub-slab materials and construction activity. The vapor retarder material should be placed according to the manufacturer's recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

We understand the structural slab, sub-slab insulation, heating and insulation system will be designed by others.

4.7 Entrance Slabs and Sidewalks

Entrance slabs should be pile-supported. Sidewalks adjacent to the building must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that non-frost susceptible Structural Fill be provided to a depth of at least 4.5 feet below the top of entrance sidewalks. This thickness of Structural Fill should extend the full width of the entrance sidewalk and outward at least 4.5 feet, thereafter transitioning up to the bottom of the adjacent

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sidewalk or pavement gravels at a 3H:1V or flatter slope. General details of this frost transition zone are shown on the "Foundation Detail Sketch" attached in Appendix B.

4.8 Fill, Backfill and Compaction

We recommend the following fill and backfill materials: recycled products must also be tested in accordance with applicable environmental regulations and approved by a qualified environmental consultant.

Common Borrow: Fill to raise grades in pile-supported building and structural slab areas should be non-organic compactable earth meeting the requirements of 2014 MaineDOT Standard Specification 703.18 Common Borrow.

Granular Borrow: Fill to raise grades in paved areas, as well as to repair soft areas, should be sand or silty sand meeting the requirements of 2014 MaineDOT Standard Specification 703.19 Granular Borrow.

Structural Fill: Backfill for foundations, material below exterior entrance slabs and truck dock slabs, as well as through the frost transition zone below entrance sidewalks, should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 6

Underdrain Sand: Sand used for underdrains should be clean, free-draining sand meeting the requirements of 2014 MaineDOT Standard Specification 703.22 Underdrain Backfill Material Type B.

Crushed Stone: Crushed Stone, used beneath foundations should be washed ¾-inch crushed stone meeting the requirements of 2014 MaineDOT Standard Specification 703.22 Underdrain Backfill Material Type C.

Reuse of Site Soils: The existing site fills may be reused as Common Borrow to raise grades in pile-supported building areas, provided they are at a compactable moisture content at the time of reuse and free of deleterious materials.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

4.9 Paved Areas

We anticipate paved areas will be subjected primarily to heavy truck traffic. Considering the site soils, and proposed usage, we offer the following pavement section for consideration. Materials are referenced to 2014 Maine DOT Standard Specifications.

FLEXIBLE (HMA) PAVEMENT SECTION		
Layer	**Thickness**	
	Standard Duty (Cars)	**Heavy Duty (Trucks)**
MaineDOT 9.5 mm Hot Mix Asphalt	1.25”	1.25”
MaineDOT 12.5 mm Hot Mix Asphalt	2.75”	1.75”
MaineDOT 19.0 mm Hot Mix Asphalt	--	3”
MaineDOT 703.06 Aggregate Base Type A	3”	6”
MaineDOT 703.06 Aggregate Subbase Type D	12”	18”
Woven Geotextile Subgrade Fabric	Mirafi 600X	Mirafi HP270

RIGID (CONCRETE) PAVEMENT SECTION FOR TRUCK YARD	
Layer	**Thickness**
Concrete – 4,500 psi compressive, 500 psi flexural, 1½ inch aggregate, 6 ±1% air entrainment with doweled and caulked joints	8”
MaineDOT 703.06 Aggregate Subbase Base Type D	12”
Woven Geotextile Subgrade Fabric	Mirafi 600X
Modulus of Subgrade Reaction	100 psi/in (pci)

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. Hot mix asphalt pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 4.5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated.

4.10 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.11 Design Review and Construction Testing

S.W.COLE should be retained to review the construction documents prior to bidding to determine that our earthwork, foundation and pavement recommendations have been properly interpreted and implemented.

A quality assurance testing and inspections program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities, the installation of piles, the preparation of foundation casting surfaces and pavement subgrades, as well as to provide testing and IBC Special Inspection services for soils, concrete, steel, spray-applied fireproofing, structural masonry and asphalt construction materials.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.

Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

JAD/TJB:tjb/pfk

DRAFT

APPENDIX A - Limitations

This report has been prepared for the exclusive use of Woodard & Curran for specific application to the proposed Cold Storage Warehouse at the Maine Port Authority on West Commercial Street in Portland, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

APPENDIX B

Figures

WEST COMMERCIAL STREET
U.S. ROUTE 1A
PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST.

LAND NOW OR FORMERLY
OWNED BY
NEW YARD, LLC
30887/247

FORE RIVER

PROPOSED COLD
STORAGE FACILITY
FFE = 14.00

COLD STORAGE COMPARTMENT A

COLD STORAGE COMPARTMENTS

S-2 LOW HAZARD OCCUPANCY

LOADING DOCK
S-2 LOW HAZARD OCCUPANCY

REFRIGERATION EQUIPMENT

MAIN ELECTRICAL

ADMINISTRATION

BUSINESS USE OCCUPANCY

MAINTENANCE

DOCK SUPPORT

DOCK OFFICES

GAS FACILITY

CONC. PAD

GATE

METAL FENCE

CHAIN LINK FENCE

TRANS. ON CONC. PAD

20' WIDE CMP EASEMENT

TRANS. ON CONC. PAD ELEC. METER

GAS WITNESS SIGNS

HIGHEST ANNUAL TIDE LINE ELEVATION 7.2 NGVD 1929

PIER

FORMER HARBOR COMMISSIONERS

JELLYFISH

PAVEMENT REMAINS

CONC. REMAINS

GRAVEL

RIP RAP

B-1001
B-1001A
B-1002
B-1003
B-1004
B-1005
B-2001
B-2002 (OMITTED)
B-2003
B-106 (H&A)
B-107 (H&A)

CPT18-01 (OMITTED)
CPT18-002
CPT18-003 (OMITTED)
CPT18-004
CPT18-05
CPT18-06
CPT18-07
CPT18-08
CPT18-09
CPT18-010
CPT18-011
CPT18-012
CPT18-013 (OMITTED)
CPT18-014

LINE 1
LINE 2
LINE 3

CB1 CB3 CB4 CB5 CB7 CB8 CB10 CB11
DMH1 DMH2 DMH3 DMH4
S4A S4B S4C S4D
PIPE 1 PIPE 2 PIPE 3 PIPE 4 PIPE 5 PIPE 6 PIPE 7 PIPE 8 PIPE 11 PIPE 13 PIPE 15 PIPE 16 PIPE 17

N:295843.13
E:2927103.20

N:295526.82
E:2927576.64

N16°58'37"W
149.35'

S70°47'58"W
381.52'

N73°01'23"E
1053.20'

S62°18'00"W
600'±

N16°58'37"W
600'±

117'±

RIM=15.85
RIM=17.20
CL INV.=3.2 SMH
RIM=15.00
CL INV.=8.5
RIM=13.10
INV. IN=4.4 18"
INV. IN=4.4 8"
INV. IN=5.8 12"
INV. OUT=4.3 18"
RIM=12.65
INV. IN(A)=9.93
INV. IN(B)=9.96
INV. OUT=10.91
RIM=12.81
INV. OUT=10.06"
RIM=12.77
INV. IN=11.17
INV. OUT=11.02
RIM=12.96
CL INV.=6.3
RIM=12.86
INV. IN=7.55
INV. OUT=7.48
RIM=12.73
INV.=10.13 HOOD
RIM=13.12
INV.=6.62 12"PVC W/HOOD
RIM=13.21
INV. IN=6.31 12"
INV. IN=5.91 15"
INV. OUT=5.86
RIM=13.06
INV. OUT=7.96
RIM=10.4
CL INV.=2.0
INV. IN=6.9 8"
SMH RIM=
CL INV.=3.1
SMH
RIM=14.65
CL INV.=2.0
INV. IN=3.8
INV. OUT=3.7

12.6
12.8
13
13.2
13.4

30" WIDE SE
EASEMENT T
OF PORTLA
31021/187
31378/33

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=30' SCALE PLAN OF THE SITE ENTITLED 'GRADING, DRAINAGE AND EROSION CONTROL PLAN,' PREPARED BY WOODARD & CURRAN, DATED FEBRUARY 2020.
2. BORINGS B-1001 THROUGH B-1005 WERE PERFORMED UNDER THE DIRECTION OF S. W. COLE ENGINEERING, INC (S.W.COLE) IN DECEMBER 2017 AND LOCATED IN THE FIELD BY MEASUREMENTS FROM EXISTING SITE FEATURES.
2. BORINGS B-2001THROUGH B-2003 AND CPT18-01 THROUGH CPT18-014 WERE PERFORMED UNDER THE DIRECTION OF S.W.COLE IN SEPTEMBER 2018 AND LOCATED IN THE FIELD BY GPS SURVEY USING A MAPPING GRADE TRIMBLE GPS RECEIVER.
3. BORINGS B-106 (H&A) AND B-107 (H&A) WERE PERFORMED UNDER THE DIRECTION OF HALEY & ALDRICH IN (DATE).
4. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
5. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 30 60 Feet

NO.	DATE	DESCRIPTION	BY
2	03/06/2020	DRAFT II GEOTECHNICAL REPORT	CEM
1	10/19/2018	DRAFT GEOTECHNICAL REPORT	CEM
0	01/30/2018	PRELIMINARY GEOTECHNICAL DATA	CEM

S.W.COLE ENGINEERING, INC.

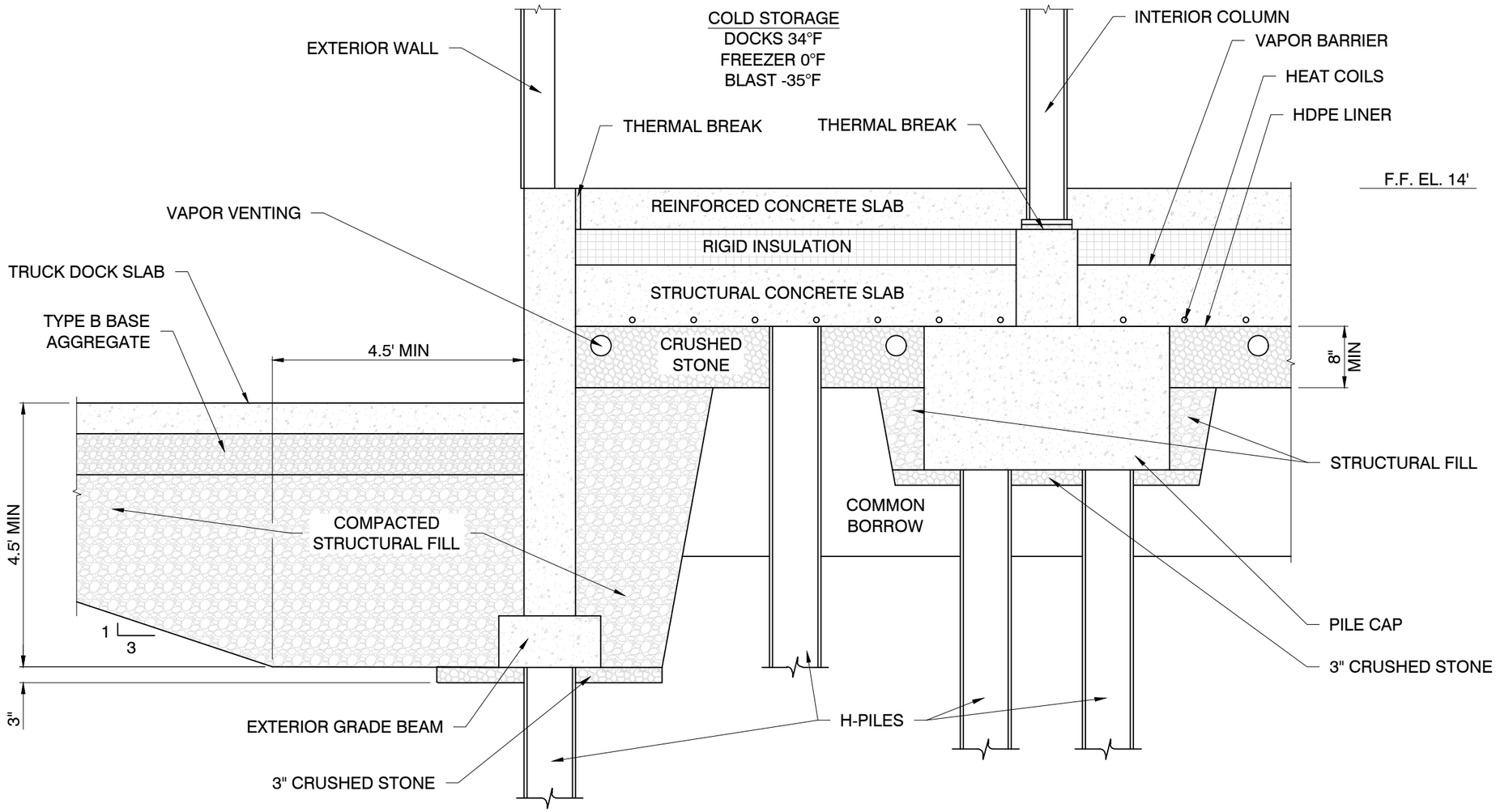
WOODARD & CURRAN

EXPLORATION LOCATION PLAN

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.: 16-1314 Scale: 1" = 30'
Date : 01/05/2018 Sheet: 1

R:\SWC\16-1314\CAD\Drawings\16-1314-EP.dwg, 3/6/2020 8:33:25 AM, 11, DSA, S. W. Cole Engineering, Inc.



S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED COLD STORAGE WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	04/20/2020	Sheet:	2

APPENDIX C

Exploration Logs and Key

BORING LOG

CLIENT: Colby Co. Engineering
PROJECT: Proposed IMT Cold Storage
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B2001
SHEET: 1 of 3
PROJECT NO. 16-1314.1
DATE START: 9/19/2018
DATE FINISH: 9/21/2018

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 11' +/- | **TOTAL DEPTH (FT):** 131.0 | **LOGGED BY:** Justin DuBois
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.75 | **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 7 ft 9/19/2018
GENERAL NOTES: 20 feet of casing broke off durring removal, abandoned in place.

KEY TO NOTES AND SYMBOLS: Water Level; ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling; D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear; Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot; WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector; S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10										Loose, brown to black SAND with gravel and silt (Fill), strong napthalene odor and sheen.		Backfilled with cuttings (medium to coarse sand) from 15' to surface
5	5										▽	
0	10		1D		10-12	24/8	2-1-3-4					
-5	15											Back filled with Bentonite from 40' to 15'
-10	20		2D		20-22	24/12	1-1:12"-3			20.0 Very loose, dark gray, sandy SILT with shells and organics (Bay Mud), slight naphalene odor.		
-15	25											
-20	30		3D		30-32	24/24	WOH:21"-1			30.0 Very soft, gray, silty CLAY some fine sand, few shell fragments.		
-25	35											

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B2001

BORING / WELL 16-1314.1.GPJ SWCE TEMPLATE.GDT 9/24/18

BORING LOG

CLIENT: Colby Co. Engineering
PROJECT: Proposed IMT Cold Storage
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B2001
SHEET: 2 of 3
PROJECT NO. 16-1314.1
DATE START: 9/19/2018
DATE FINISH: 9/21/2018

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-30			4D		40-42	24/24	WOR:6"-WOH:12"-1					Boring caved overnight to 40'
	45											
-35												
	50		5D		50-52	24/24	WOH:18"-2					
-40												
	55									55.0 Very soft, gray, sandy silty CLAY.		
-45												
	60		6D		60-62	24/24	WOR:6"-WOH:12"-1					
-50												
	65									65.0 Medium dense to dense, gray, medium SAND some silt, coarse sand layers.		
-55												
	70		7D		70-72	24/13	4-6-10-16					
-60												
	75											
-65												
	80		8D		80-82	24/24	12-18-19-25					
-70												
	85											
-75												
	90		9D		90-92	24/24	12-14-13-16					
-80												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B2001

BORING / WELL 16-1314.1.GPJ SWCE TEMPLATE.GDT 9/24/18

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Colby Co. Engineering
PROJECT: Proposed IMT Cold Storage
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B2001
SHEET: 3 of 3
PROJECT NO. 16-1314.1
DATE START: 9/19/2018
DATE FINISH: 9/21/2018

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-85	95											
-90	100		10D		100-102	24/24	9-10-13-20					
-95	105											
-100	110											
-105	115											
-110	120									120.0		
-115	125									Advanced with 3" Roller cone bit.		
-120	130											

Auger Refusal at 131.0 feet
Hard drilling and drill bit chatter, presumed Glacial Till.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B2001

BORING / WELL 16-1314.1.GPJ SWCE TEMPLATE.GDT 9/24/18

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Colby Co. Engineering
PROJECT: Proposed IMT Cold Storage
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B2003
SHEET: 1 of 3
PROJECT NO. 16-1314.1
DATE START: 9/18/2018
DATE FINISH: 9/19/2018

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 10' +/- | **TOTAL DEPTH (FT):** 122.0 | **LOGGED BY:** Justin DuBois
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.75 | **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft):
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
										Augered through loose, SAND with gravel and cobbles (Fill), napthalene odor and sheen.		Backfilled with cuttings (medium sand) from 15' to surface.
5	5											
0	10		1D		10-12	24/0	1-1-1-3					
-5	15											Backfilled with Bentonite from 41' to 15'
-10	20		2D		20-22	24/3	2-1:12"-1			20.0 Very loose, dark gray, sandy SILT with shells and organics (Bay Mud), slight naphalene odor.		
-15	25											
-20	30		3D		30-32	24/24	WOH:24"			30.0 Very soft, gray, silty CLAY some fine sand.		
-25	35											

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B2003

BORING / WELL 16-1314.1.GPJ SWCE TEMPLATE.GDT 9/24/18

BORING LOG

CLIENT: Colby Co. Engineering
PROJECT: Proposed IMT Cold Storage
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B2003
SHEET: 2 of 3
PROJECT NO. 16-1314.1
DATE START: 9/18/2018
DATE FINISH: 9/19/2018

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			4D		40-42	24/24	WOH:24"					Backfilled with gravel to 41'
-35	45											
-40	50		5D		50-52	24/24	WOH:12"-2-3			Increased shell fragments and wood.		
-45	55									55.0 Soft, gray, sandy silty CLAY.		
-50	60		6D		60-62	24/24	3-2-2-3					
-55	65											Boring caved overnight to 67'
-60	70		7D		70-72	24/12	5-4-4-8					
-65	75											
-70	80		8D		80-82	24/8	16-26-24-29			80.0 Dense to very dense, gray, medium SAND some silt, coarse sand layers.		
-75	85											
-80	90		9D		90-92	24/12	20-30-29-28					

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B2003

BORING / WELL 16-1314.1.GPJ SWCE TEMPLATE.GDT 9/24/18

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Colby Co. Engineering
PROJECT: Proposed IMT Cold Storage
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B2003
SHEET: 3 of 3
PROJECT NO. 16-1314.1
DATE START: 9/18/2018
DATE FINISH: 9/19/2018

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-85	95									Drill bit chatter; coarse sand or gravel layer.		
-90	100		10D		100-102	24/12	21-28-41-54					
-95	105											
-100	110		11D		110-112	24/10	11-13-22-25					
-105	115											
-110	120		12D		120-122	24/12	18-19-17-22			120.0		

Bottom of Exploration at 122.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B2003

BORING / WELL 16-1314.1.GPJ SWCE TEMPLATE.GDT 9/24/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001
SHEET: 1 of 1
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 14' +/- | **TOTAL DEPTH (FT):** 25.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 4 ft 12/20/2017 Free water at 4'
GENERAL NOTES: Backfilled borehole with bentonite and drill cuttings.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0.5-2.5	24/18	13-9-7-8			Medium dense, brown silty gravelly SAND (FILL)		
										2.0 Medium dense to loose, black gravel, some silt, some sand with wood (FILL) -petroleum odor	▽	
10	5		2D		5-7	24/12	5-4-6-4					
5	10		3D		10-12	24/12	4-3-4-3			-petroleum odor and sheen below 10'		
0	15		4D		15-17	24/10	3-3-4-3			FILL and coal tar		
-5	20		5D		20-21.8	21/5	8-7-6-50/3"			21.5 Concrete 22.0 Coal tar in casing prevented further drilling		
-10	25									25.0 Bottom of Exploration at 25.0 feet Abandoned hole at 25', excessive coal tar		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1001

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001A
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 14' +/- | **TOTAL DEPTH (FT):** 52.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 5 ft 12/20/2017 Soils saturated below 5'
GENERAL NOTES: Moved boring 25' +/- west of B-1001. Backfilled borehole with bentonite and drill cuttings.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
										Brown-black gravelly silty SAND with brick (FILL)	▽	
10	5											
5	10											
0	15		1D		15-17	24/12	9-6-4-7			-petroleum odor and sheen		
-5	20		2D		20-22	24/22	WOH FOR 12"-2-3	w =31.2 % O =2.0%		19.0 Very loose to loose, gray SAND and silt, some clay with shells (Bay Mud)		
-10	25		3D		25-27	24/20	2-4-3-3			24.0 Loose to medium dense, gray SAND and silt with frequent silty clay layers		
-15	30		4D		30-32	24/18	3-5-5-6	w =24.5 %				
-20	35		5D		35-37	24/2	4-3-10-9					
-25												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1001A

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001A
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			6D		40-42	24/24	4-3-4-6	w =19.4 %		Loose to medium dense, gray silty SAND with clay layers		
-30	45		7D		45-47	24/24	WOH FOR 12"-5-5					
-35	50		8D		50-52	24/18	7-11-11-12	w =21.2 %		49.0 Medium dense, brown silty SAND with clay layers		
										52.0 Bottom of Exploration at 52.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1001A

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1002
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/27/2017
DATE FINISH: 12/27/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 12' +/- | **TOTAL DEPTH (FT):** 52.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.79 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 7 ft 12/27/2017 Soils saturated below 7'
GENERAL NOTES: Backfilled borehole with bentonite to 16' below ground surface.

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Concrete		
										1.1 Loose, brown silty SAND (FILL)		
10			1D		3-5	24/126	4-4-3-2					
	5		2D		5-7	24/15	4-4-4-4					
5										6.5 Loose, black silty SAND (FILL) -petroleum odor	▽	
	10		3D		10-12	24/14	4-7-9-6			9.0 Medium dense, gray gravelly SAND, some silt -petroleum odor		
0												
	15		4D		15-17	24/11	4-1-1-1	w =28.8 % O =1.9%		14.0 Very loose, gray silty SAND with organics -petroleum odor and sheen		
-5												
	20		5D		20-22	24/14	2-5-7-13			19.0 Medium dense, gray silty gravelly SAND		
-10												
	25		6D		25-27	24/14	3-3-9-7	w =25 %		24.0 Medium dense to loose, light brown silty SAND with silty clay layers		
-15												
	30		7D		30-32	24/12	4-8-8-7					
-20												
	35		8D		35-37	24/20	5-4-6-6	w =22.4 %				
-25												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1002

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1002
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/27/2017
DATE FINISH: 12/27/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-30	45		9D		40-42	24/18	6-4-2-5			40.0 Loose, gray silty SAND, some gravel with silty clay layers		
-35	50		10D		50-52	24/14	4-8-18-19	w =23.1 %		45.0 Medium dense, gray SAND and silt		
-40										52.0 Bottom of Exploration at 52.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1002

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT:	Woodard & Curran
PROJECT:	Proposed IMT West Cold Storage Facility
LOCATION:	West Commercial Street, Portland, Maine

BORING NO.:	**B-1003**
SHEET:	1 of 2
PROJECT NO.	16-1314
DATE START:	12/21/2017
DATE FINISH:	12/21/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 12' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto

DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring

RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**

HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16

WATER LEVEL DEPTHS (ft): ▽ 4.5 ft 12/21/2017 Free water at 4.5'

GENERAL NOTES: Moved borehole 8-10' west after drilling through concrete at 4-5' and void from 5-10'. Backfilled borehole with bentonite to 16' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10										Medium dense, black-brown silty gravelly SAND with brick (FILL) -Petroleum odor at 5-7'		
	5		1D	D	5-7	24/19	5-12-8-3				▽	
5												
	10		2D	D	10-11.5	18/7	1-1-1-25/0"			Very loose		
0										11.5 Concrete		
	15		3D	D	15-17	24/13	6-12-12-16			13.0 Medium dense, black sandy SILT with ash (FILL) -Petroleum odor and sheen		
-5												
	20		4D	D	20-22	24/9	6-6-4-3	w =22.6 % O =1.7%		19.0 Medium dense to loose, gray-brown silty SAND with wood		
-10												
	25		5D	D	25-27	24/15	WOH-1-1-1	w =39.7 % O =2.8%		Very loose, gray sandy SILT with shells and organics (Bay Mud)		
-15												
	30		6D	D	30-32	24/24	WOH FOR 24"			29.0 Medium to stiff, gray silty CLAY with shells and organics to 32'		
-20												
	35		1U	U	35-37	24/24		W_L=55 W_P=30				
-25			1V	PID	37-37.5	6		S_V=1.55/0.31ksf				
			1V'	PID	37.5-38	6		S_V=1.61/0.31ksf				

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1003

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1003
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/21/2017
DATE FINISH: 12/21/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Medium to stiff, gray silty CLAY		
-30												
	45		2U		45-47	24/24						
								W_L=55				
								W_P=27				
-35			2V	PP	47-47.5	6		S_V=1.92/0.43ksf				
			2V'		47.5-48	6		S_V=2.11/0.62ksf				
	50											
-40												
	55		3U		55-57	24/24						
								W_L=48				
-45								W_P=25				
			3V	PP	57-57.5	6		S_V=1.61/0.43ksf				
			3V'		57.5-58	6		S_V=1.92/0.43ksf				
										59.0		
	60		7D		60-62	24/24	WOH-WOH FOR 12"-2			Very loose, gray SAND and silt with shells and wood		
-50												
	65		8D		65-67	24/24	1-1-2-2	w =23.6 %				
-55												
										69.0		
	70		9D		70-72	24/19	7-16-21-22	w =16.5 %		Dense, gray fine to medium SAND, some gravel, some silt		
-60												
	75											
-65												
										79.0		
	80		10D		80-82	24/21	8-18-20-29	w =20.6 %		Dense, gray silty fine to medium SAND		
-70										82.0		
										Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1003

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1004
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/18/2017
DATE FINISH: 12/18/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 10' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 8 ft 12/18/2017 Soils wet 5-7' and saturated below 8'.
GENERAL NOTES: Backfilled borehole with bentonite to 22' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/16	5-5-6-6			Medium dense, brown-gray-black silty gravelly SAND (FILL)		
5	5		2D		5-7	24/8	4-1-1-1			5.5 Very loose, gray SAND and silt, some clay with shells (FILL) -naphthalene odor	▽	
										8.0 Loose, brown-black silty SAND and gravel (FILL) -petroleum sheen and naphthalene odor		
0	10		3D		10-12	24/10	5-3-6-6					
-5	15		4D		15-17	24/12	2-3-2-2					
-10	20		5D		20-22	24/13	1-2-1-1	w =31 % O =1.8%		19.0 Very loose, gray SILT and sand, trace gravel with shells, organics (Bay Mud)		
-15	25		6D		25-27	24/24	WOH FOR 24"	w =48.3 % O =2.9%		24.0 Medium to stiff, gray silty CLAY with sand layers/seams		
-20	30		1U		30-32	24/12		W_L=47 W_P=28 w =53.4 % S_V=1.05/0.27ksf S_V=1.09+ksf				
			1V		32-32.7	8						
			1V'		32.7-33.4	8						
-25	35											

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1004

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1004
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/18/2017
DATE FINISH: 12/18/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			2U		40-42	24/24		W_L=53 W_P=29 w =54.6 %				
			2V		42-					could not advance vane		
-35	45									Medium to stiff, gray silty CLAY with occasional sand layers		
-40	50		3U		50-52	24/24		W_L=55 W_P=30 w =55.4 %				
			3V		52-					could not advance vane		
-45	55											
-50	60		7D		60-62	24/24	3-4-2-8	w =25.7 %		60.5 Loose, gray silty SAND with shells and wood		
-55	65		8D		65-67	24/14	3-6-4-3			64.5 Medium dense to loose, gray silty medium to coarse SAND with wood and occasional silty clay seams/layers		
-60	70		9D		70-72	24/18	WOR-5-8-15	w =21.7 %		69.0 Medium dense, gray SAND and silt with silty clay layers		
-65	75											
-70	80		10D		80-82	24/16	5-10-9-19	w =21 %		82.0 Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1004

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1005
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/19/2017
DATE FINISH: 12/19/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 11' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 8 ft 12/19/2017 Soils saturated below 8'
GENERAL NOTES: Backfilled borehole with bentonite to 19' below ground surface.

KEY TO NOTES AND SYMBOLS: Water Level; ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10			1D		0-2	24/16	3-6-11-18			Medium dense to very loose, brown-black silty gravelly SAND with brick (FILL) -petroleum odor and sheen below-		
5	5		2D		5-7	24/18	13-15-6-8				▽	
0	10		3D		10-12	24/18	1-2-1-2					
										11.0 Very loose to medium dense, gray SAND and silt, some gravel with shells and wood (Bay Mud)		
-5	15		4D		15-17	24/7	2-1-1-3					
-10	20		5D		20-22	24/16	4-6-5-6	w =25.5 % O =1.2%				
-15	25		6D		25-27	24/1	6-4-2-2			Cobble at 24'		
										28.0 Medium to stiff, gray silty CLAY with sand layers/seams		
-20	30		7D		30-32	24/5	1-1-2-3	w =38.9 % O =2.0%				
-25	35		1U		35-37	24/24		W_L=49 W_P=26 w =46.5 % S_V=2.05/0.31ksf S_V=1.86/0.31ksf				
			1V	PP	37-37.5	6						
			1V'		37.5-38	6						

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1005

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1005
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/19/2017
DATE FINISH: 12/19/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-30										Medium to stiff, gray silty CLAY with sand layers/seams		
	45		2U		45-47	24/22		W_L=54 W_P=29				
-35			2V	PP	47-47.5	6		w =51.1 % S_V=2.17/0.43ksf				
			2V'		47.5-48	6		S_V=2.17/0.62ksf				
	50											
-40												
	55		3U		55-57	24/21		W_L=43 W_P=24				
-45			3V	PP	57-57.5	6		w =41.2 % S_V=2.05/0.56ksf				
			3V'		57.5-58	6		S_V=2.17/0.50ksf				
	60									59.0		
-50			8D		60-62	24/18	4-3-4-5	w =23 %		Loose to medium dense, gray silty fine to coarse SAND with wood and pinecones		
	65		9D		65-67	24/16	6-7-11-15					
-55												
										69.0		
	70		10D		70-72	24/10	5-5-5-2	w =21.1 %		Loose to medium dense, gray SAND, some silt, some gravel		
-60												
										75.0		
	75									Medium dense, gray silty SAND		
-65												
	80		11D		80-82	24/18	2-5-11-13	w =21 %				
-70										82.0		
										Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1005

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

KEY TO NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

APPENDIX D

Cone Penetrometer Test Data Report

PRESENTATION OF SITE INVESTIGATION RESULTS

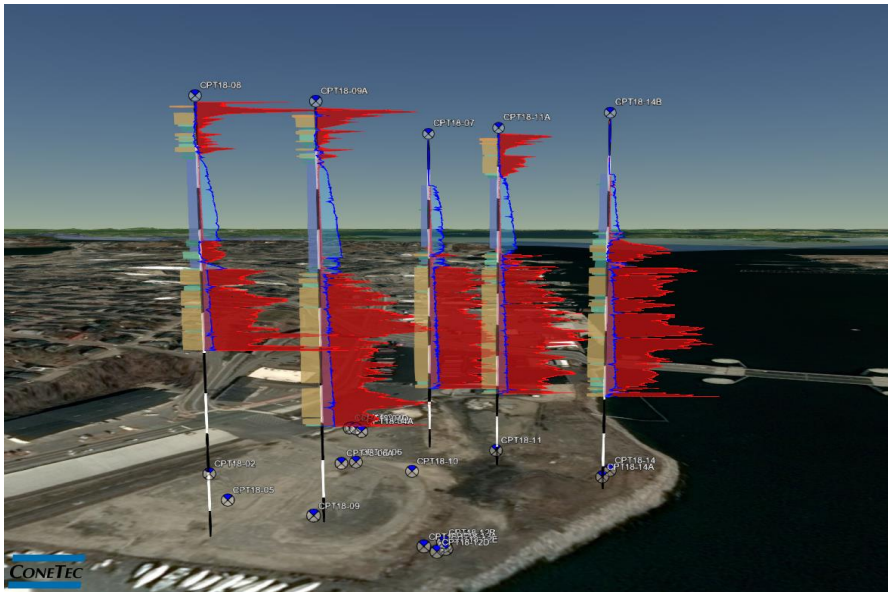
Proposed Cold Storage Warehouse
Portland, Maine

Prepared for:

S.W. Cole Engineering

ConeTec Job No: 18-53107

Project Start Date: 18-Sep-2018
Project End Date: 21-Sep-2018
Report Date: 25-Sep-2018



Prepared by:

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www.conetecdataservices.com

Introduction

The enclosed report presents the results of a cone penetration testing (CPTu or CPT) program carried out at the proposed Cold Storage Warehouse site located in Portland, Maine. The site investigation program was conducted by ConeTec Inc. (ConeTec), under contract to S.W. Cole Engineering (S.W. Cole) of Gray, Maine.

A total of 25 cone penetration tests were completed at 11 locations (there were numerous shallow refusals that were offset or drilled out and then reattempted to be pushed to depth). The CPT program was performed to evaluate the subsurface soil conditions. CPT sounding locations were selected and numbered under supervision of S.W. Cole personnel (Mr. Justin Dubois).

Project Information

Project	
Client	S.W. Cole Engineering
Project	Cold Storage Warehouse, Portland, ME
ConeTec project number	18-53107

A map from CESIUM including the CPT test locations is presented below.



Rig Description	Deployment System	Test Type
CPT Truck Rig	25 ton truck mounted (twin cylinders)	CPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT	GPS (GlobalSat MR-350)	32619 (WGS 84 / UTM North)

Cone Penetration Test (CPT)	
Depth reference	Ground surface at the time of the investigation.
Tip and sleeve data offset	0.1 meter. This has been accounted for in the CPT data files.
Pore pressure dissipation (PPD) tests	Twelve pore pressure dissipation tests were completed primarily to determine the phreatic surface.
Additional Comments	None.

Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
550:T1500F15U500	550	15	225	1500	15	500

Limitations

This report has been prepared for the exclusive use of S.W. Cole Engineering (Client) for the project titled "Cold Storage Warehouse, Portland, ME". The report's contents may not be relied upon by any other party without the express written permission of ConeTec. ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

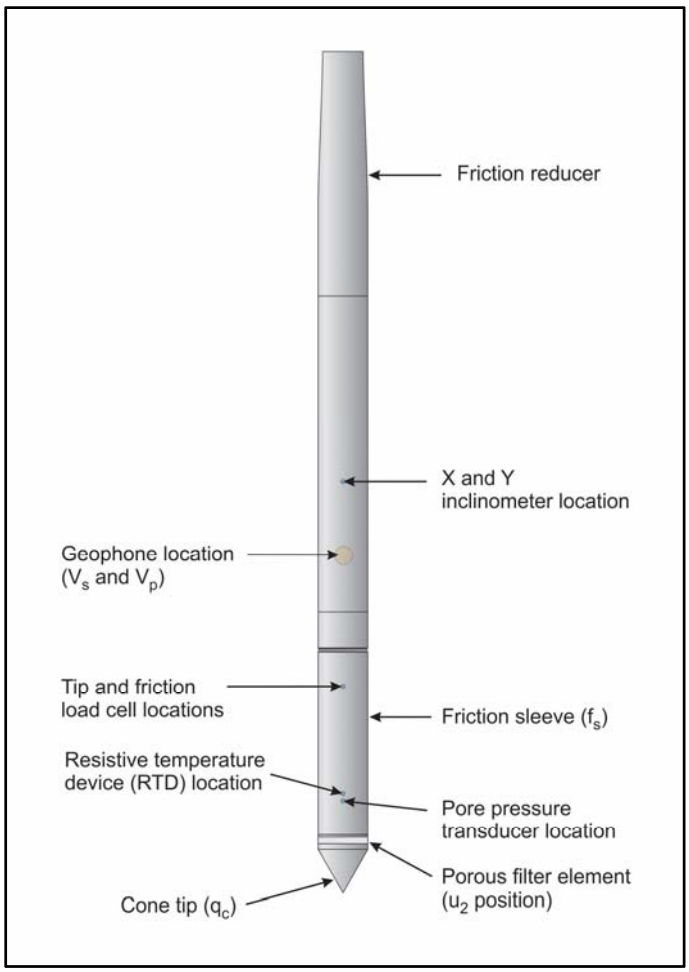


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerin under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high

friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is included in an appendix.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

References

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, “Cone Penetration Testing in Geotechnical Practice”, Blackie Academic and Professional.

Mayne, P.W., 2013, “Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests”, Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W. and Peuchen, J., 2012, “Unit weight trends with cone resistance in soft to firm clays”, Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Mayne, P.W., 2014, “Interpretation of geotechnical parameters from seismic piezocone tests”, CPT’14 Keynote Address, Las Vegas, NV, May 2014.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, “Use of Piezometer Cone Data”, Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., 1990, “Soil Classification Using the Cone Penetration Test”, Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, “Interpretation of cone penetration tests – a unified approach”, Canadian Geotechnical Journal, Volume 46: 1337-1355.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

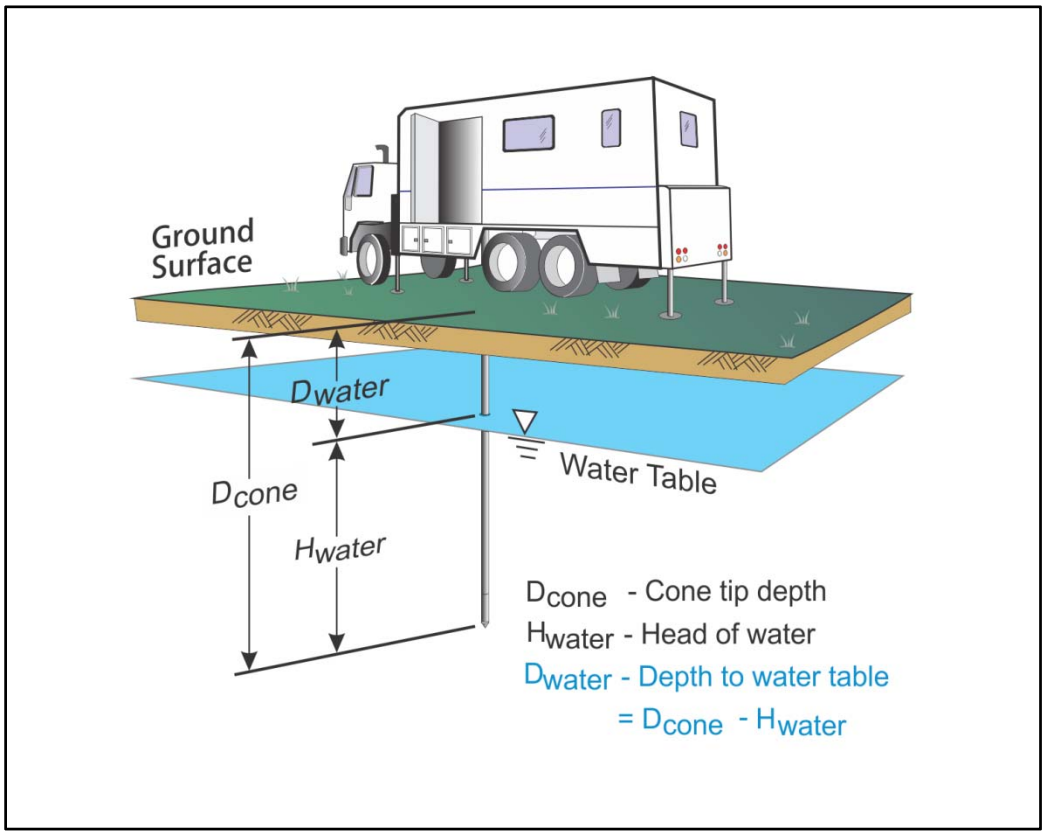


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

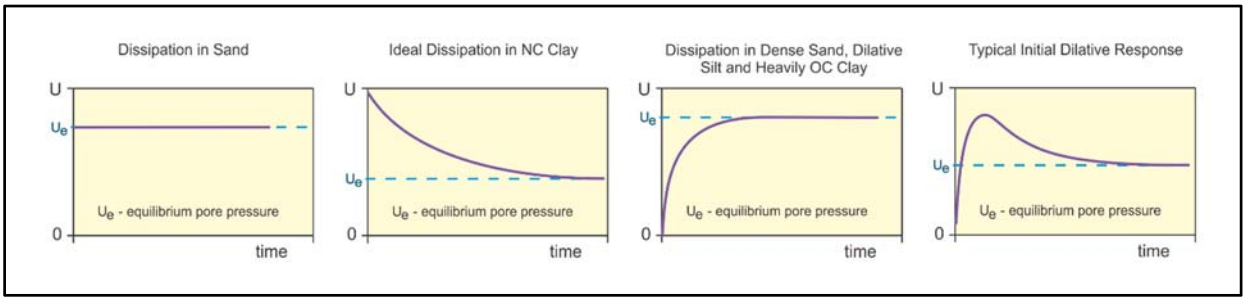


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

References

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, "An analytical study of the cone penetration test in clay", Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Advanced Cone Penetration Test Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Cone Penetration Test Summary and

Standard Cone Penetration Test Plots

Job No: 18-53107
Client: S.W. Cole Engineering
Project: Cold Storage Warehouse, Portland, ME
Start Date: 18-Sep-2018
End Date: 21-Sep-2018

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Northing[2] (m)	Easting (m)	Refer to Notation Number
CPT18-02	18-53107_CP02	9/19/2018	550:T1500F15U500	9.9	74.97	4833219	398173	
CPT18-04	18-53107_CP04	9/19/2018	550:T1500F15U500		3.94	4833244	398243	5
CPT18-04A	18-53107_CP04A	9/19/2018	550:T1500F15U500	5.4	19.44	4833237	398244	3
CPT18-04B	18-53107_CP04B	9/20/2018	550:T1500F15U500	5.4	19.36	4833244	398242	4
CPT18-04C	18-53107_CP04C	9/21/2018	550:T1500F15U500	5.4	20.10	4833242	398244	4
CPT18-04D	18-53107_CP04D	9/21/2018	550:T1500F15U500	5.4	21.00	4833242	398244	4
CPT18-05	18-53107_CP05	9/21/2018	550:T1500F15U500	8.3	78.82	4833191	398170	
CPT18-06	18-53107_CP06	9/19/2018	550:T1500F15U500	8.5	81.45	4833201	398222	4
CPT18-06A	18-53107_CP06A	9/21/2018	550:T1500F15U500	8.5	73.41	4833203	398217	
CPT18-07	18-53107_CP07	9/20/2018	550:T1500F15U500	6.1	139.84	4833210	398261	
CPT18-08	18-53107_CP08	9/21/2018	550:T1500F15U500	7.5	97.28	4833171	398158	
CPT18-09	18-53107_CP09	9/18/2018	550:T1500F15U500	7.3	8.12	4833163	398187	3
CPT18-09A	18-53107_CP09A	9/18/2018	550:T1500F15U500	7.3	132.54	4833162	398190	3
CPT18-10	18-53107_CP10	9/20/2018	550:T1500F15U500	9.4	89.16	4833181	398234	
CPT18-11	18-53107_CP11	9/18/2018	550:T1500F15U500	5.1	17.80	4833184	398275	4
CPT18-11A	18-53107_CP11A	9/18/2018	550:T1500F15U500	5.1	135.01	4833176	398269	
CPT18-12	18-53107_CP12	9/18/2018	550:T1500F15U500		4.59	4833126	398203	5
CPT18-12A	18-53107_CP12A	9/18/2018	550:T1500F15U500	5.2	14.93	4833123	398208	4
CPT18-12B	18-53107_CP12B	9/20/2018	550:T1500F15U500	5.2	8.86	4833125	398209	4
CPT18-12C	18-53107_CP12C	9/20/2018	550:T1500F15U500	5.2	89.89	4833125	398209	
CPT18-12D	18-53107_CP12D	9/20/2018	550:T1500F15U500	5.2	9.84	4833121	398204	4
CPT18-12E	18-53107_CP12E	9/21/2018	550:T1500F15U500	5.2	25.10	4833121	398207	4
CPT18-14	18-53107_CP14	9/18/2018	550:T1500F15U500		2.30	4833140	398292	5

Job No:	18-53107
Client:	S.W. Cole Engineering
Project:	Cold Storage Warehouse, Portland, ME
Start Date:	18-Sep-2018
End Date:	21-Sep-2018

CONE PENETRATION TEST SUMMARY

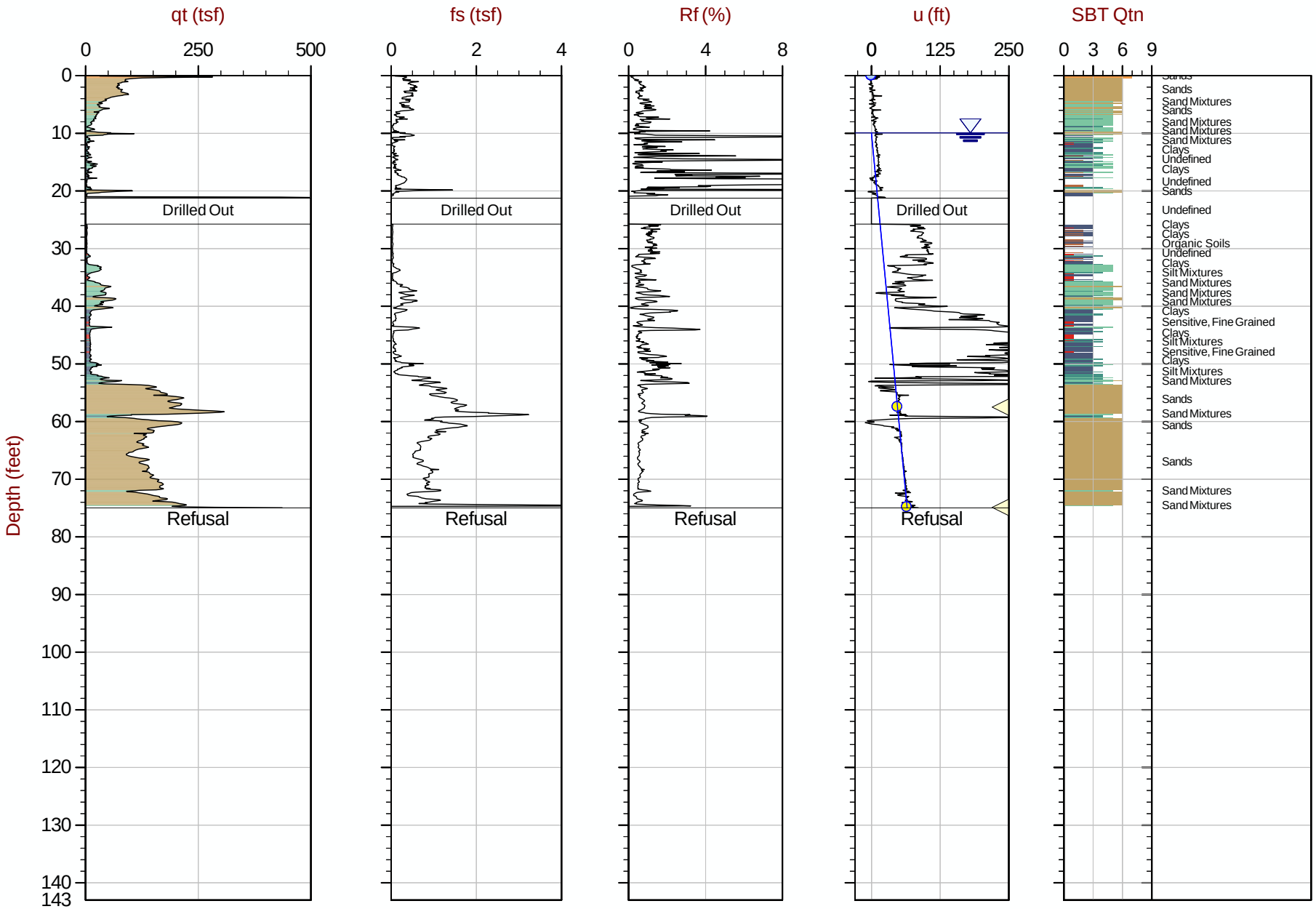
Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Northing[2] (m)	Easting (m)	Refer to Notation Number
CPT18-14A	18-53107_CP14A	9/18/2018	550:T1500F15U500		2.13	4833137	398285	5
CPT18-14B	18-53107_CP14B	9/20/2018	550:T1500F15U500	7.4	129.76	4833133	398281	
Totals	25 soundings				1299.61			

1. Assumed phreatic surface depths were determined from the pore pressure data unless otherwise noted. Hydrostatic data were used for calculated parameters.
2. Coordinates are WGS 84 / UTM Zone 19 and were collected using a MR-350 GlobalSat GPS Receiver.
3. Assumed phreatic surface estimated from the dynamic pore pressure response.
4. Assumed phreatic surface estimated from an adjacent CPT dynamic pore pressure response or a PPD test.
5. No phreatic surface detected.

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 23:26
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-02
Cone: 550:T1500F15U500



Max Depth: 22.850 m / 74.97 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP02.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833219m E: 398173m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

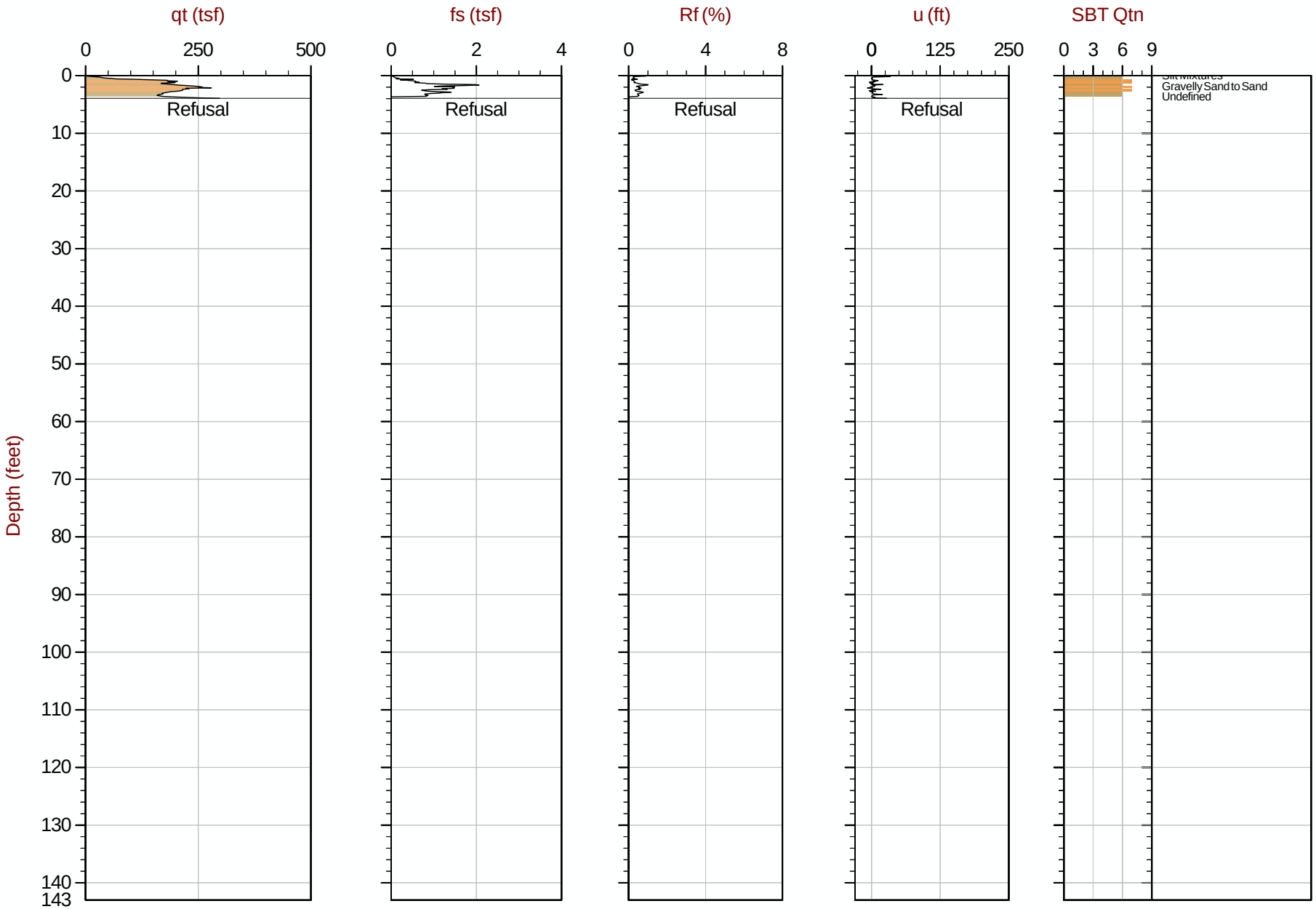
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 19:58
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-04
Cone: 550:T1500F15U500



Max Depth: 1.200 m / 3.94 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP04.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833244m E: 398243m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

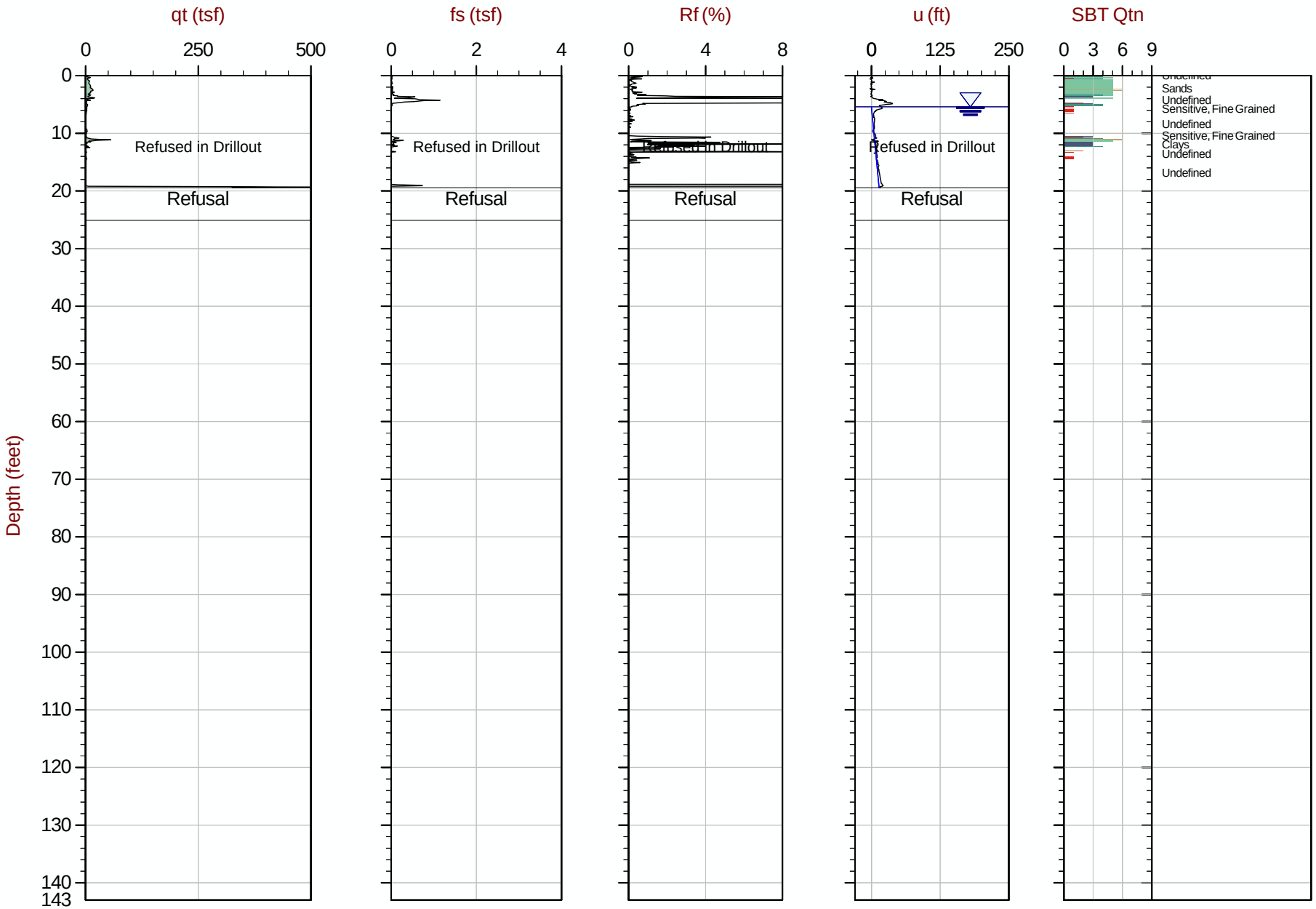
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 22:47
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-04A
Cone: 550:T1500F15U500



Max Depth: 5.925 m / 19.44 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP04A.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833237m E: 398244m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

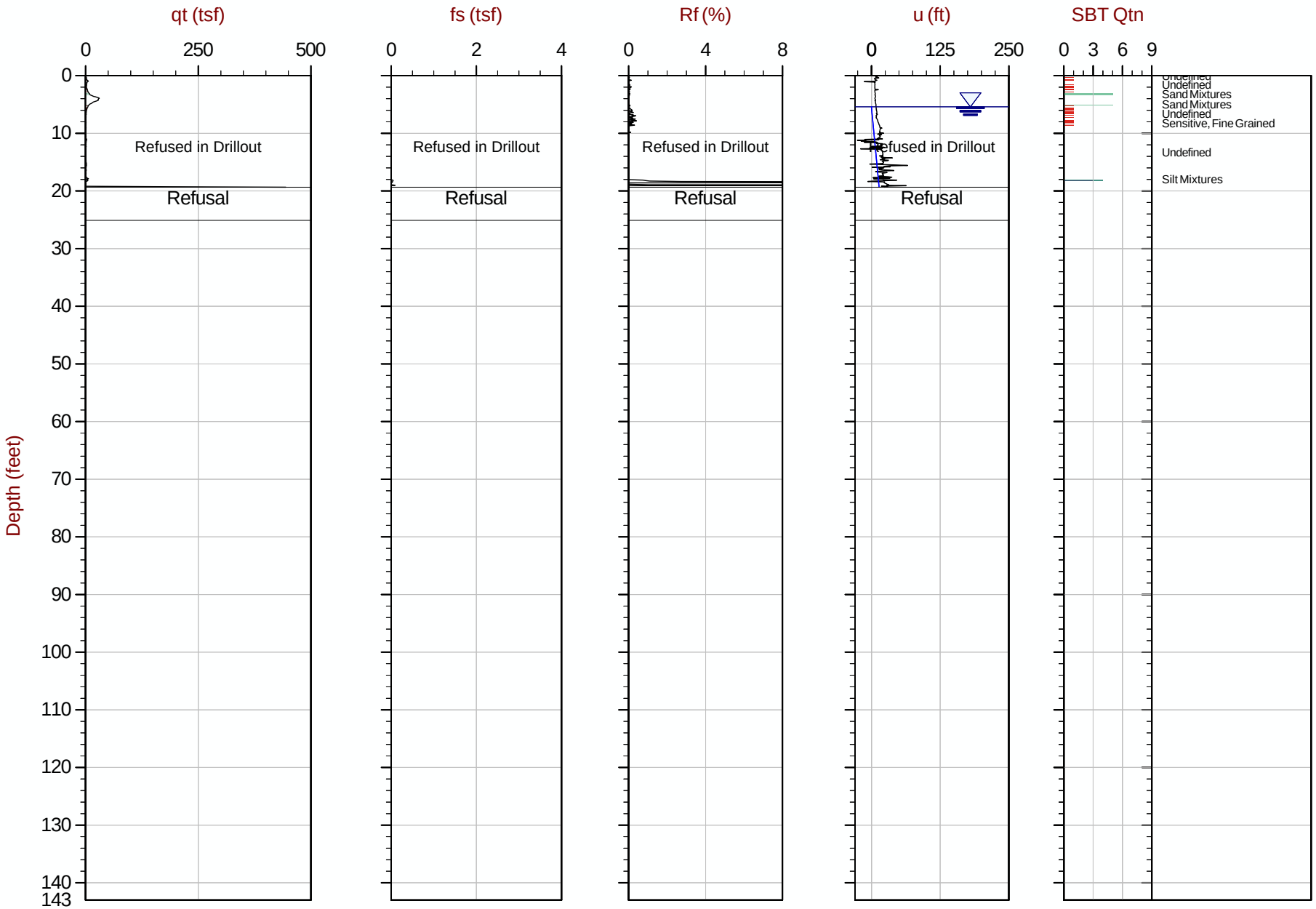
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 13:35
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-04B
Cone: 550:T1500F15U500



Max Depth: 5.900 m / 19.36 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP04B.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833244m E: 398242m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

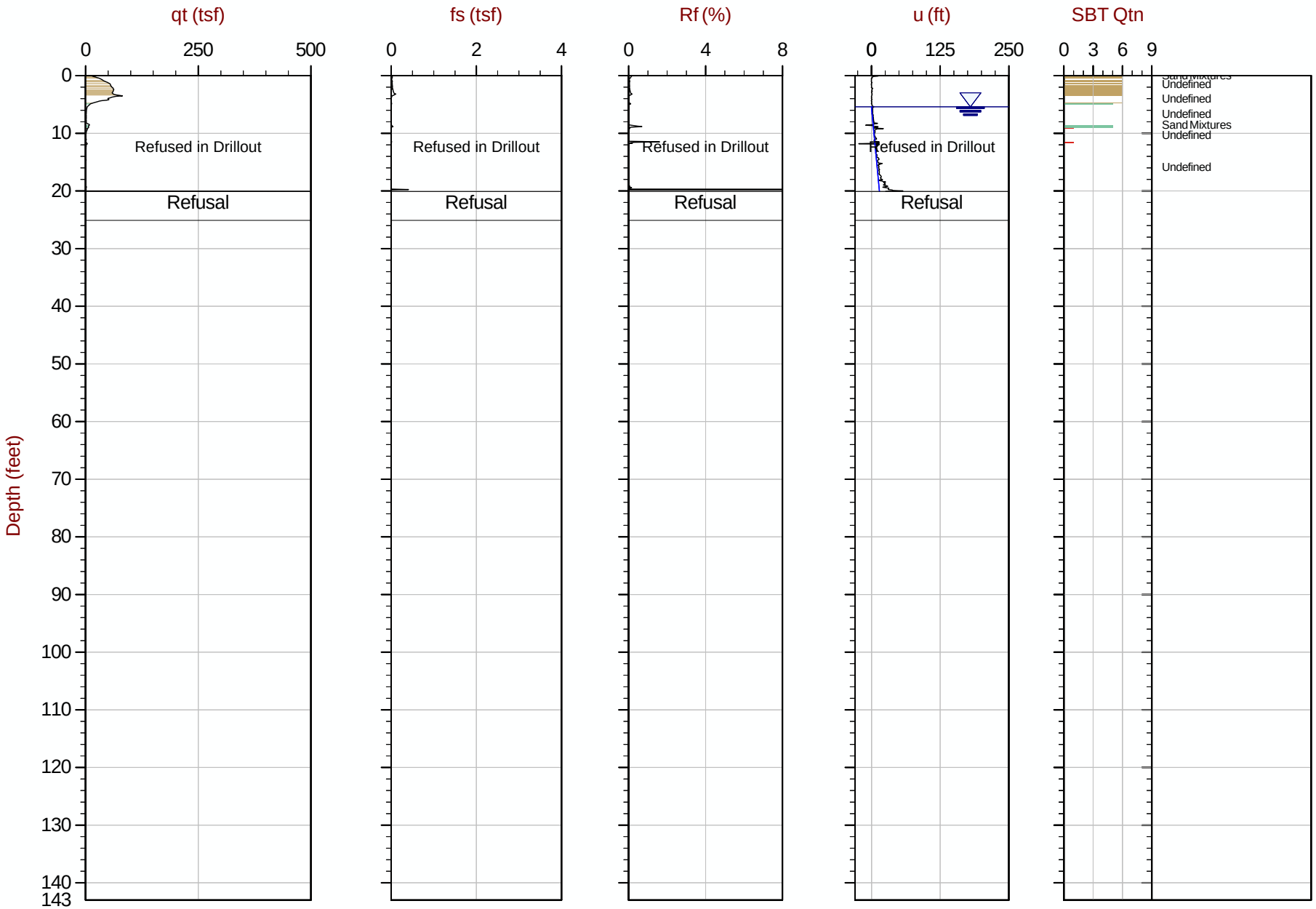
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 10:24
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-04C
Cone: 550:T1500F15U500



Max Depth: 6.125 m / 20.09 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP04C.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833242m E: 398244m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

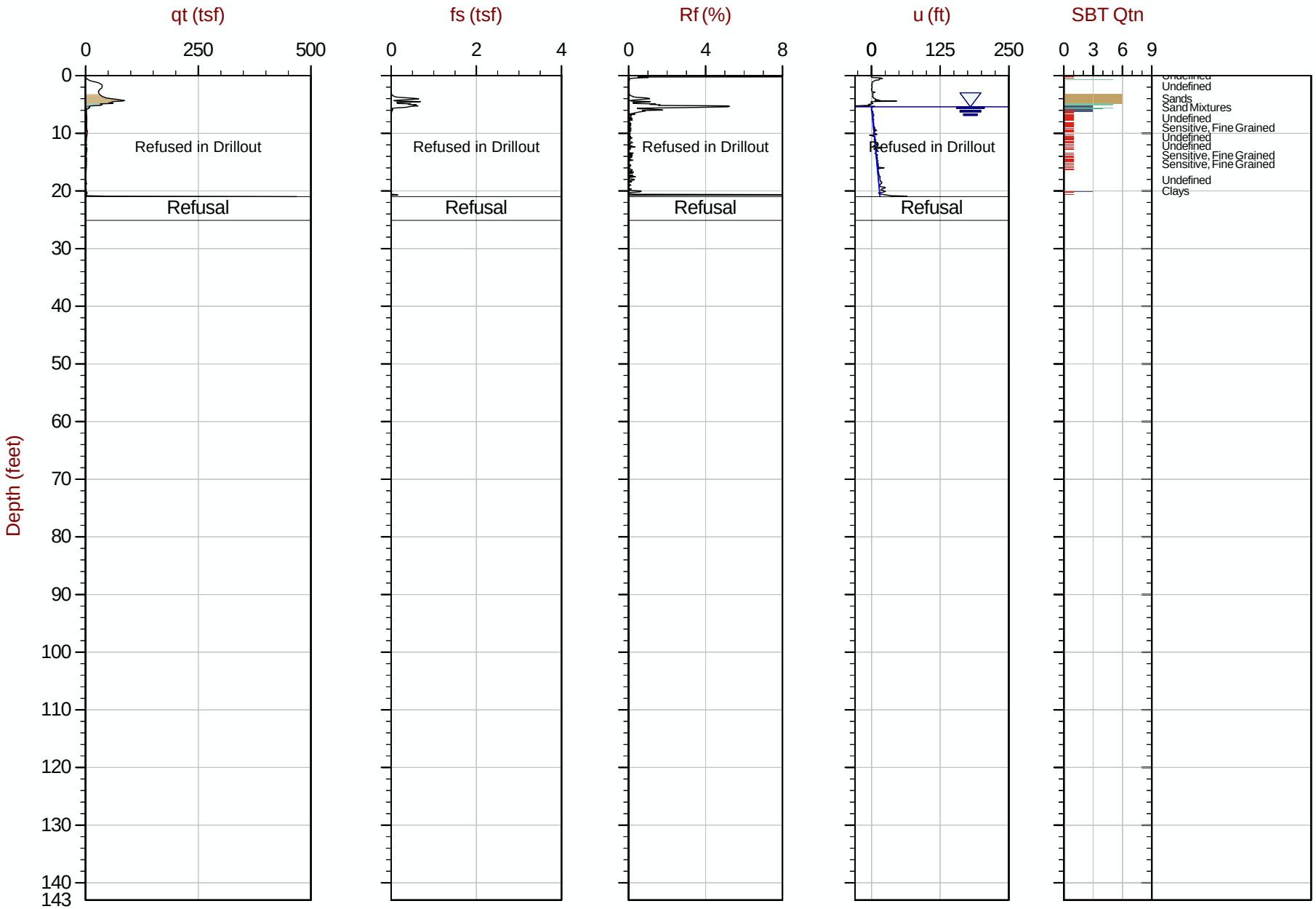
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 11:13
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-04D
Cone: 550:T1500F15U500



Max Depth: 6.400 m / 21.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP04D.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833242m E: 398244m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

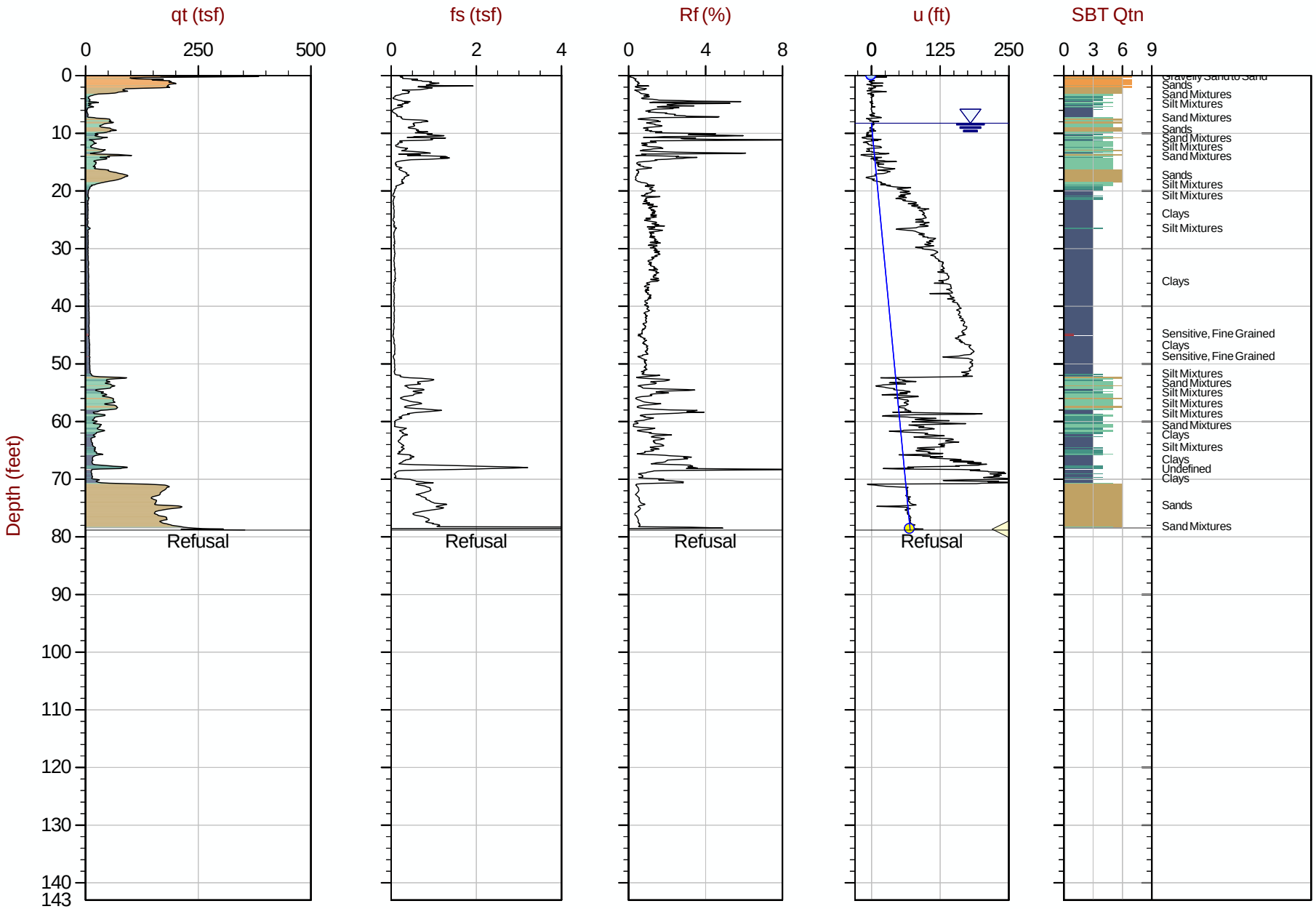
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 13:14
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-05
Cone: 550:T1500F15U500



Max Depth: 24.025 m / 78.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP05.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833191m E: 398170m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

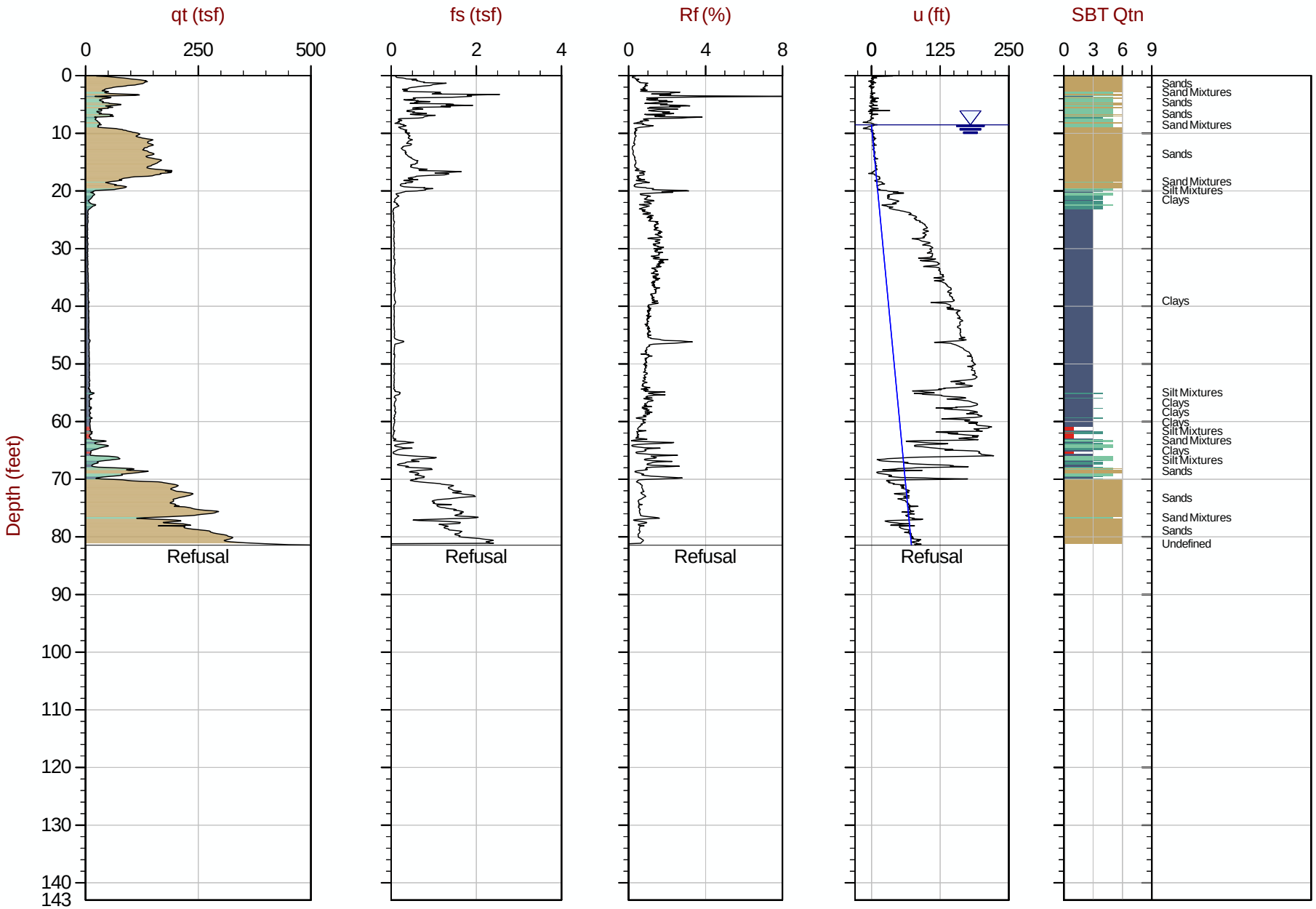
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 20:48
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-06
Cone: 550:T1500F15U500



Max Depth: 24.825 m / 81.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP06.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833201m E: 398222m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

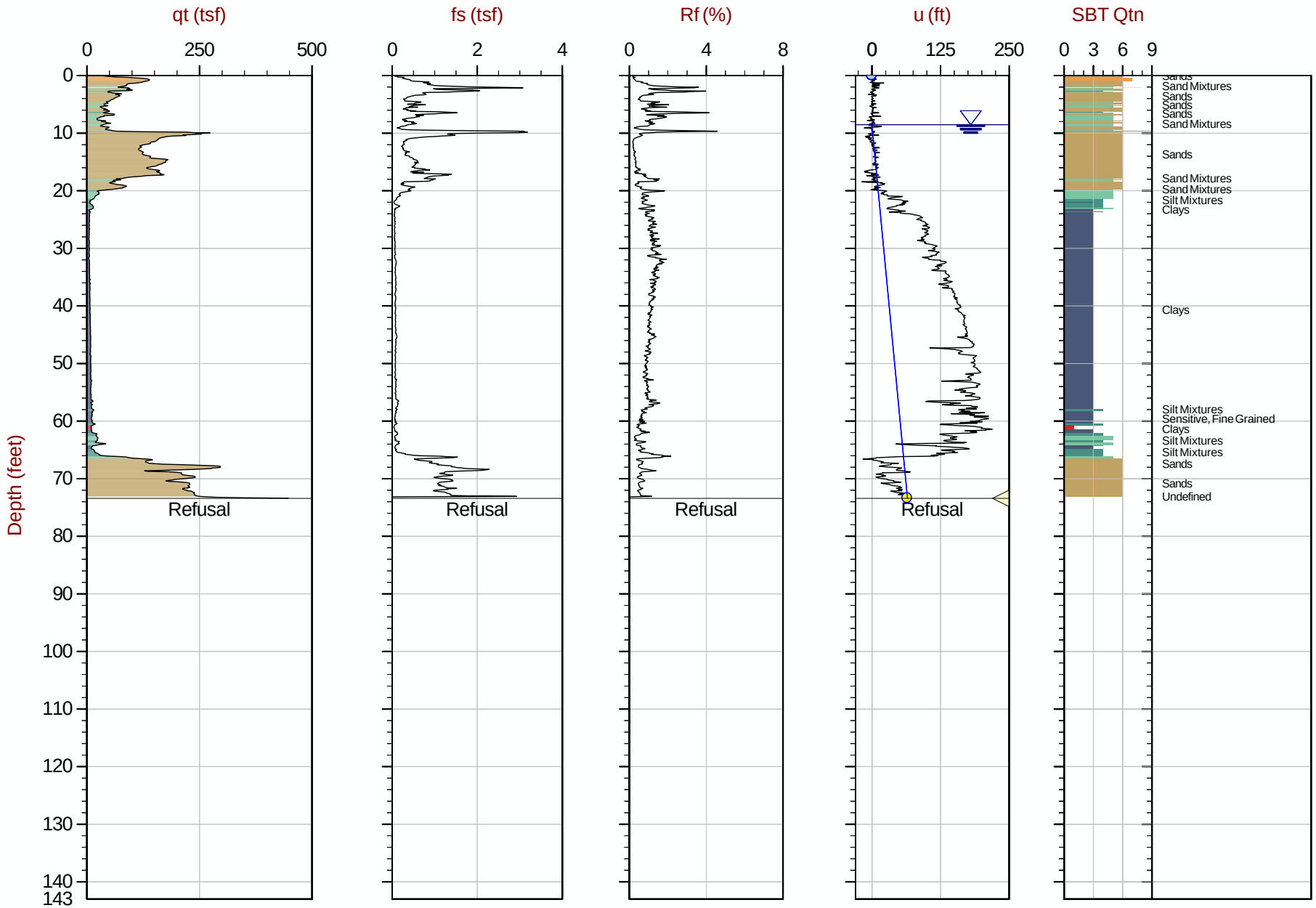
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 08:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-06A
Cone: 550:T1500F15U500



Max Depth: 22.375 m / 73.41 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP06A.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833203m E: 398217m

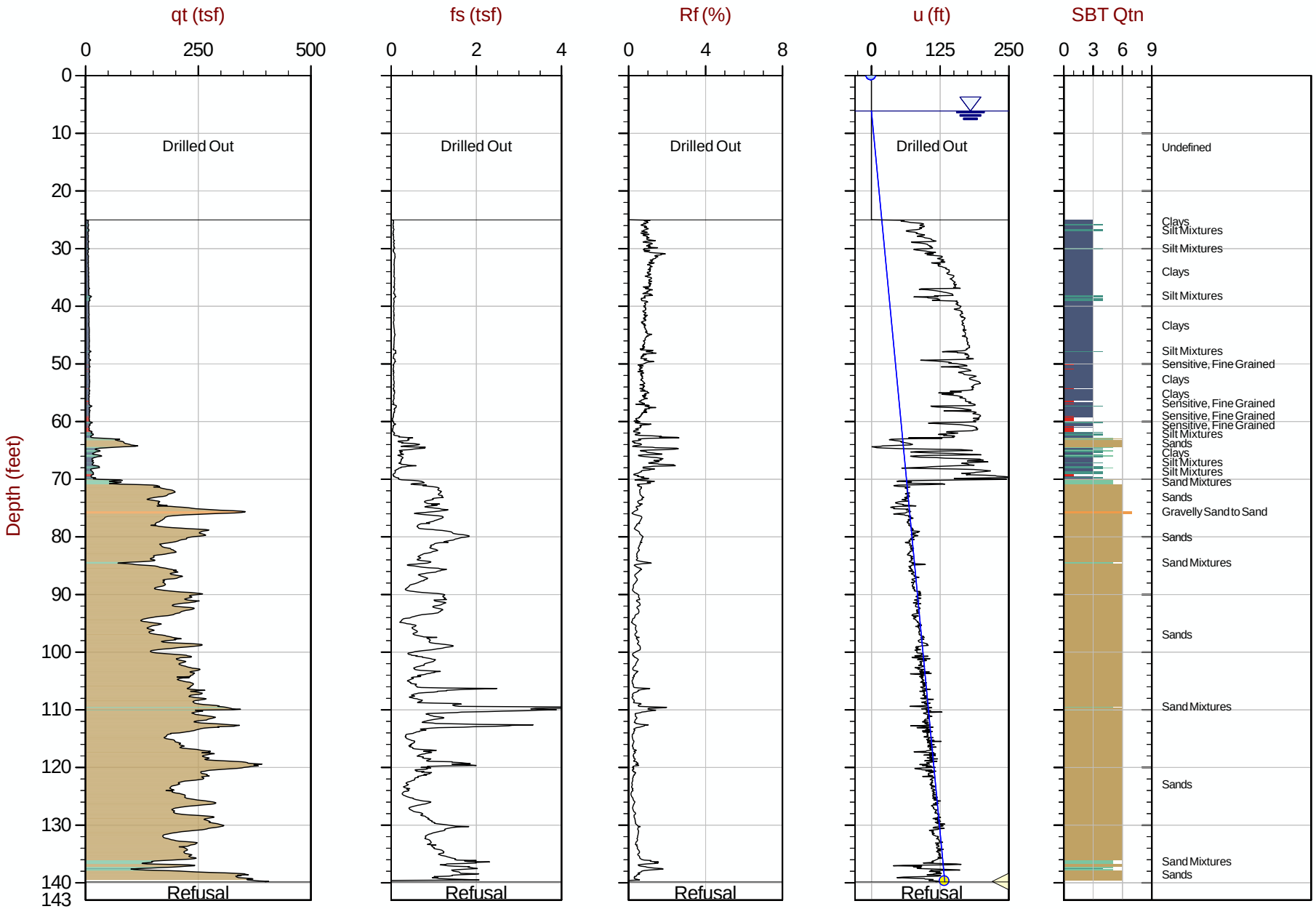
Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 14:41
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-07
Cone: 550:T1500F15U500



Max Depth: 42.625 m / 139.84 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP07.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833210m E: 398261m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

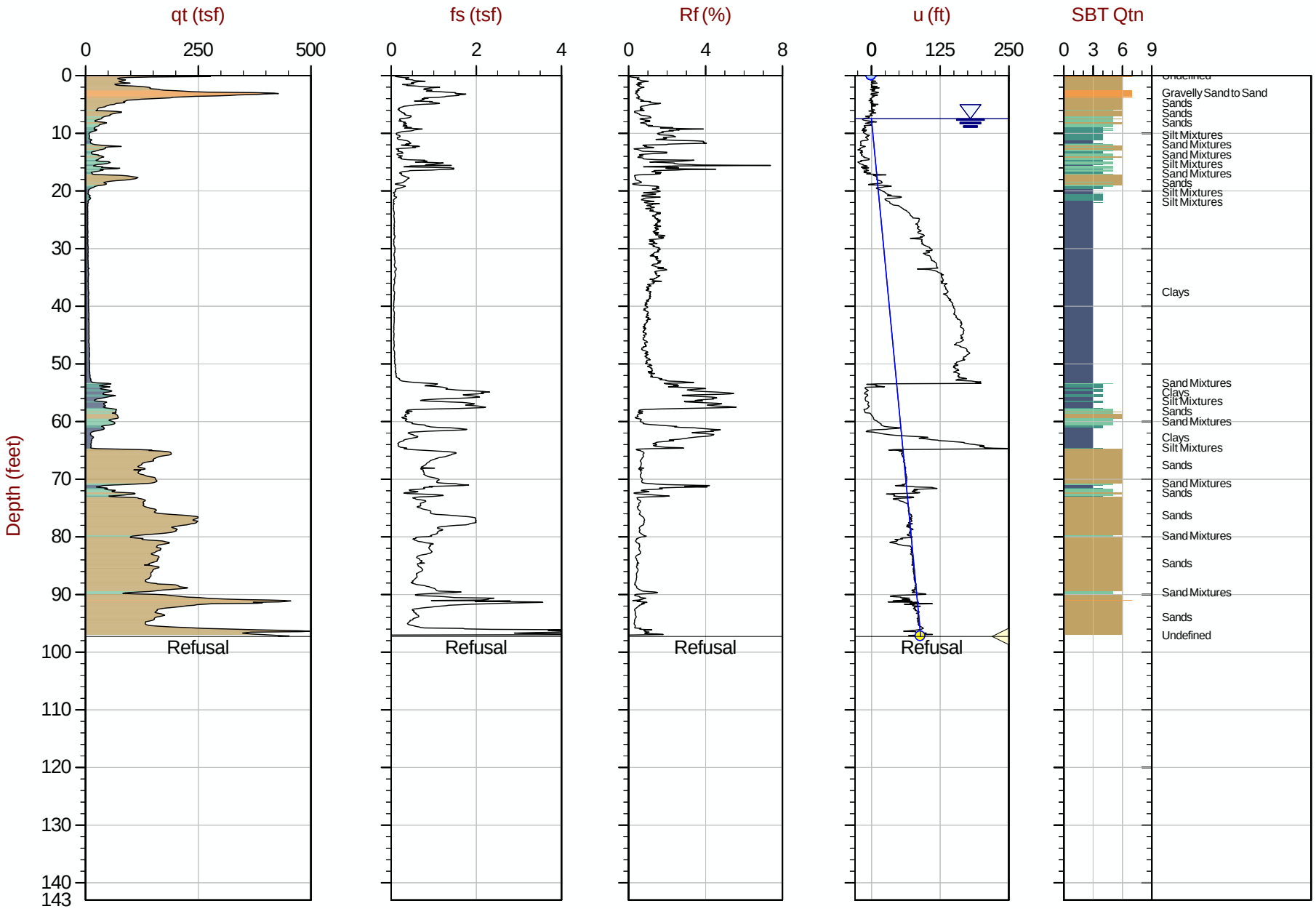
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 14:51
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-08
Cone: 550:T1500F15U500



Max Depth: 29.650 m / 97.28 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP08.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833171m E: 398158m

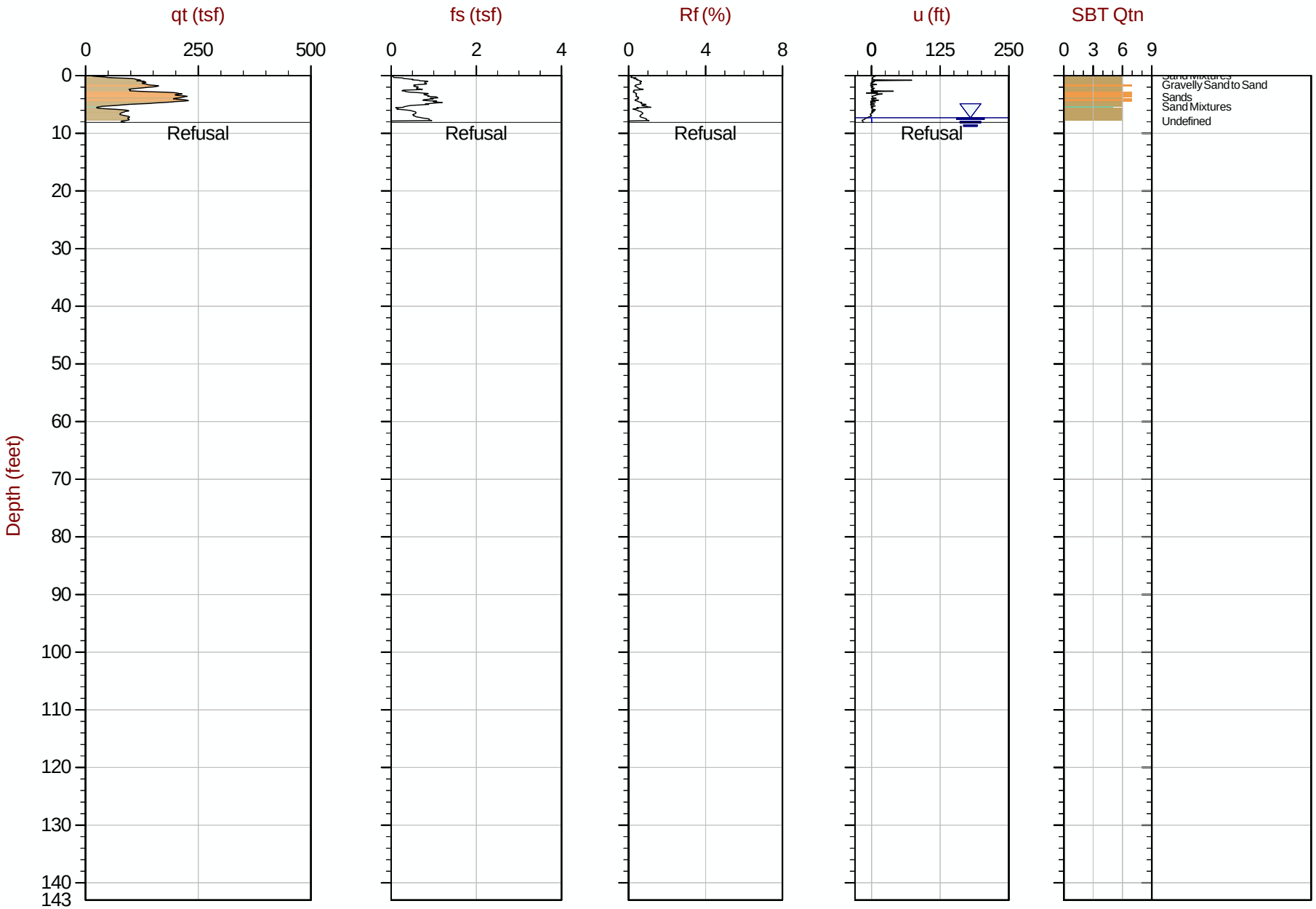
Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 13:58
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-09
Cone: 550:T1500F15U500



Max Depth: 2.475 m / 8.12 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP09.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833163m E: 398187m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

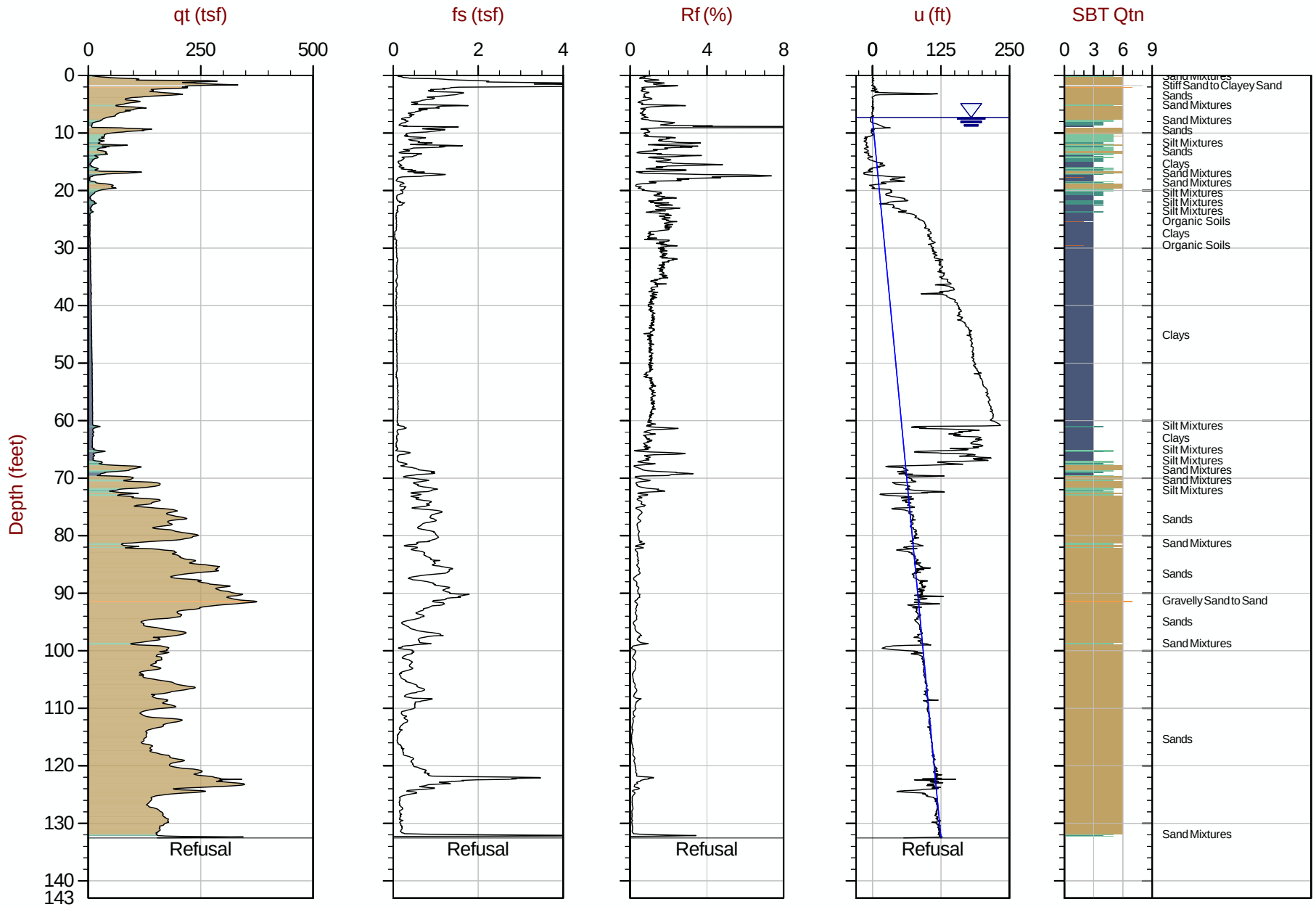
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 14:11
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-09A
Cone: 550:T1500F15U500



Max Depth: 40.400 m / 132.54 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP09A.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833162m E: 398190m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

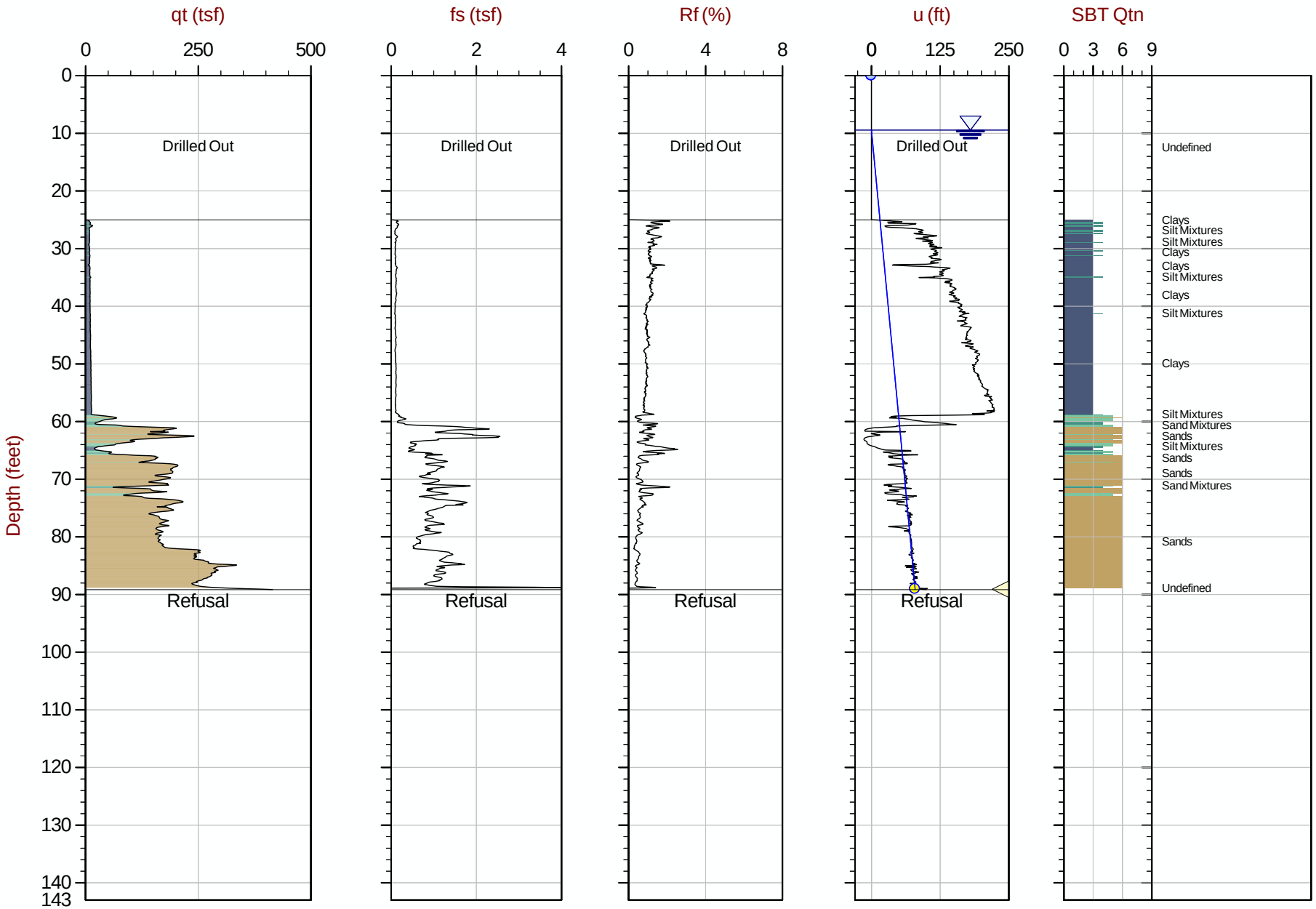
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 11:42
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-10
Cone: 550:T1500F15U500



Max Depth: 27.175 m / 89.16 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP10.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833181m E: 398234m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

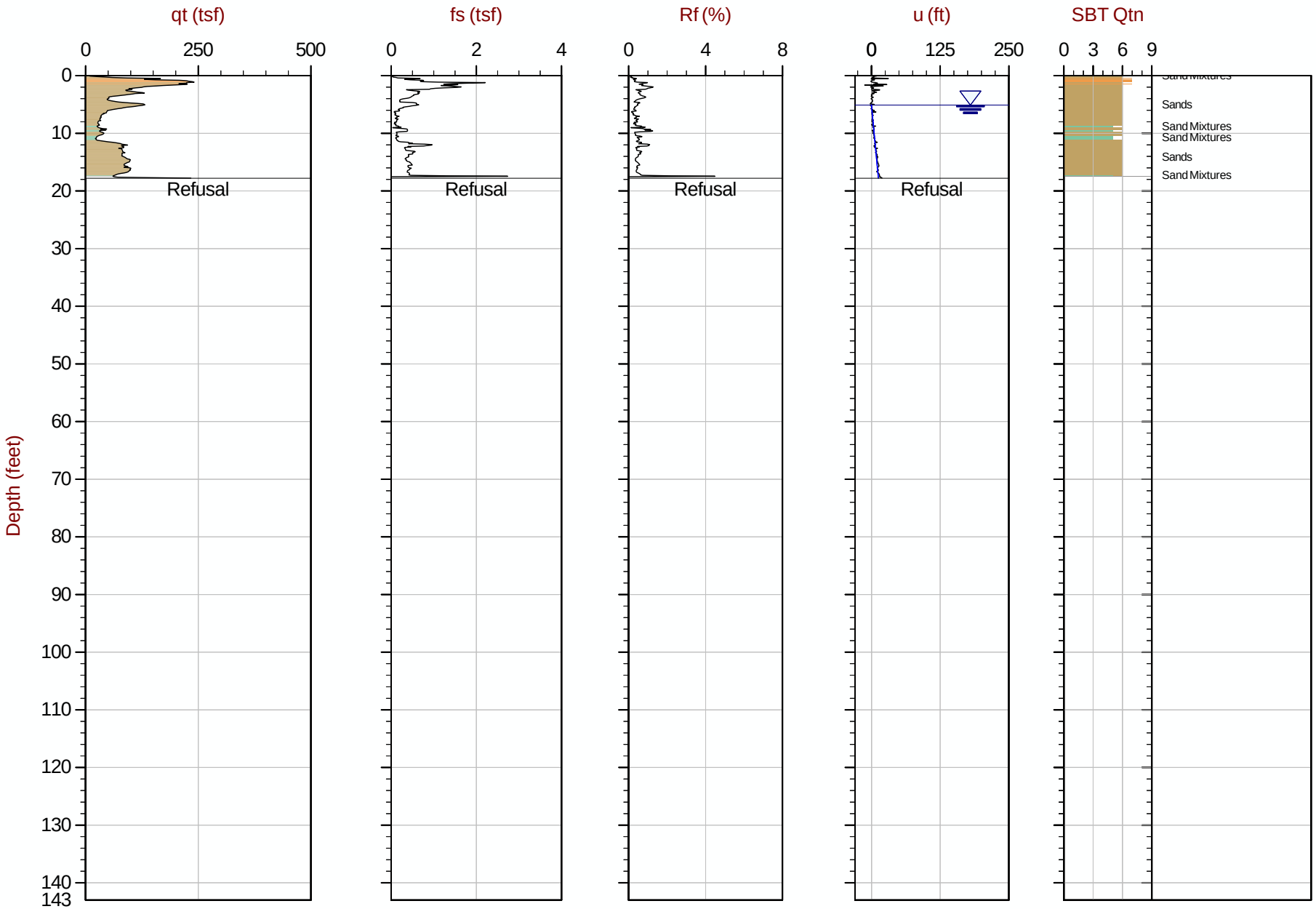
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 09:37
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-11
Cone: 550:T1500F15U500



Max Depth: 5.425 m / 17.80 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP11.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833184m E: 398275m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

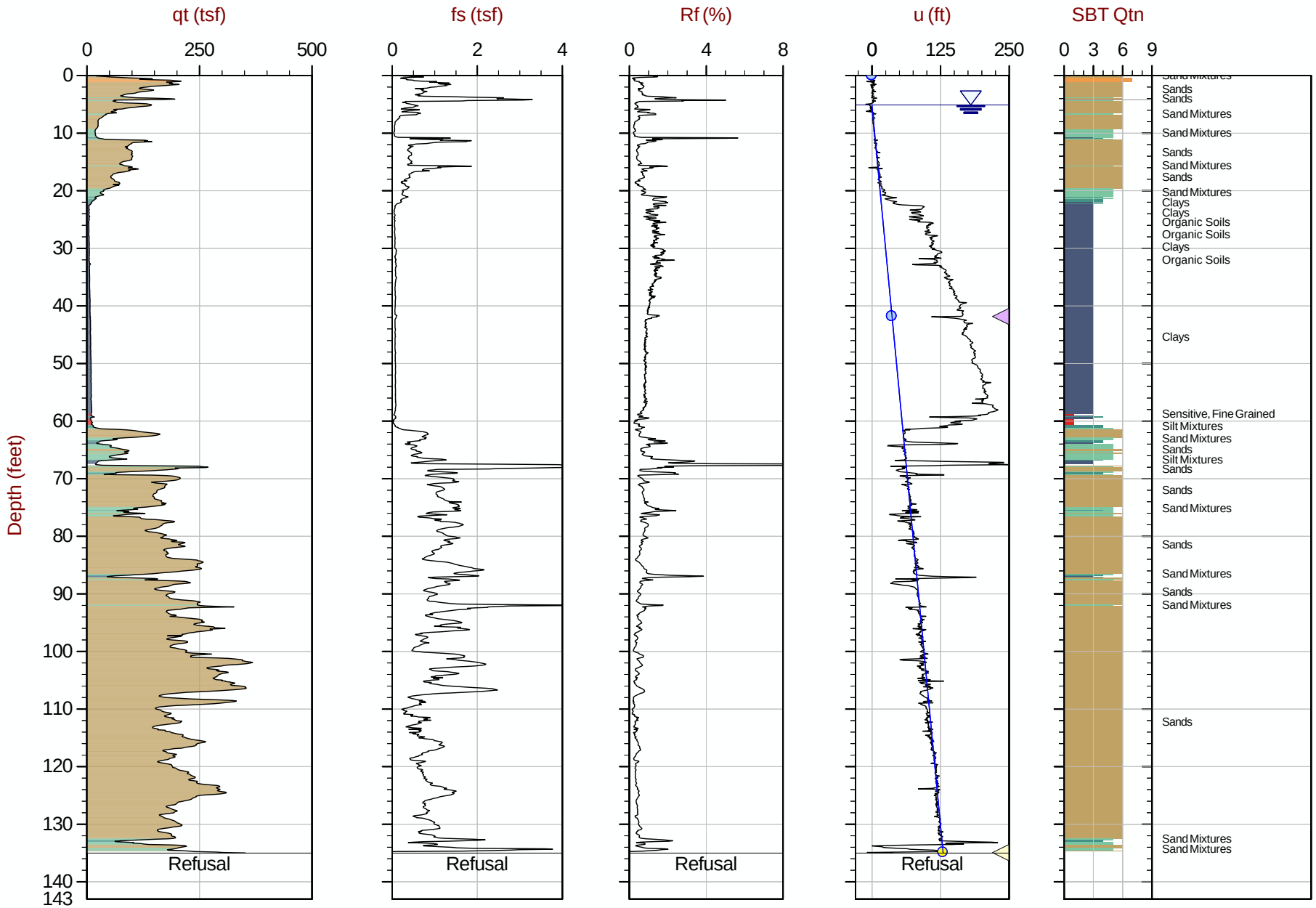
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 10:12
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-11A
Cone: 550:T1500F15U500



Max Depth: 41.150 m / 135.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP11A.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833176m E: 398269m

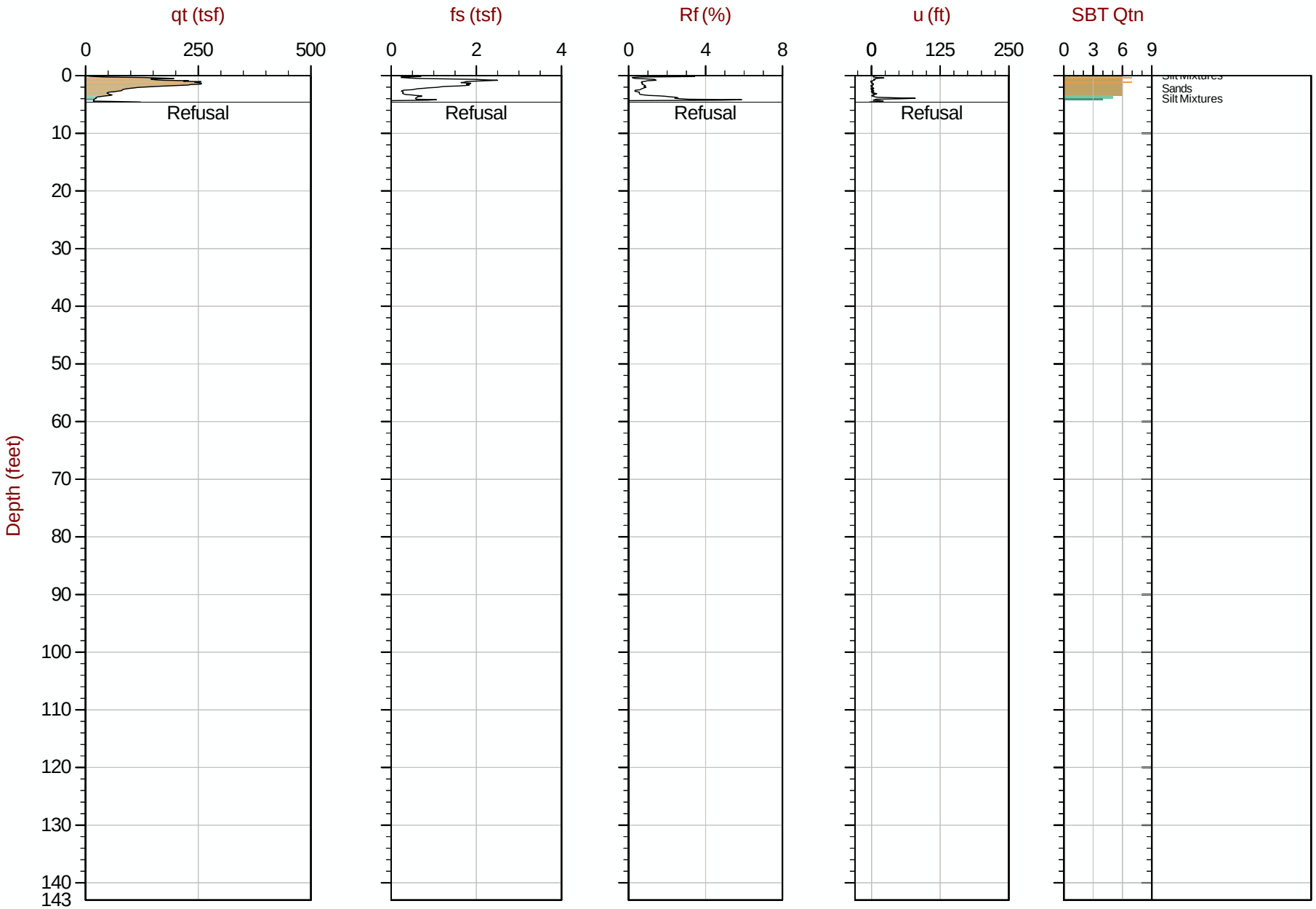
Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 08:04
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12
Cone: 550:T1500F15U500



Max Depth: 1.400 m / 4.59 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833126m E: 398203m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

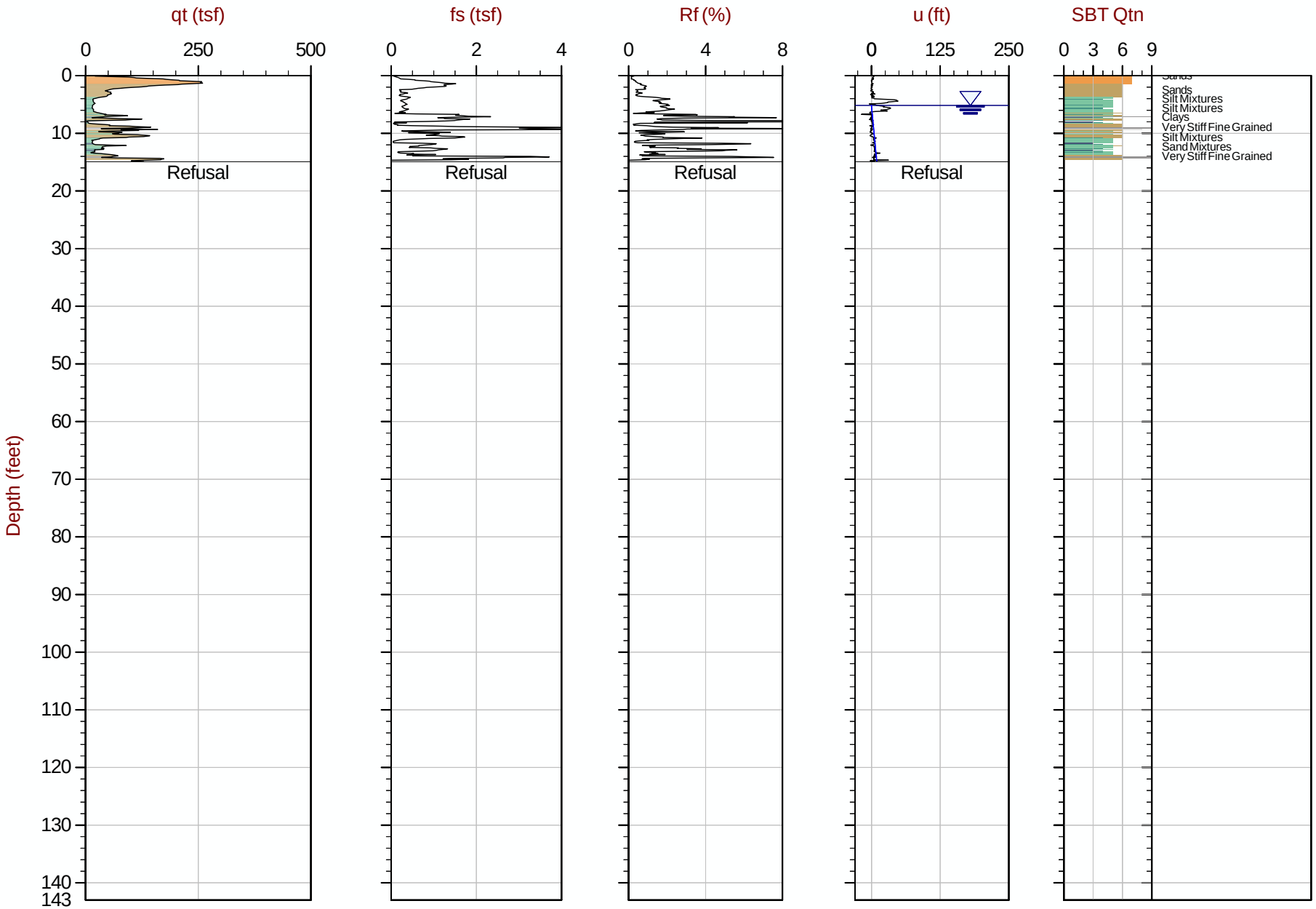
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 08:23
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12A
Cone: 550:T1500F15U500



Max Depth: 4.550 m / 14.93 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12A.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833123m E: 398208m

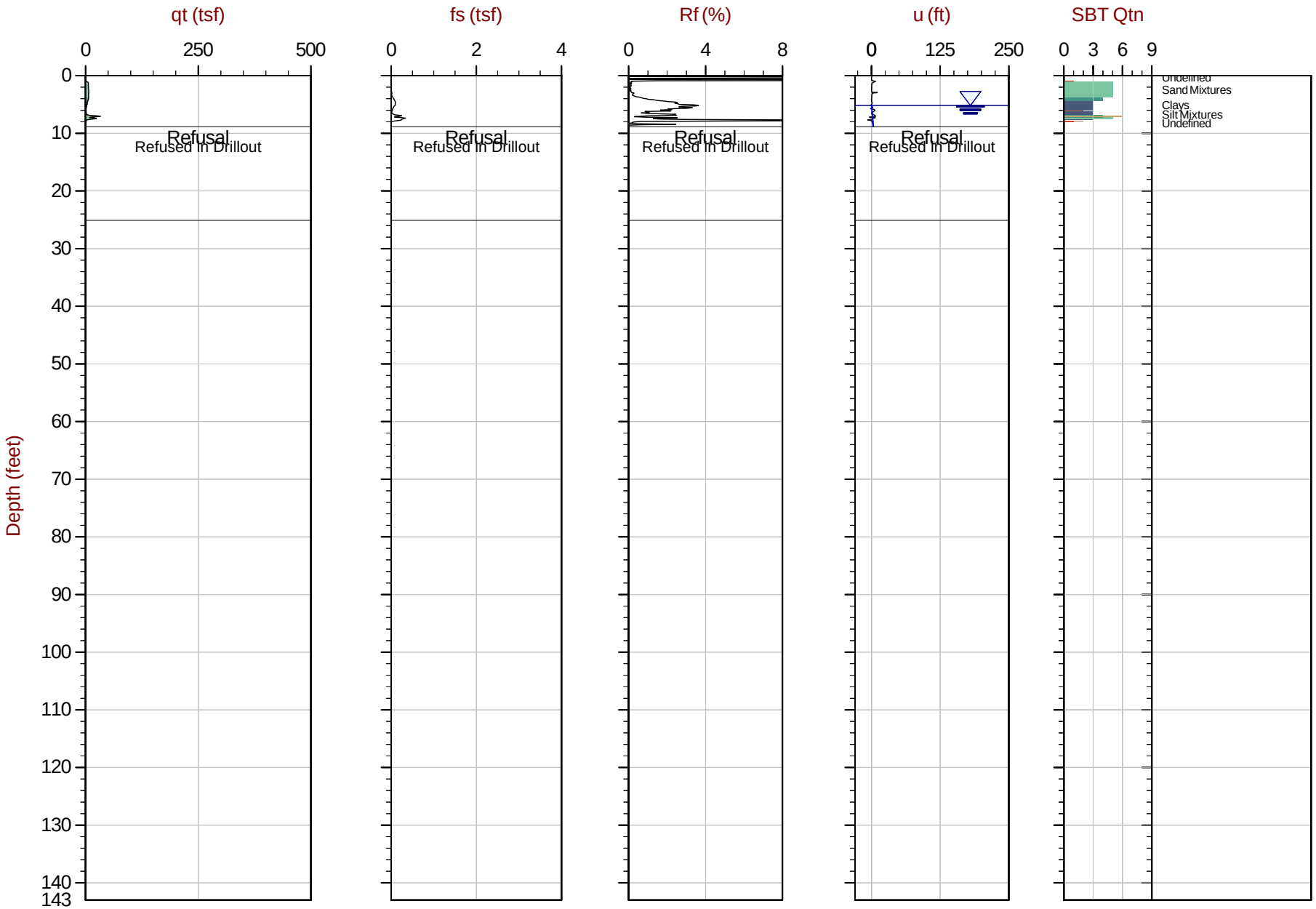
Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 08:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12B
Cone: 550:T1500F15U500



Max Depth: 2.700 m / 8.86 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12B.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833125m E: 398209m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

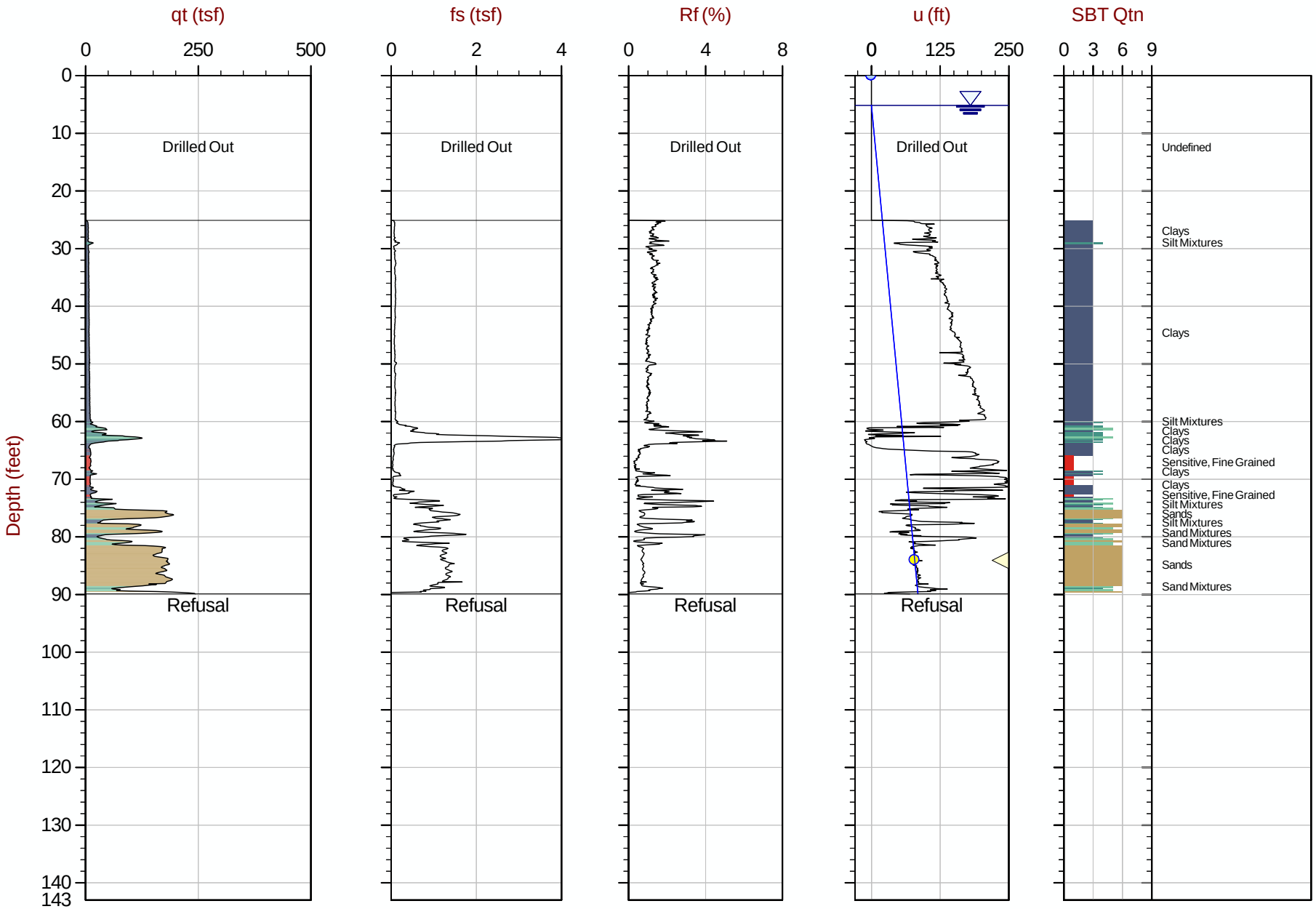
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 08:30
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12C
Cone: 550:T1500F15U500



Max Depth: 27.400 m / 89.89 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12C.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833125m E: 398209m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

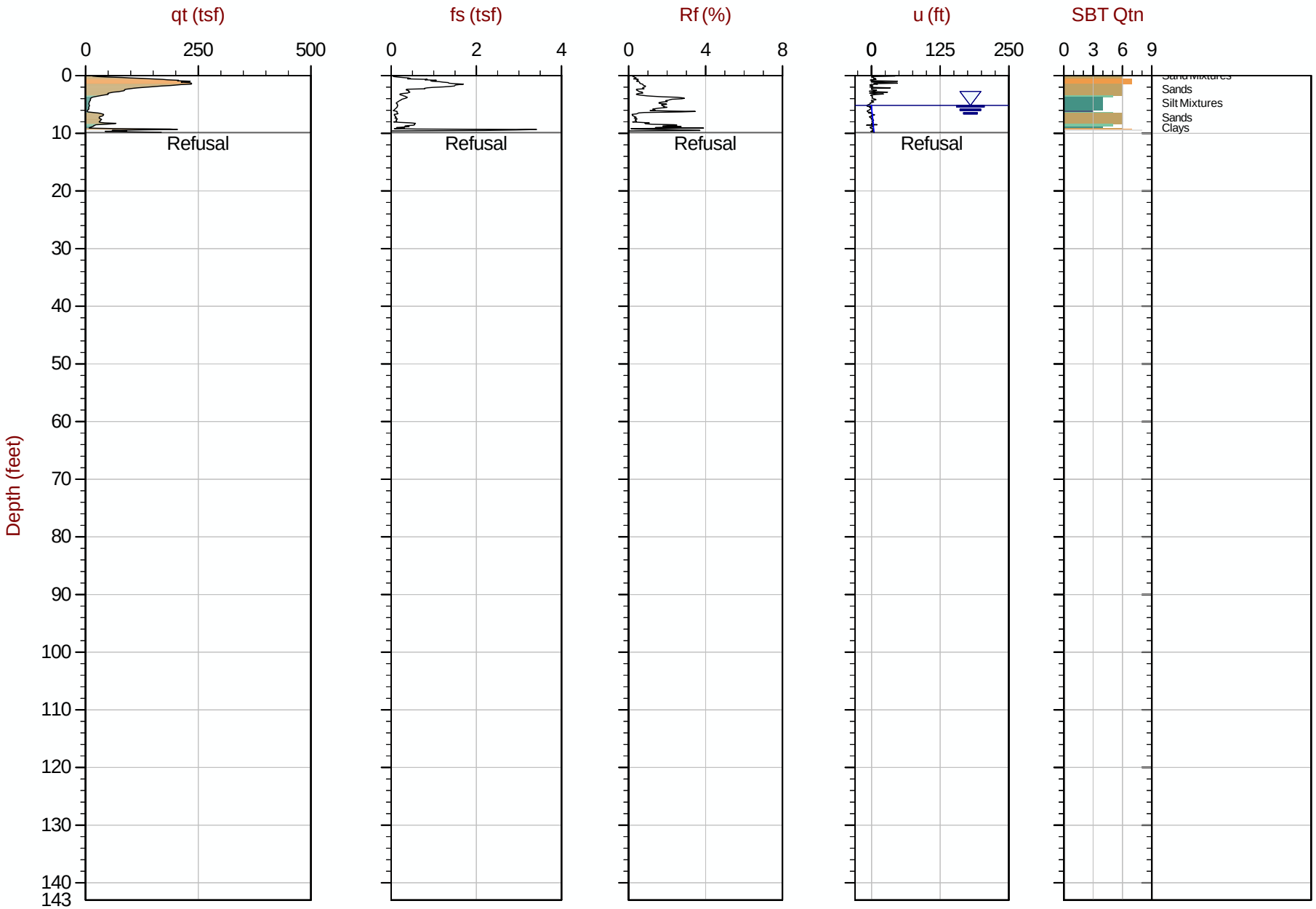
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 10:56
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12D
Cone: 550:T1500F15U500



Max Depth: 3.000 m / 9.84 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12D.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833121m E: 398204m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

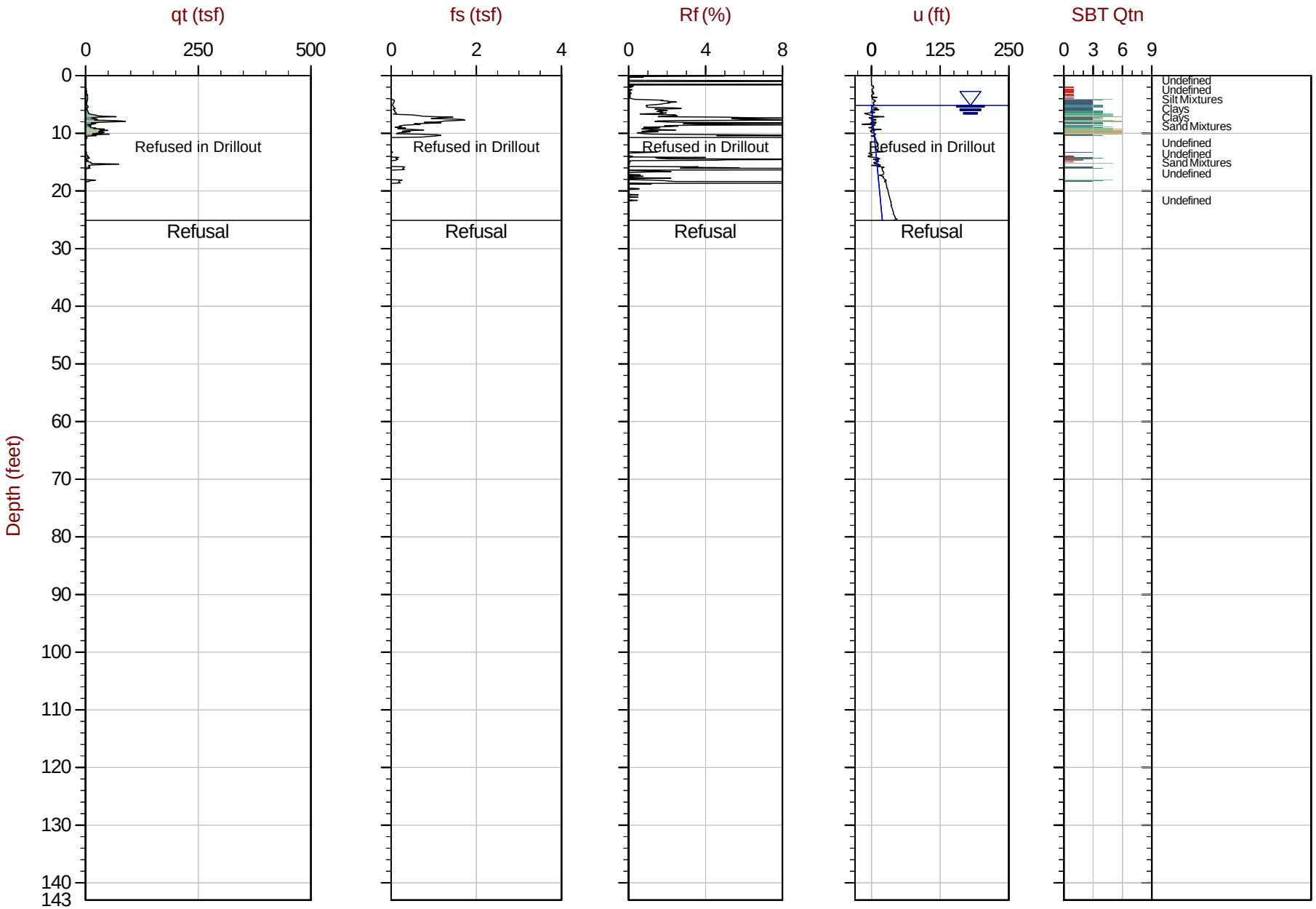
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 12:14
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12E
Cone: 550:T1500F15U500



Max Depth: 7.650 m / 25.10 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12E.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833121m E: 398207m

Hydrostatic Line ○ Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved

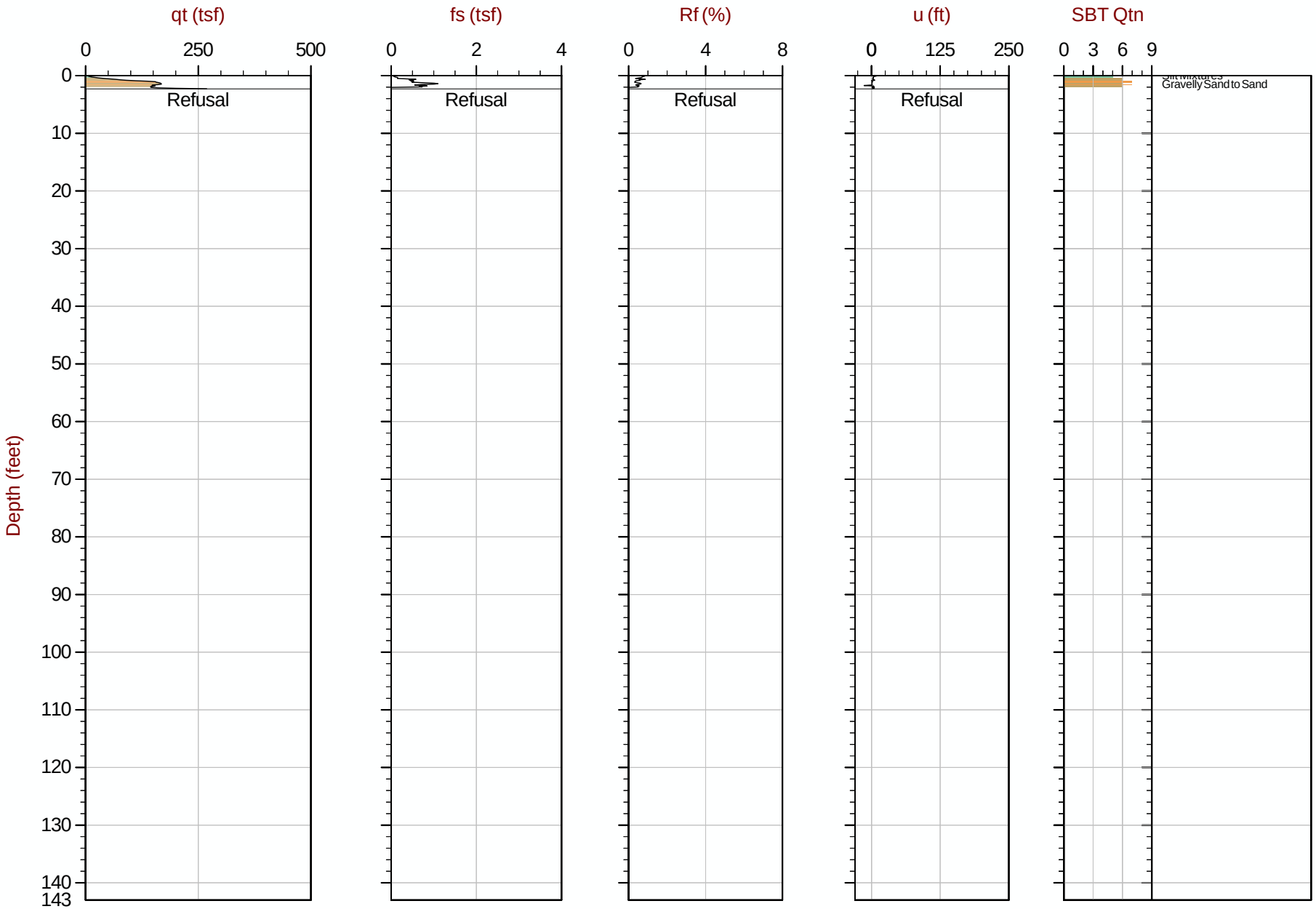
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 08:57
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14
Cone: 550:T1500F15U500



Max Depth: 0.700 m / 2.30 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP14.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833140m E: 398292m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

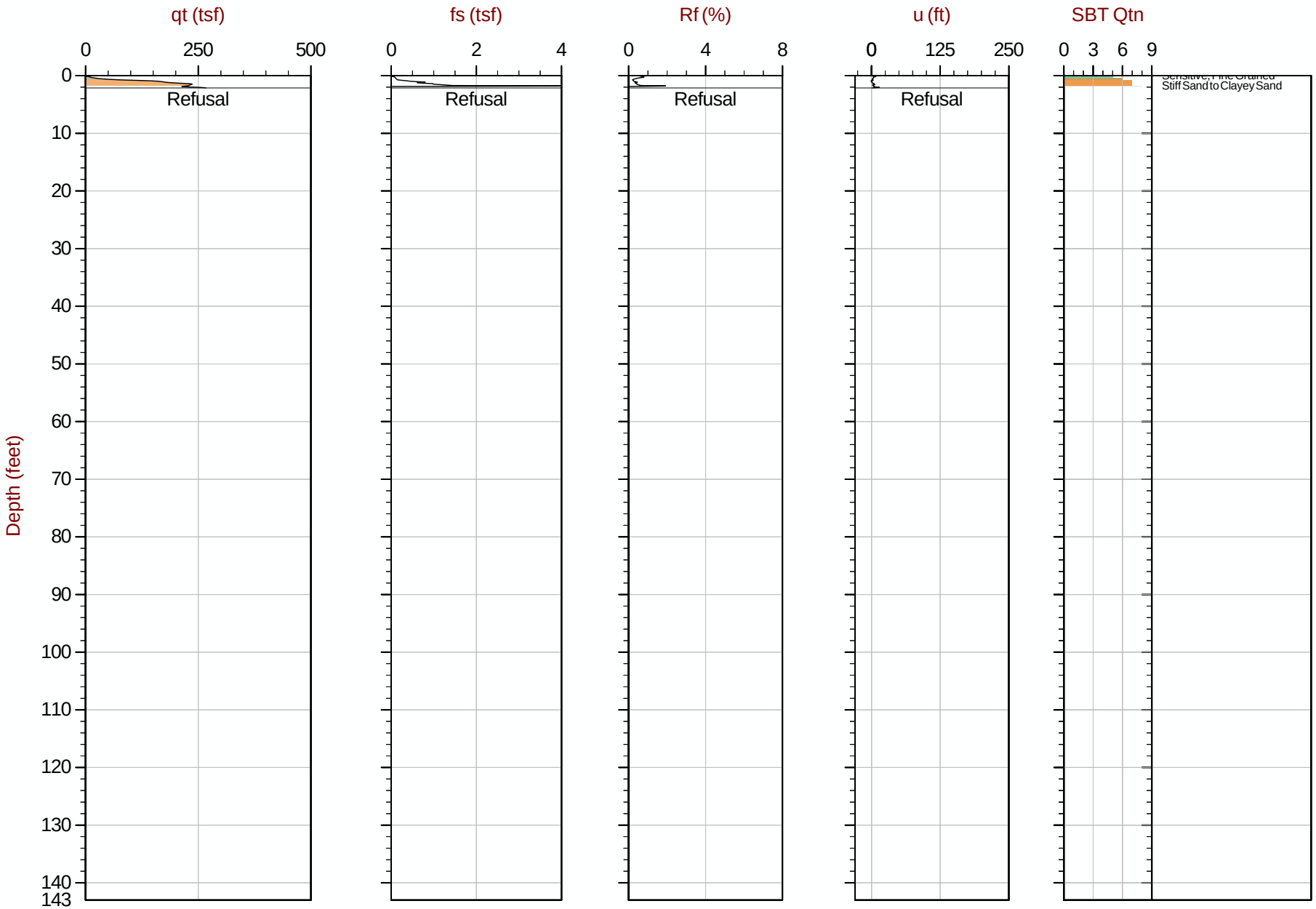
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 09:11
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14A
Cone: 550:T1500F15U500



Max Depth: 0.650 m / 2.13 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP14A.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833137m E: 398285m

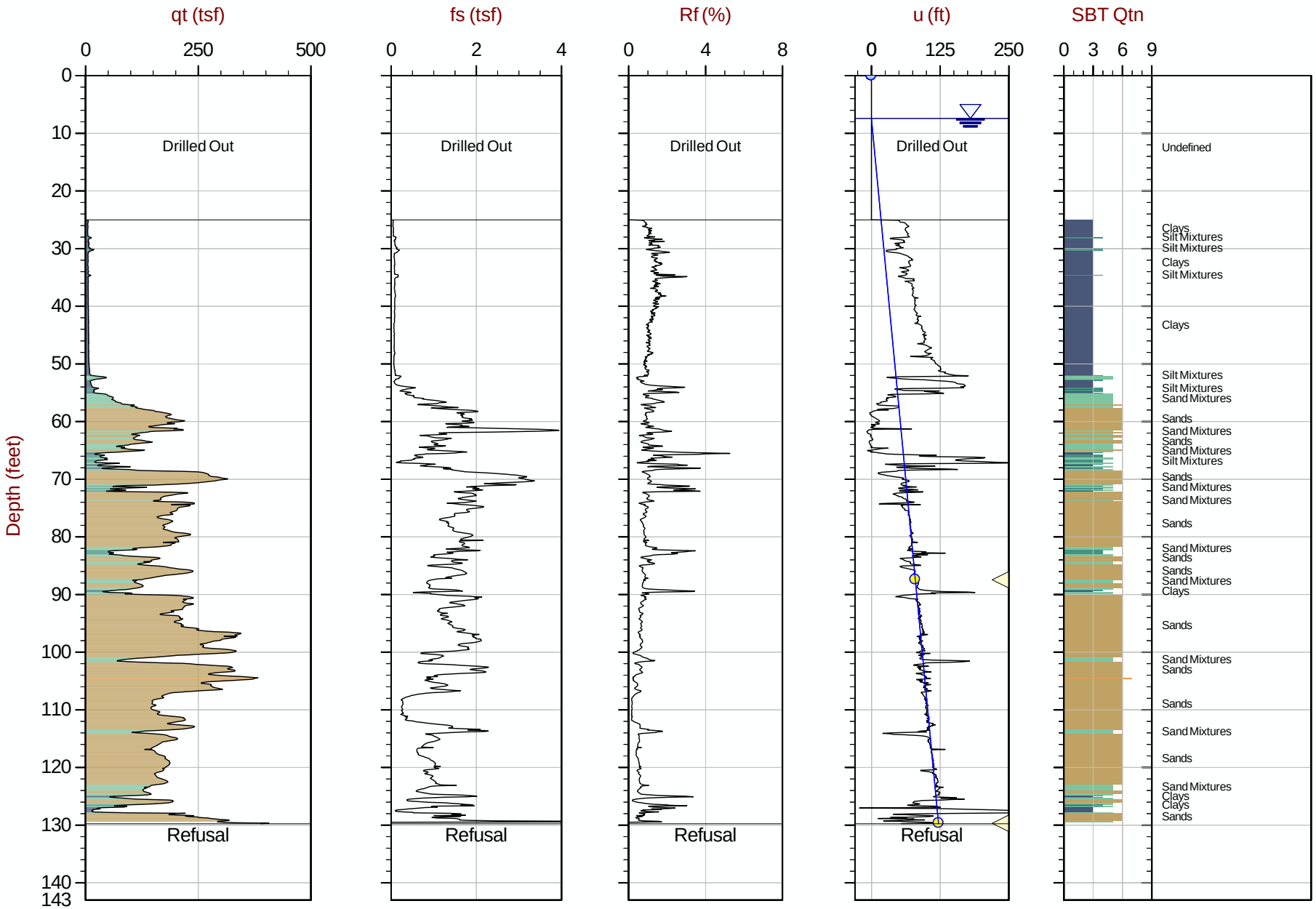
Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 04:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14B
Cone: 550:T1500F15U500



Max Depth: 39.550 m / 129.76 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP14B.COR

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833133m E: 398281m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

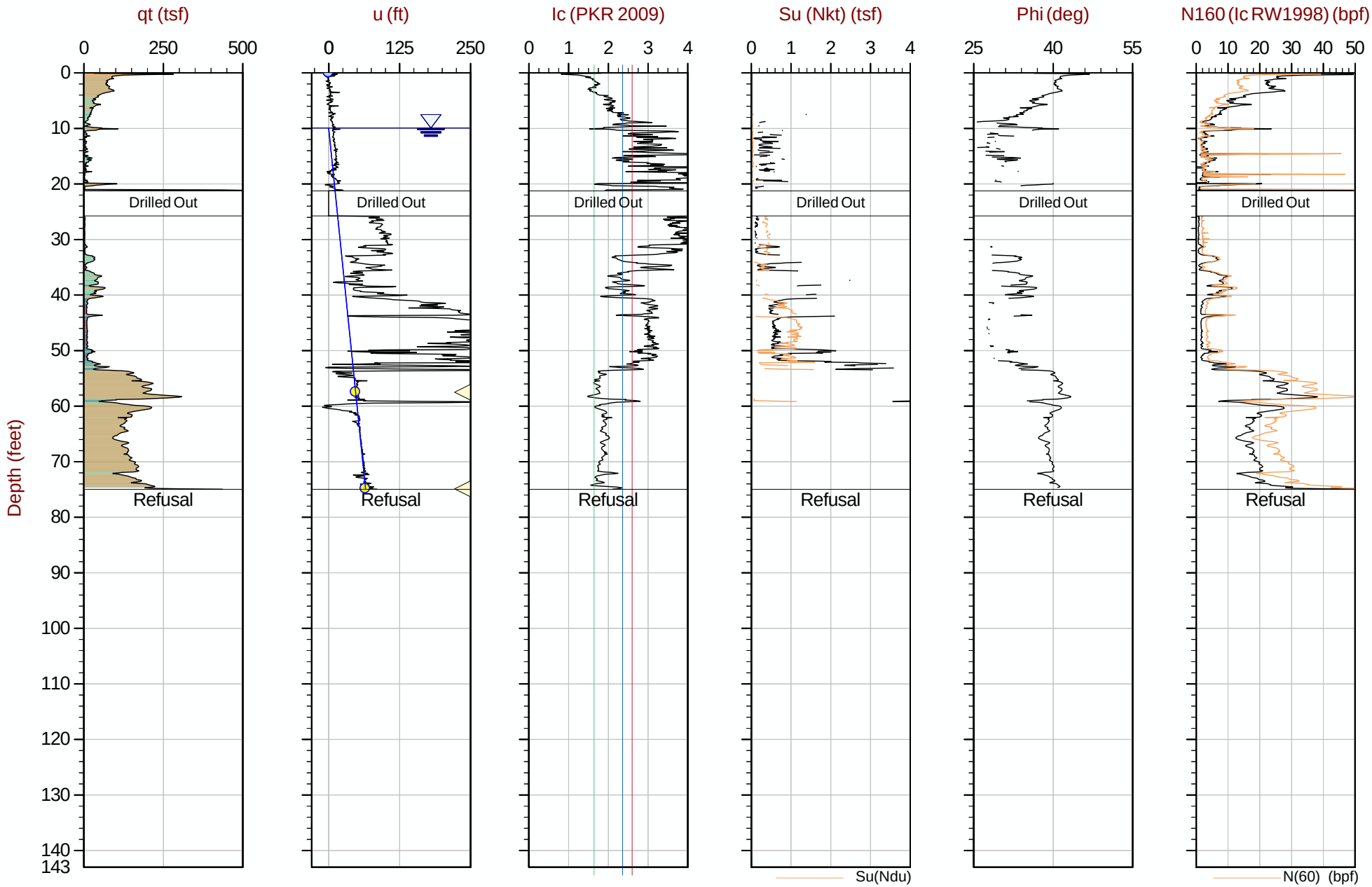
Advanced Cone Penetration Test Plots

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 23:26
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-02
Cone: 550:T1500F15U500



Max Depth: 22.850 m / 74.97 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP02.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833219m E: 398173m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

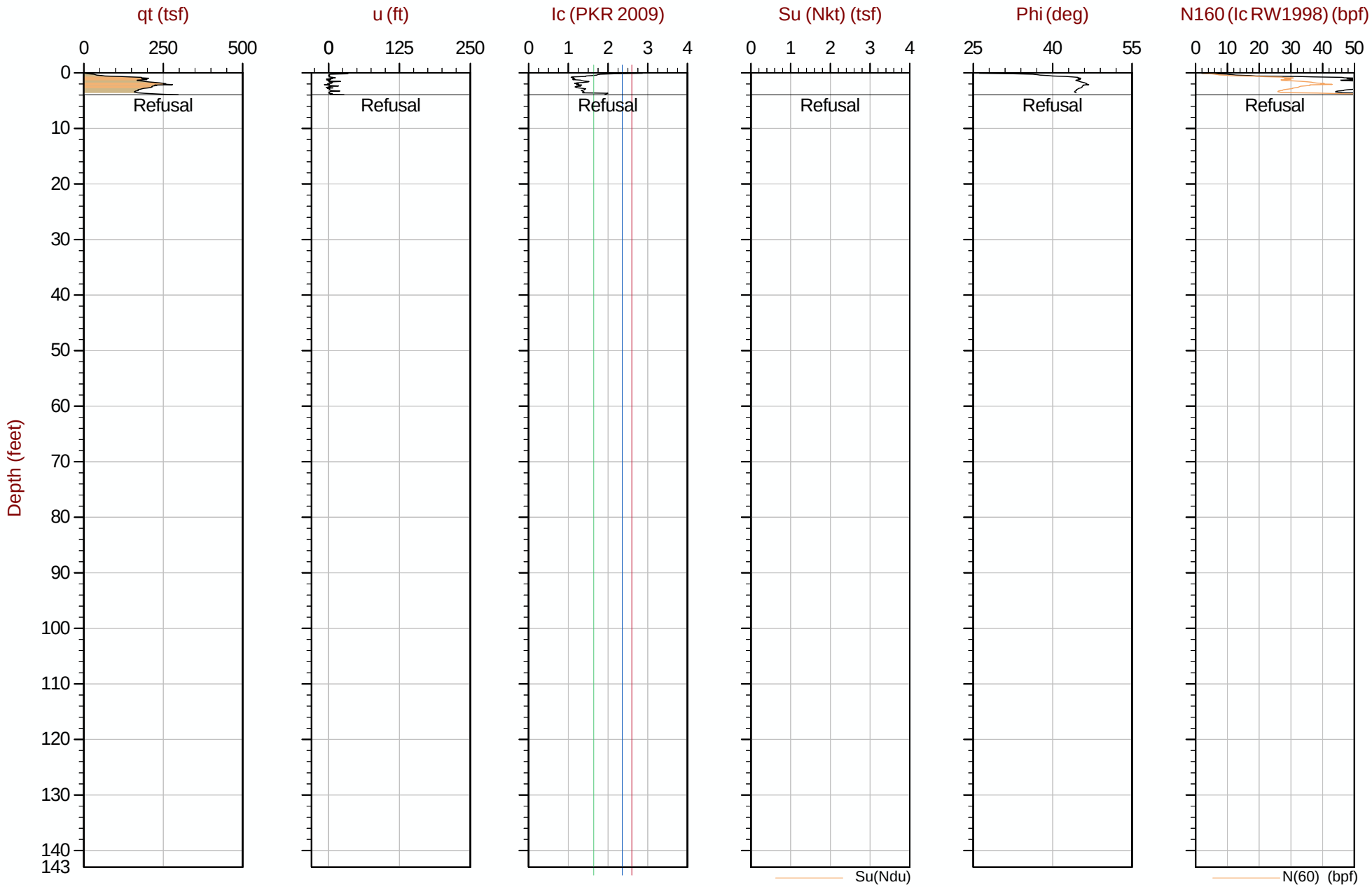
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 19:58
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-04
Cone: 550:T1500F15U500



Max Depth: 1.200 m / 3.94 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP04.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833244m E: 398243m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

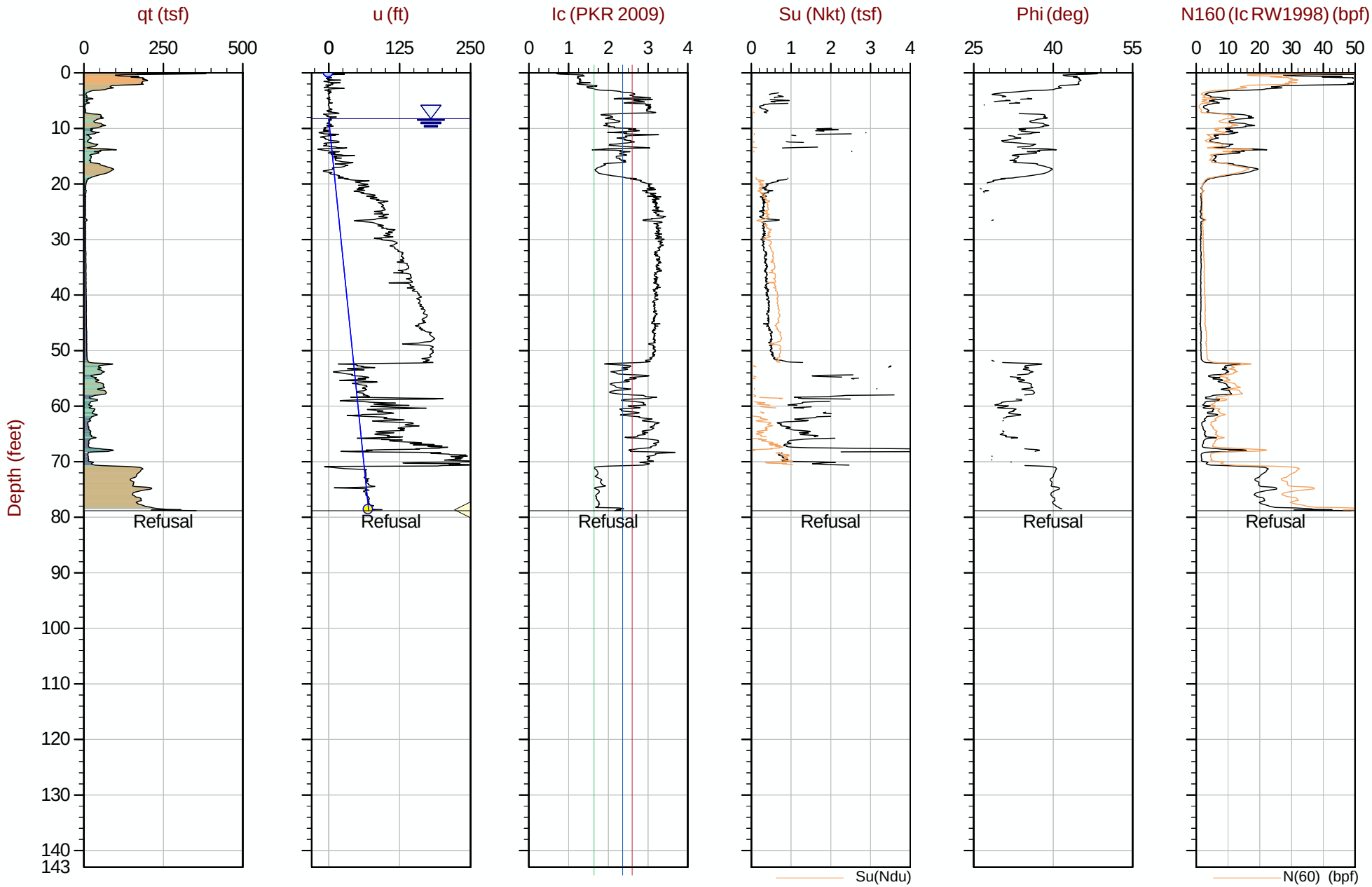
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 13:14
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-05
Cone: 550:T1500F15U500



Max Depth: 24.025 m / 78.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP05.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833191m E: 398170m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

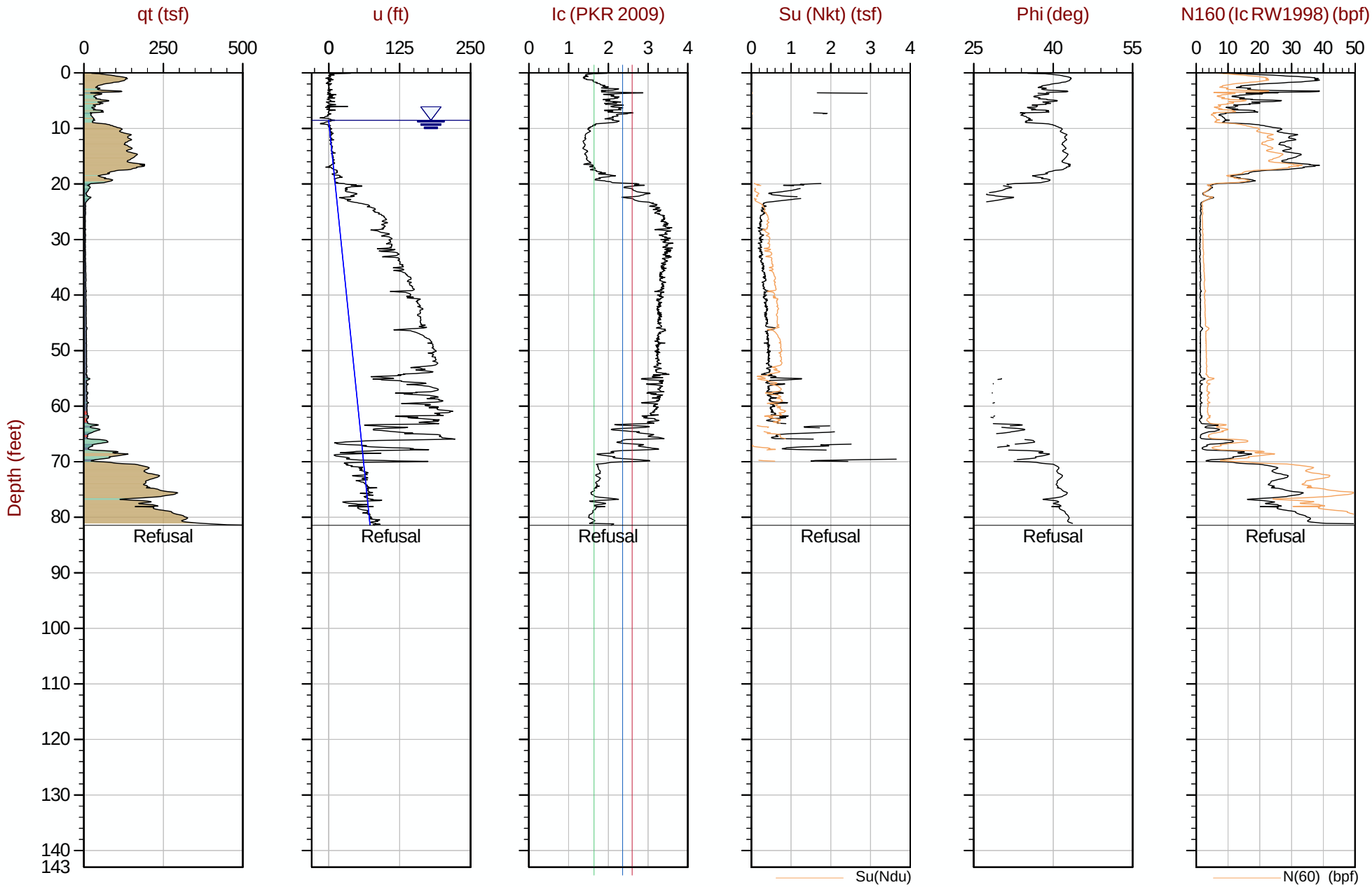
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-19 20:48
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-06
Cone: 550:T1500F15U500



Max Depth: 24.825 m / 81.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP06.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833201m E: 398222m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

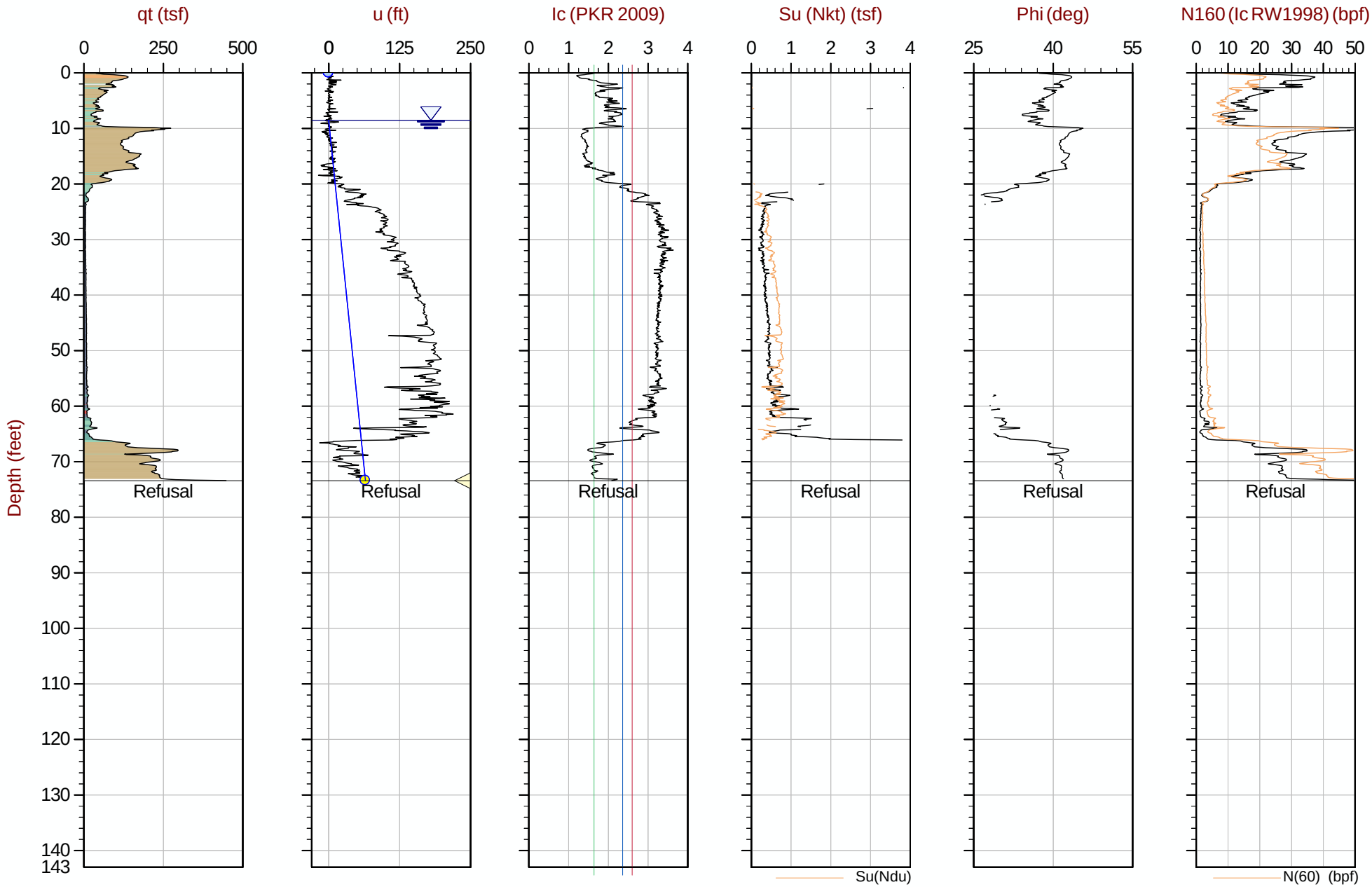
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 08:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-06A
Cone: 550:T1500F15U500



Max Depth: 22.375 m / 73.41 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP06A.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833203m E: 398217m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

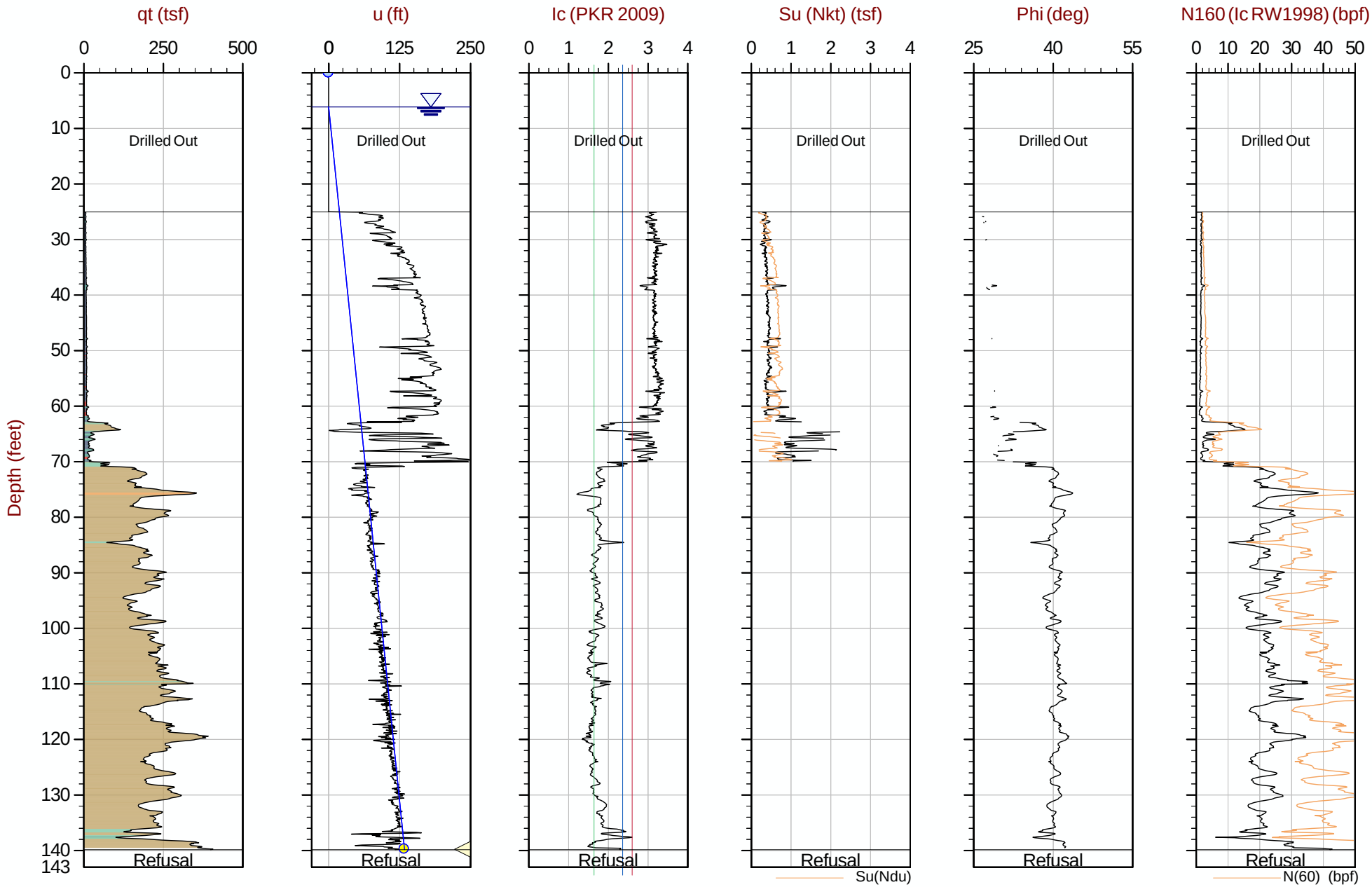
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 14:41
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-07
Cone: 550:T1500F15U500



Max Depth: 42.625 m / 139.84 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP07.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833210m E: 398261m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

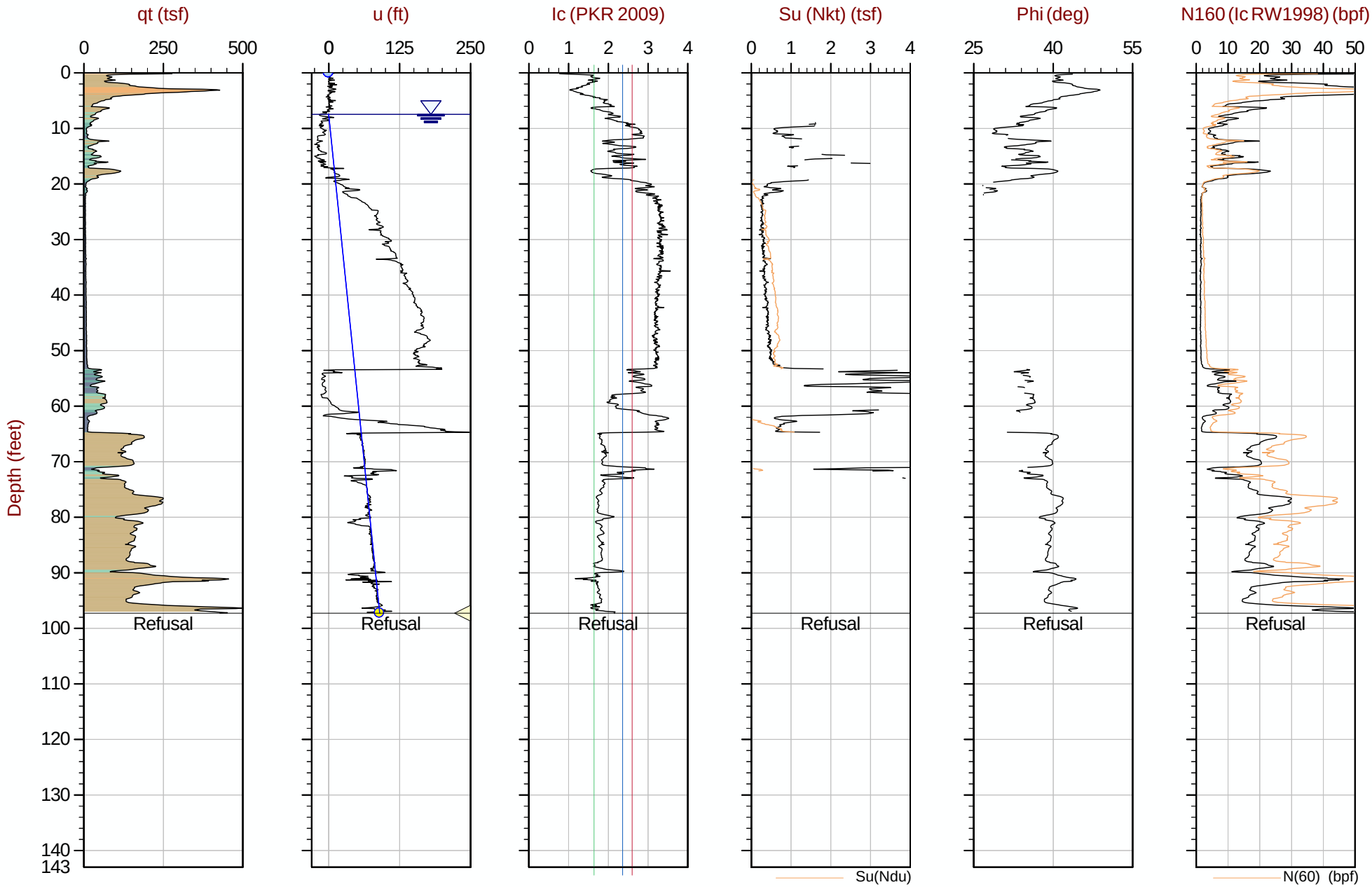
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-21 14:51
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-08
Cone: 550:T1500F15U500



Max Depth: 29.650 m / 97.28 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP08.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833171m E: 398158m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

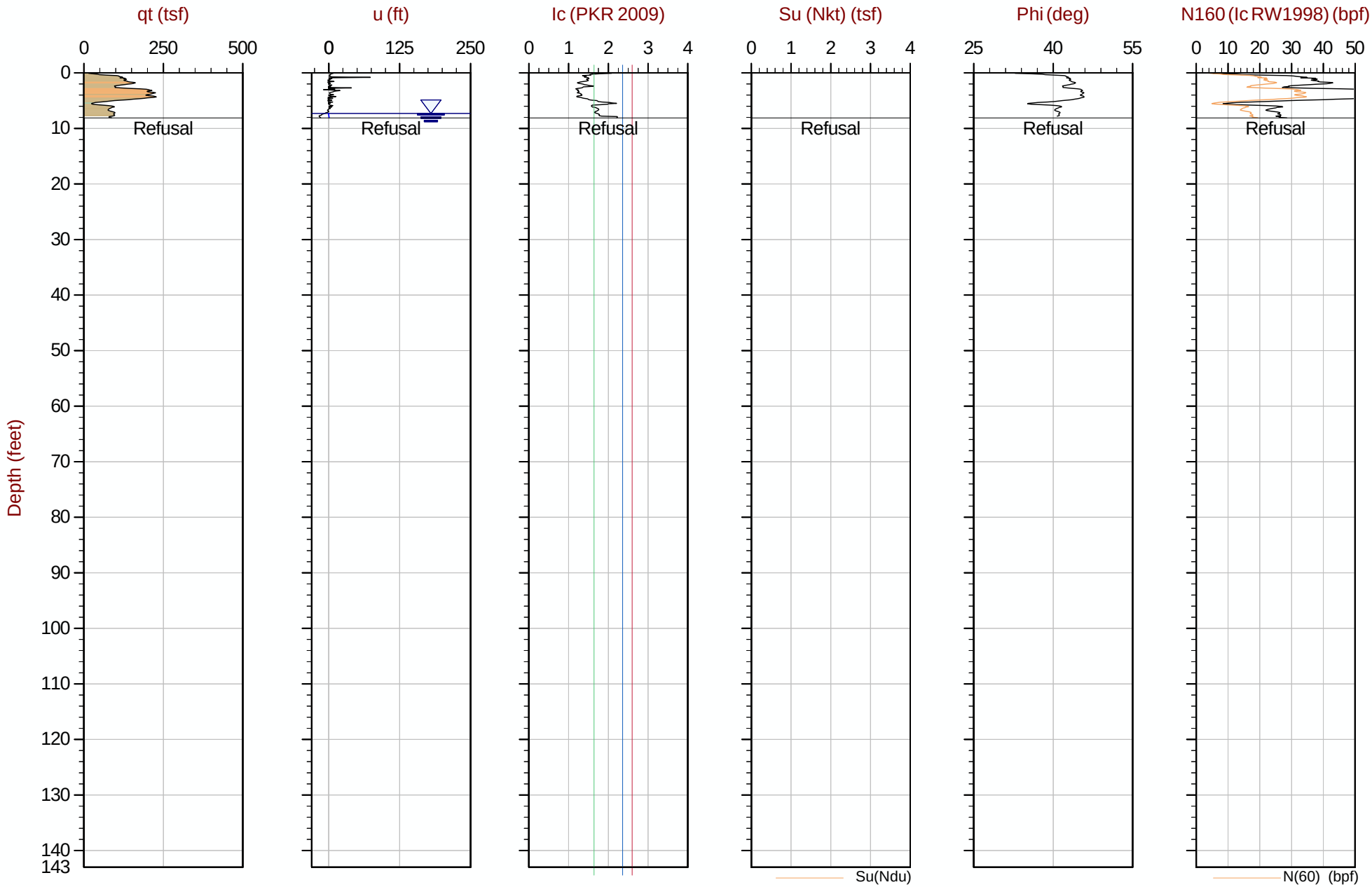
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 13:58
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-09
Cone: 550:T1500F15U500



Max Depth: 2.475 m / 8.12 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP09.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833163m E: 398187m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

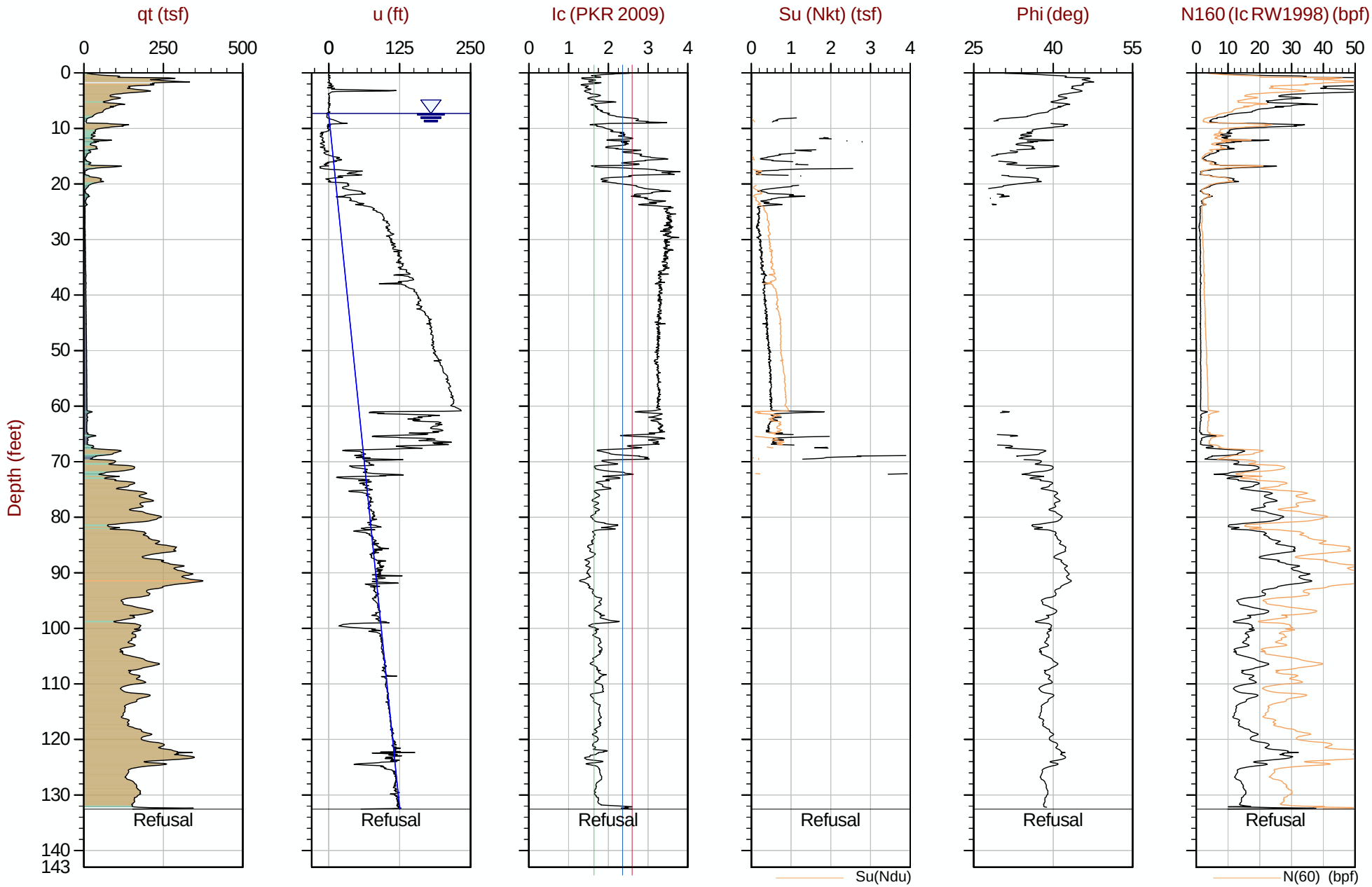
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 14:11
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-09A
Cone: 550:T1500F15U500



Max Depth: 40.400 m / 132.54 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP09A.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833162m E: 398190m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

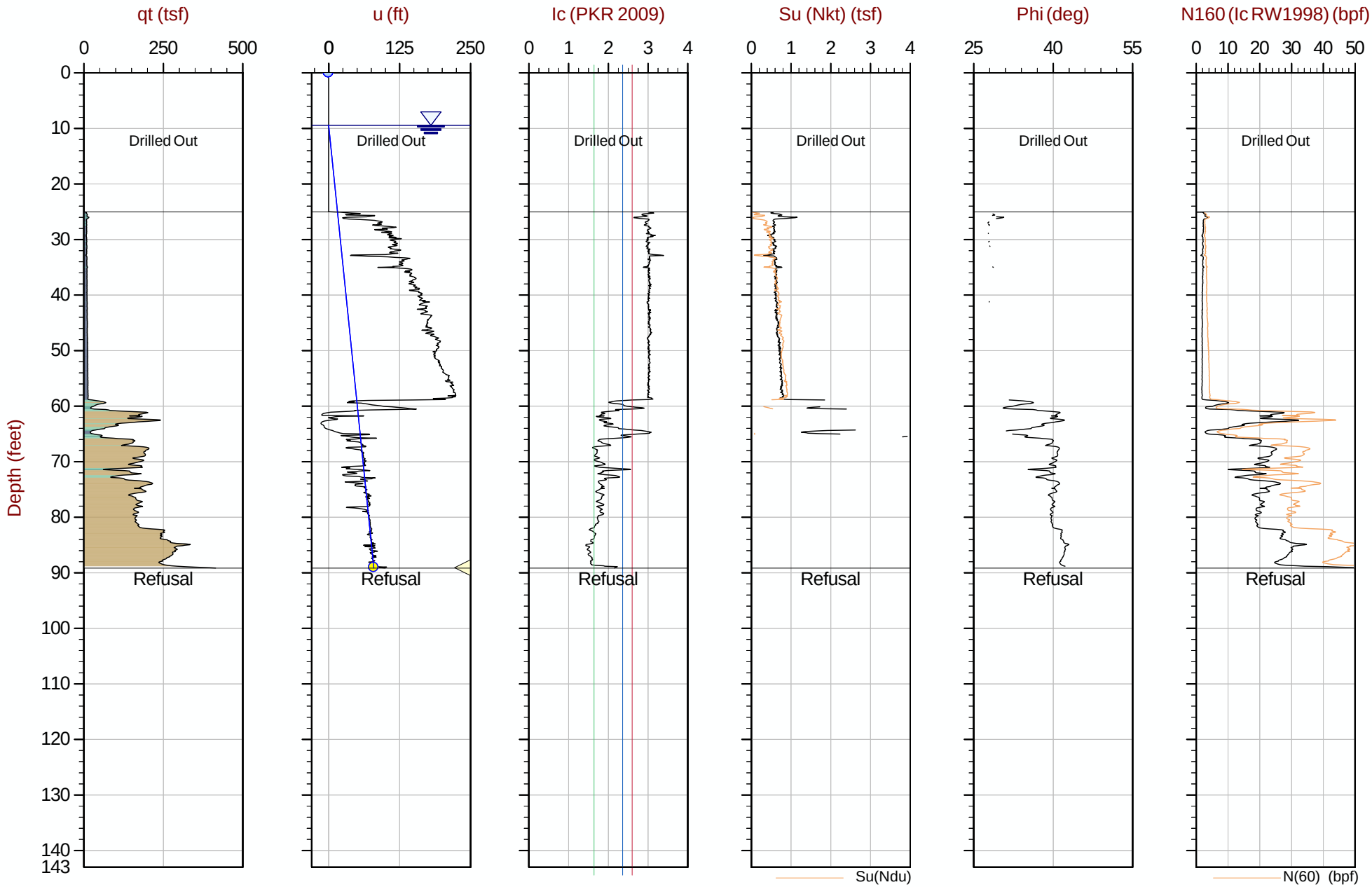
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 11:42
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-10
Cone: 550:T1500F15U500



Max Depth: 27.175 m / 89.16 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP10.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833181m E: 398234m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

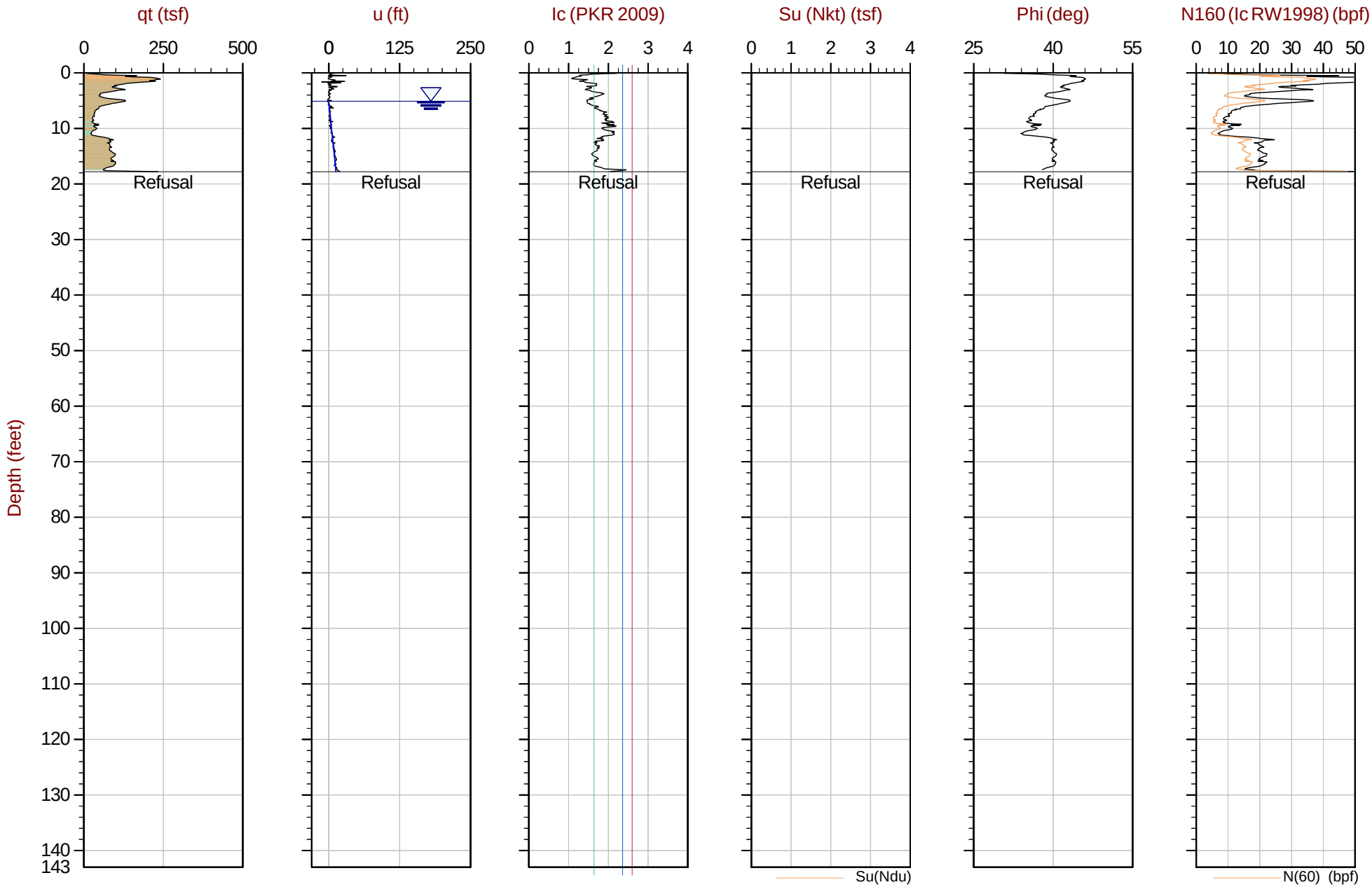
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 09:37
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-11
Cone: 550:T1500F15U500



Max Depth: 5.425 m / 17.80 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP11.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833184m E: 398275m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

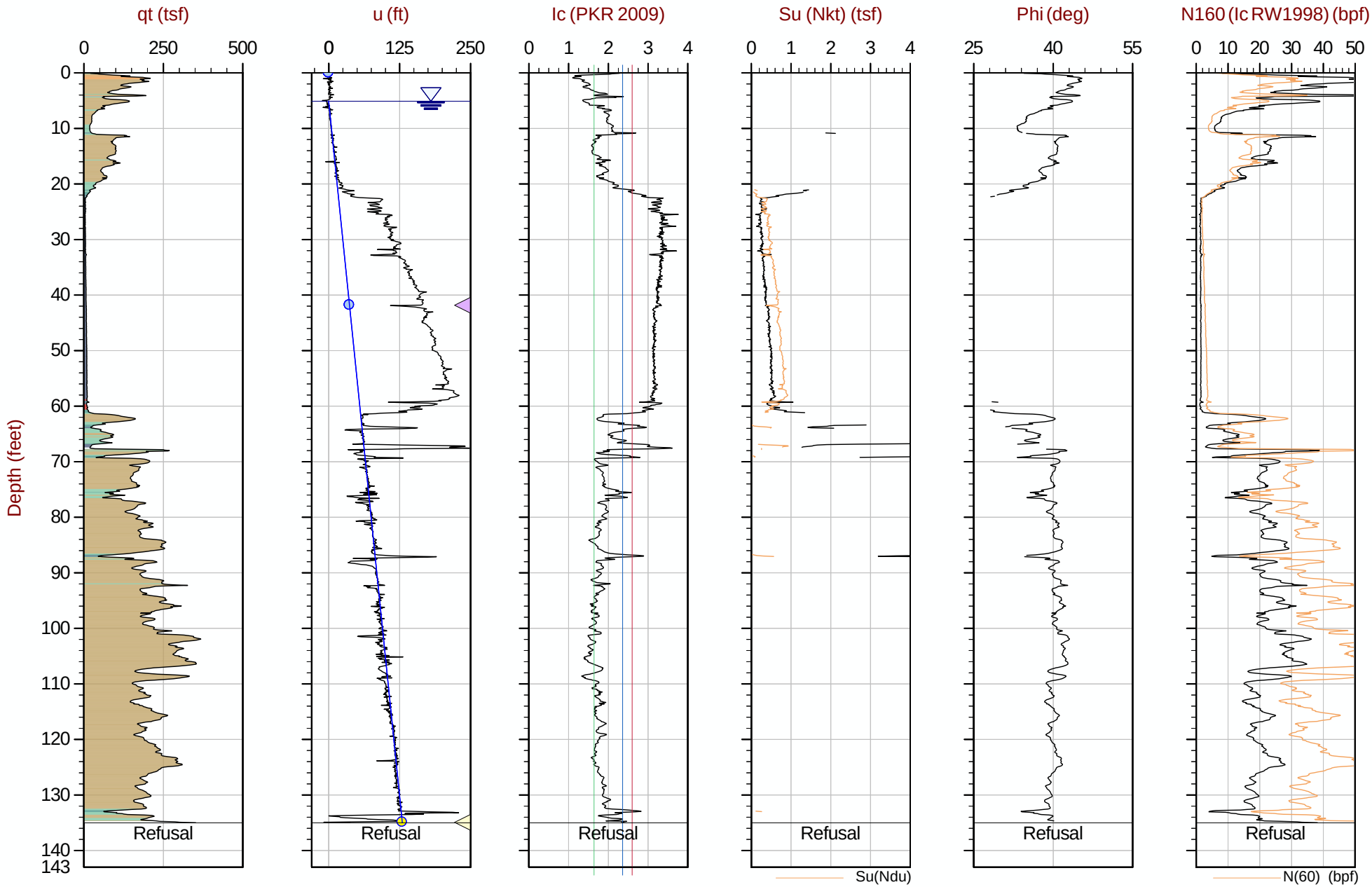
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 10:12
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-11A
Cone: 550:T1500F15U500



Max Depth: 41.150 m / 135.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP11A.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833176m E: 398269m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

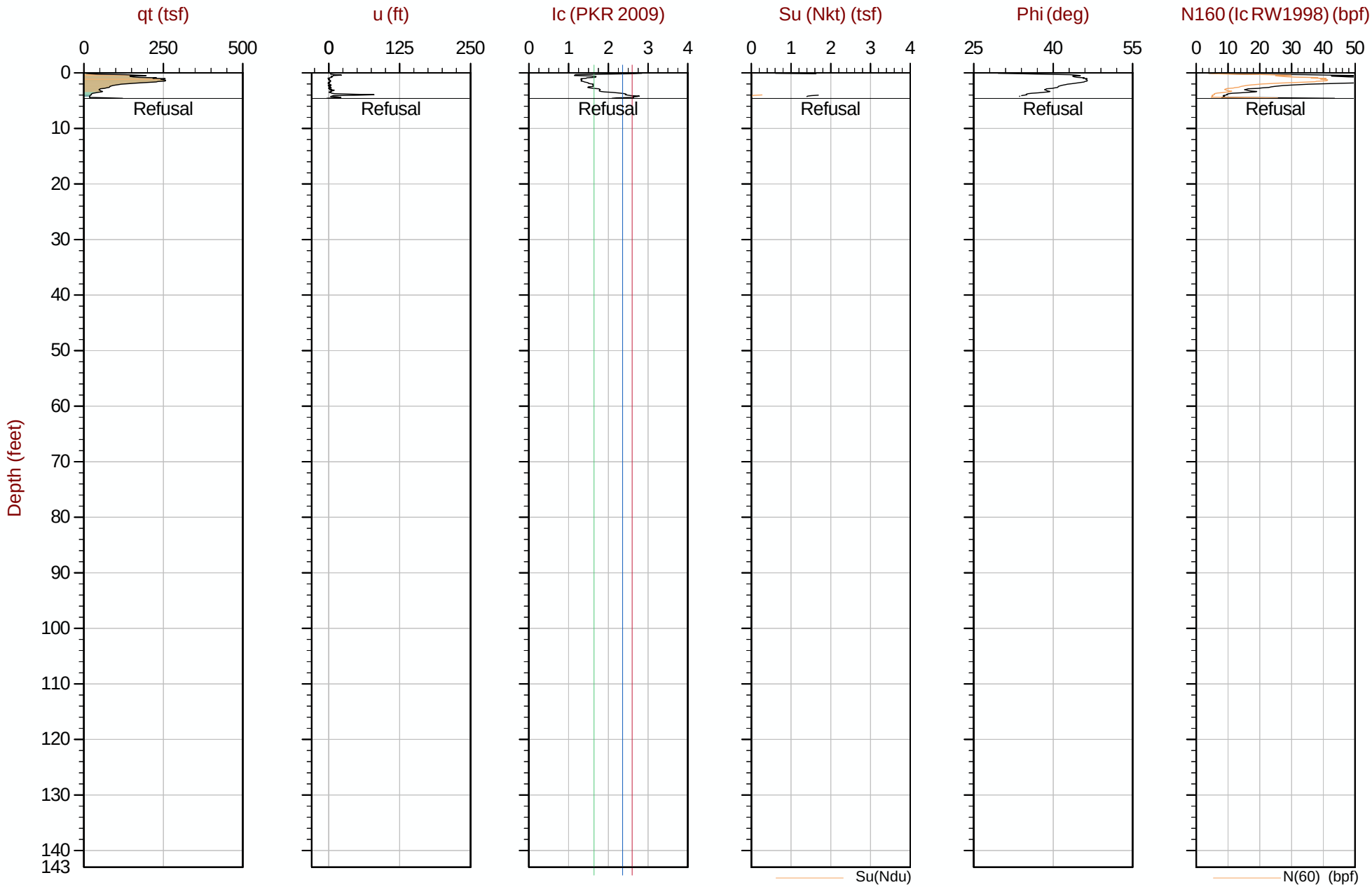
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 08:04
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12
Cone: 550:T1500F15U500



Max Depth: 1.400 m / 4.59 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833126m E: 398203m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

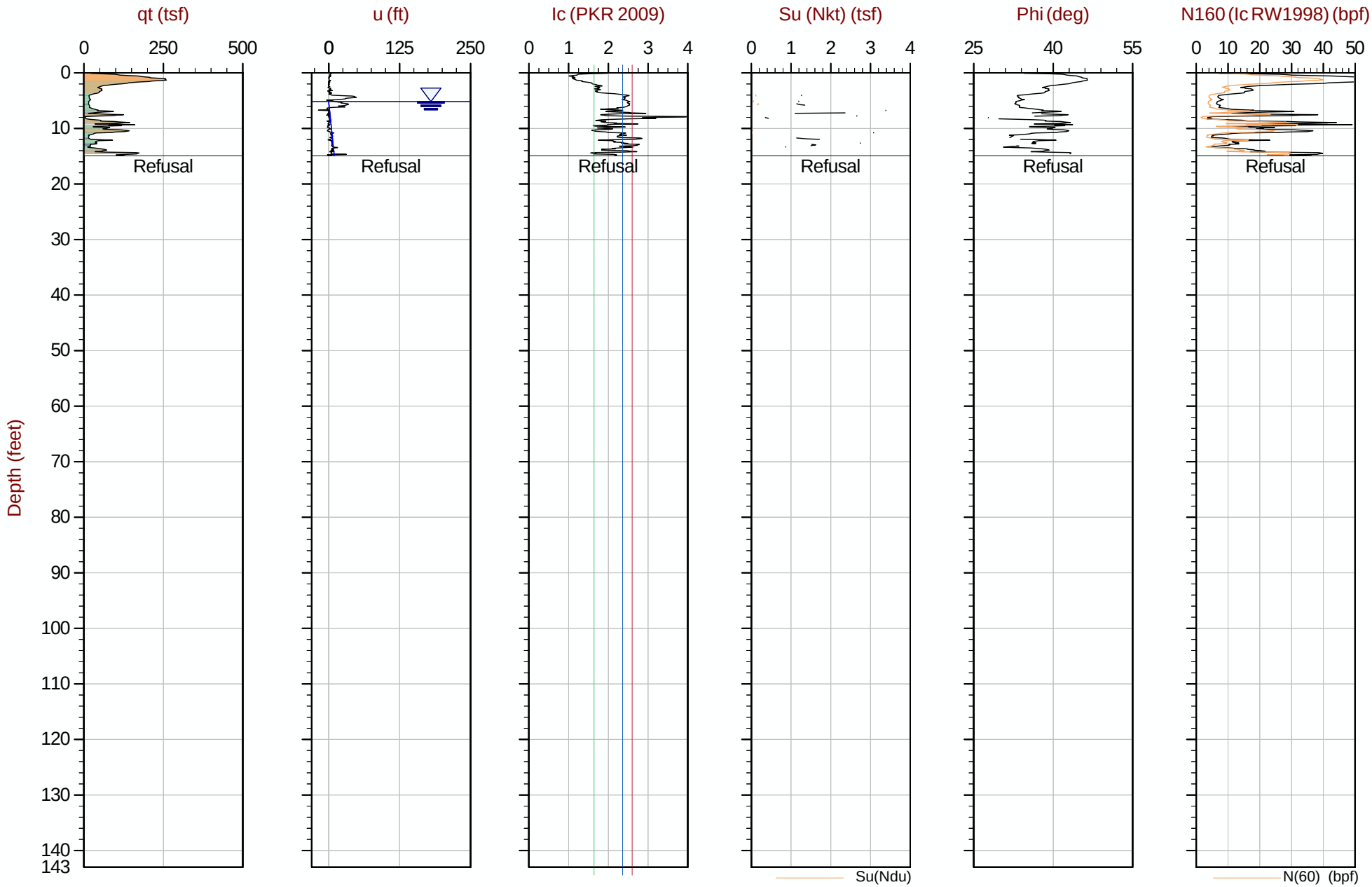
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 08:23
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12A
Cone: 550:T1500F15U500



Max Depth: 4.550 m / 14.93 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12A.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833123m E: 398208m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

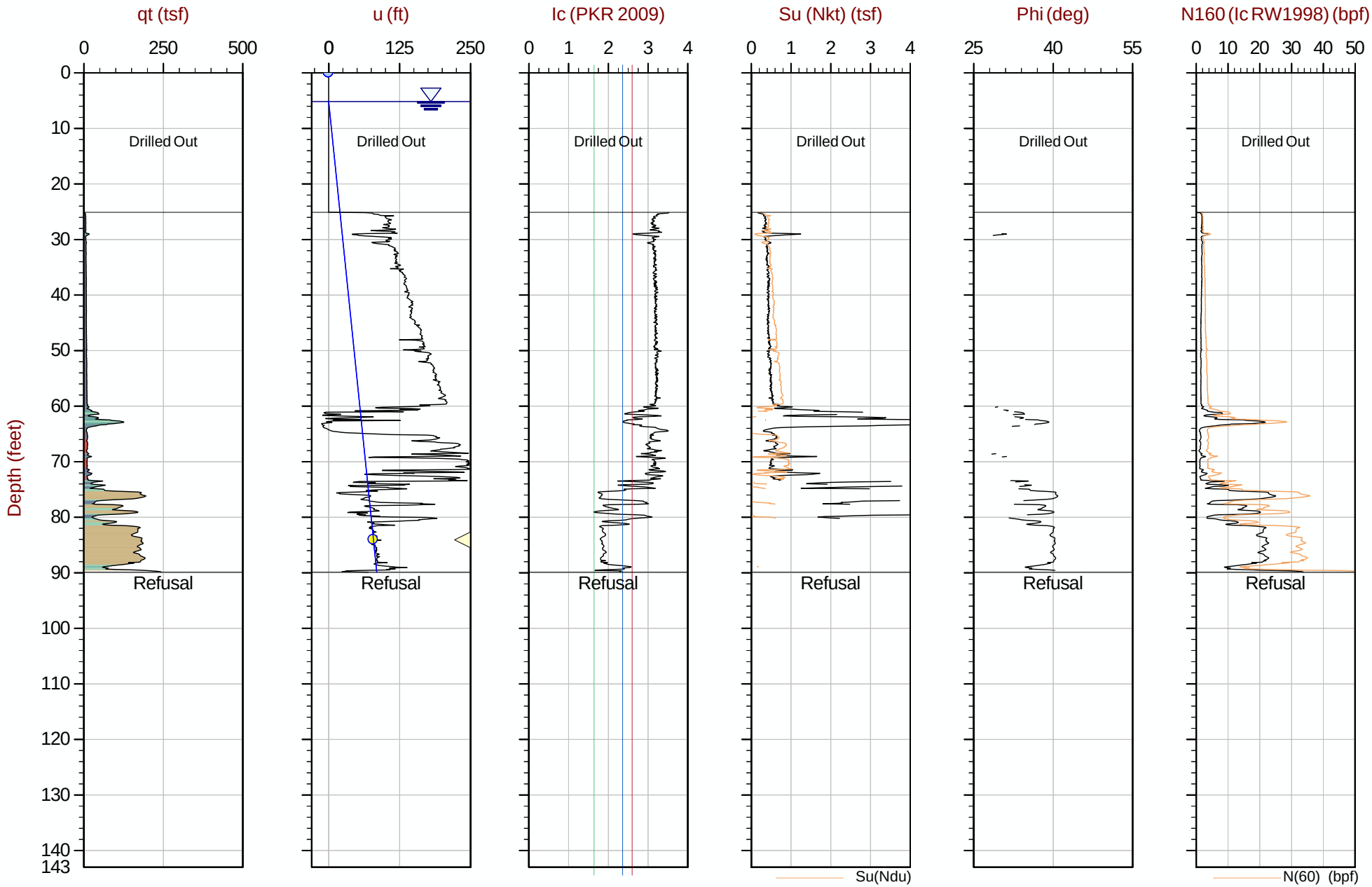
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 08:30
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12C
Cone: 550:T1500F15U500



Max Depth: 27.400 m / 89.89 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12C.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833125m E: 398209m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

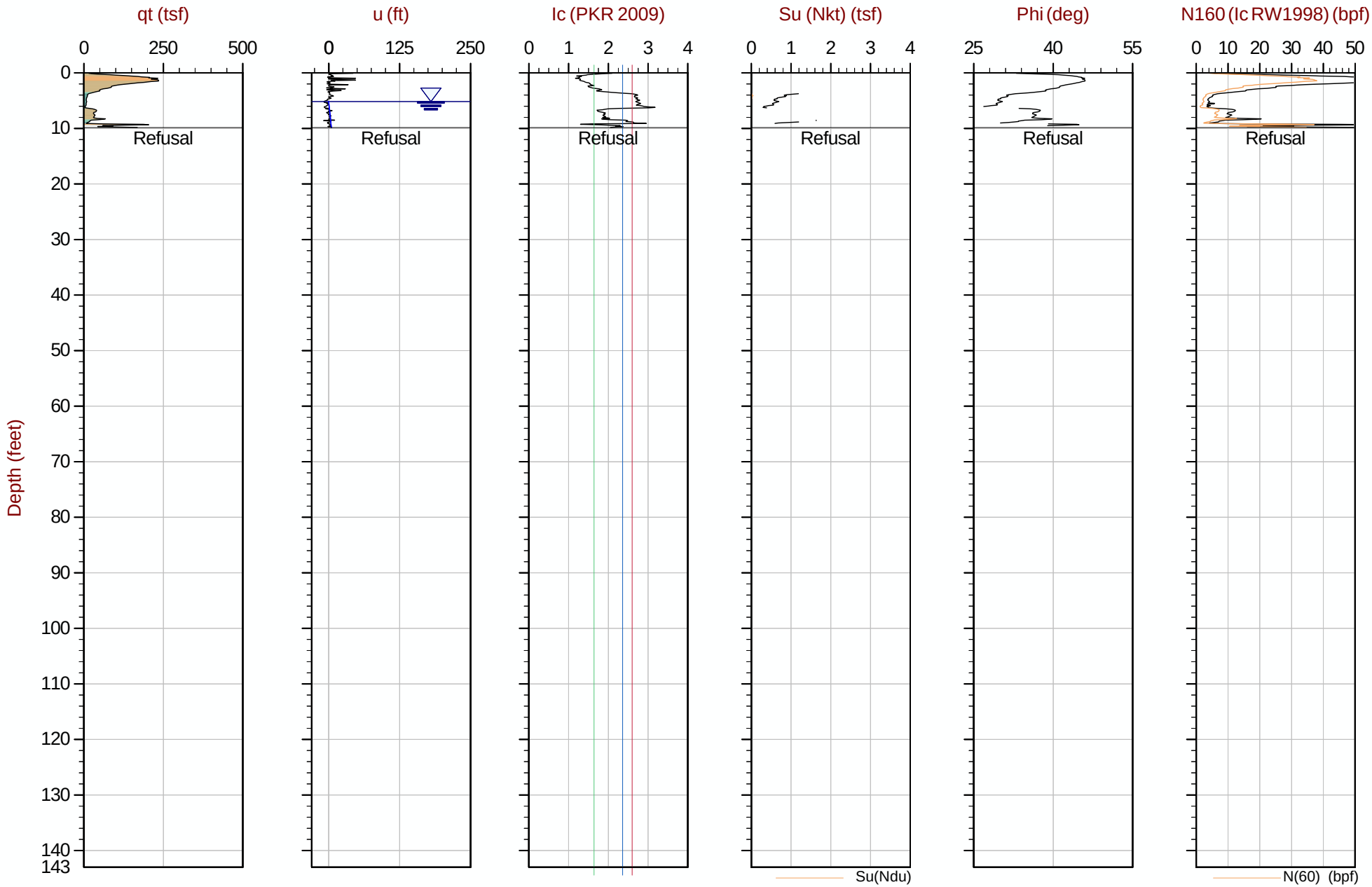
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 10:56
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12D
Cone: 550:T1500F15U500



Max Depth: 3.000 m / 9.84 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP12D.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833121m E: 398204m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

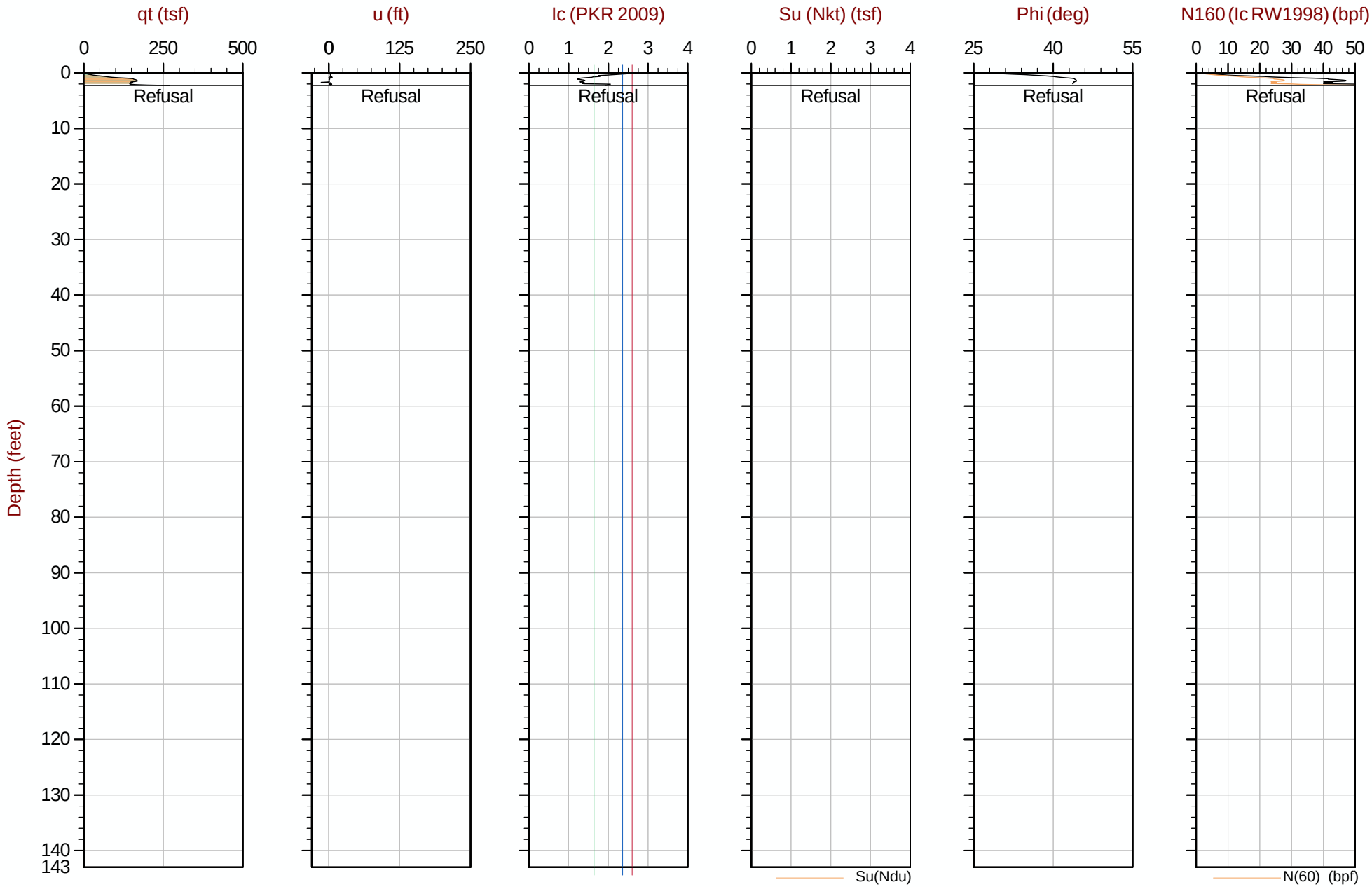
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 08:57
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14
Cone: 550:T1500F15U500



Max Depth: 0.700 m / 2.30 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP14.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833140m E: 398292m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

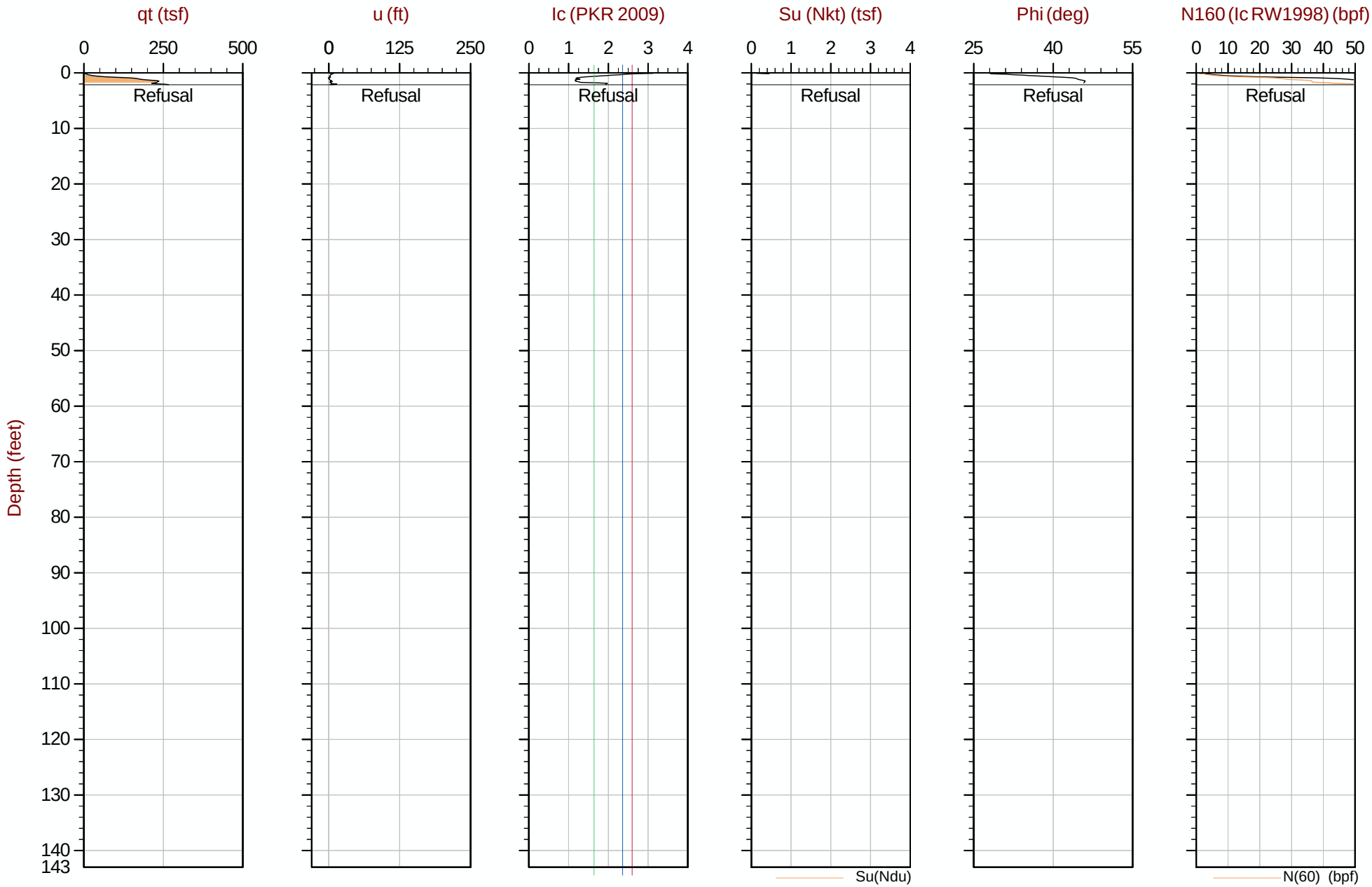
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-18 09:11
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14A
Cone: 550:T1500F15U500



Max Depth: 0.650 m / 2.13 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP14A.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833137m E: 398285m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

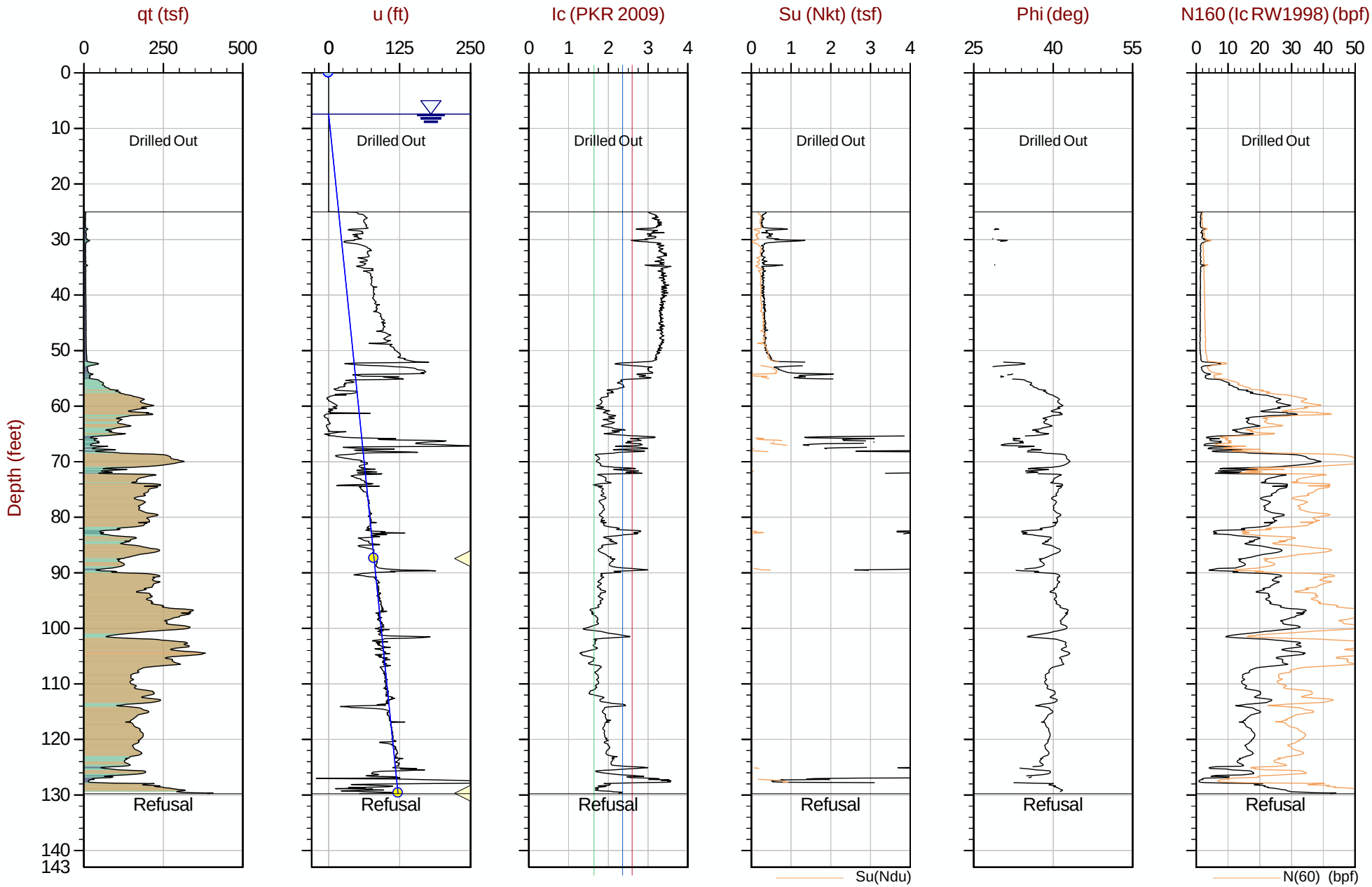
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 2018-09-20 04:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14B
Cone: 550:T1500F15U500



Max Depth: 39.550 m / 129.76 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-53107_CP14B.COR
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 19 N: 4833133m E: 398281m

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Pore Pressure Dissipation Summary and

Pore Pressure Dissipation Plots

Job No:	18-53107
Client:	S.W. Cole Engineering
Project:	Cold Storage Warehouse, Portland, ME
Start Date:	18-Sep-2018
End Date:	21-Sep-2018

CPTu PORE PRESSURE DISSIPATION SUMMARY

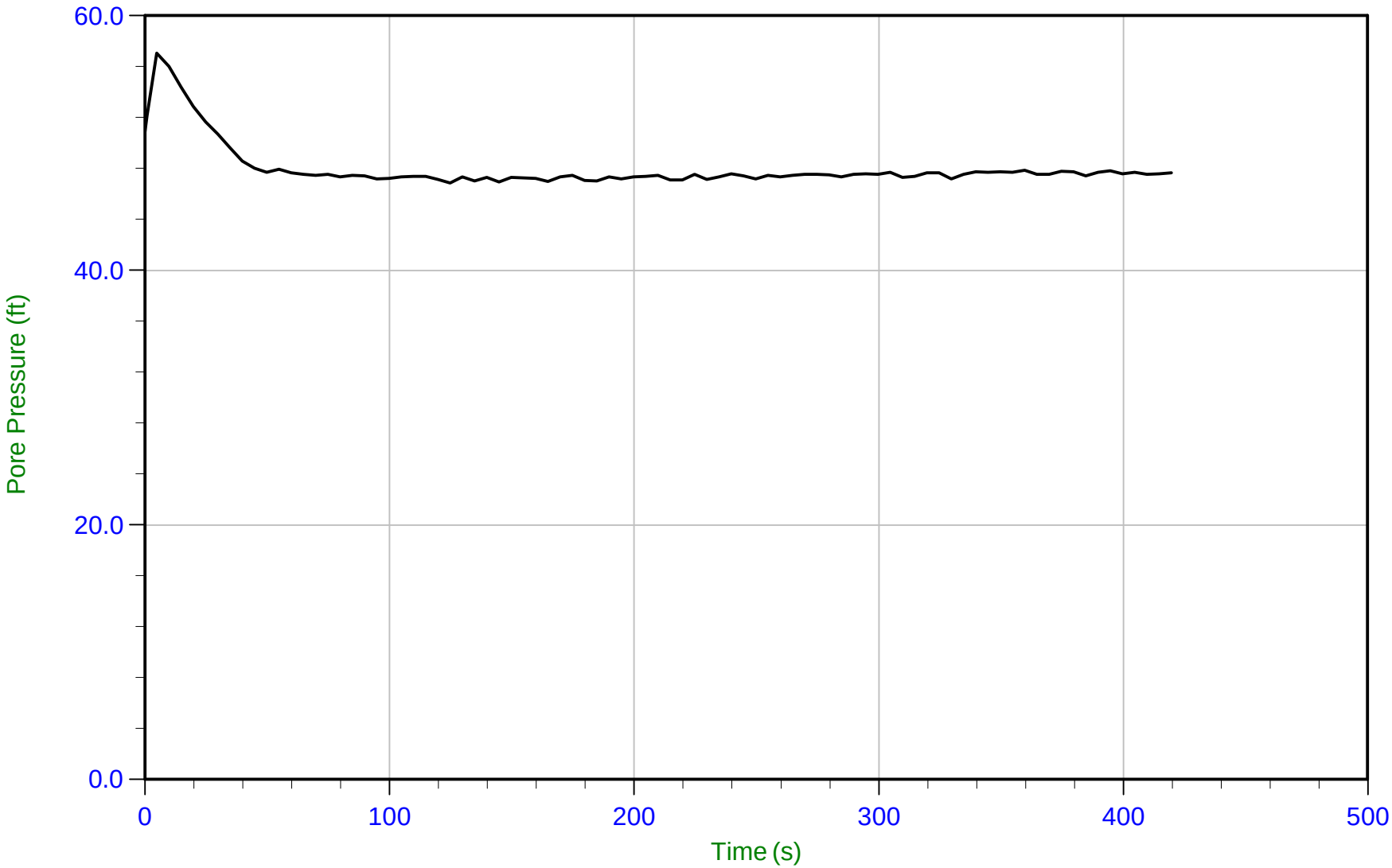
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)	Estimated Phreatic Surface (ft)
CPT18-02	18-53107_CP02.PPD	15	420	57.50	47.56	9.93	
CPT18-02	18-53107_CP02.PPD	15	125	74.88	64.87	10.01	
CPT18-05	18-53107_CP05.PPD	15	240	78.66	70.40	8.26	
CPT18-06A	18-53107_CP06A.PPD	15	300	73.41	64.87	8.54	
CPT18-07	18-53107_CP07.PPD	15	1105	139.76	133.63	6.13	
CPT18-08	18-53107_CP08.PPD	15	560	97.28	89.82	7.46	
CPT18-10	18-53107_CP10.PPD	15	50	89.07	79.64	9.44	
CPT18-11A	18-53107_CP11A.PPD	15	650	41.83	36.72		5.11
CPT18-11A	18-53107_CP11A.PPD	15	360	134.92	129.82	5.11	
CPT18-12C	18-53107_CP12C.PPD	15	495	84.07	78.91	5.16	
CPT18-14B	18-53107_CP14B.PPD	15	180	87.43	80.00	7.43	
CPT18-14B	18-53107_CP14B.PPD	15	210	129.67	122.73	6.95	
Totals	12 dissipations		78.3 min				

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/19/2018 23:26
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-02
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP02.PPD
Depth: 17.525 m / 57.496 ft
Duration: 420.0 s

U Min: 46.9 ft
U Max: 57.1 ft

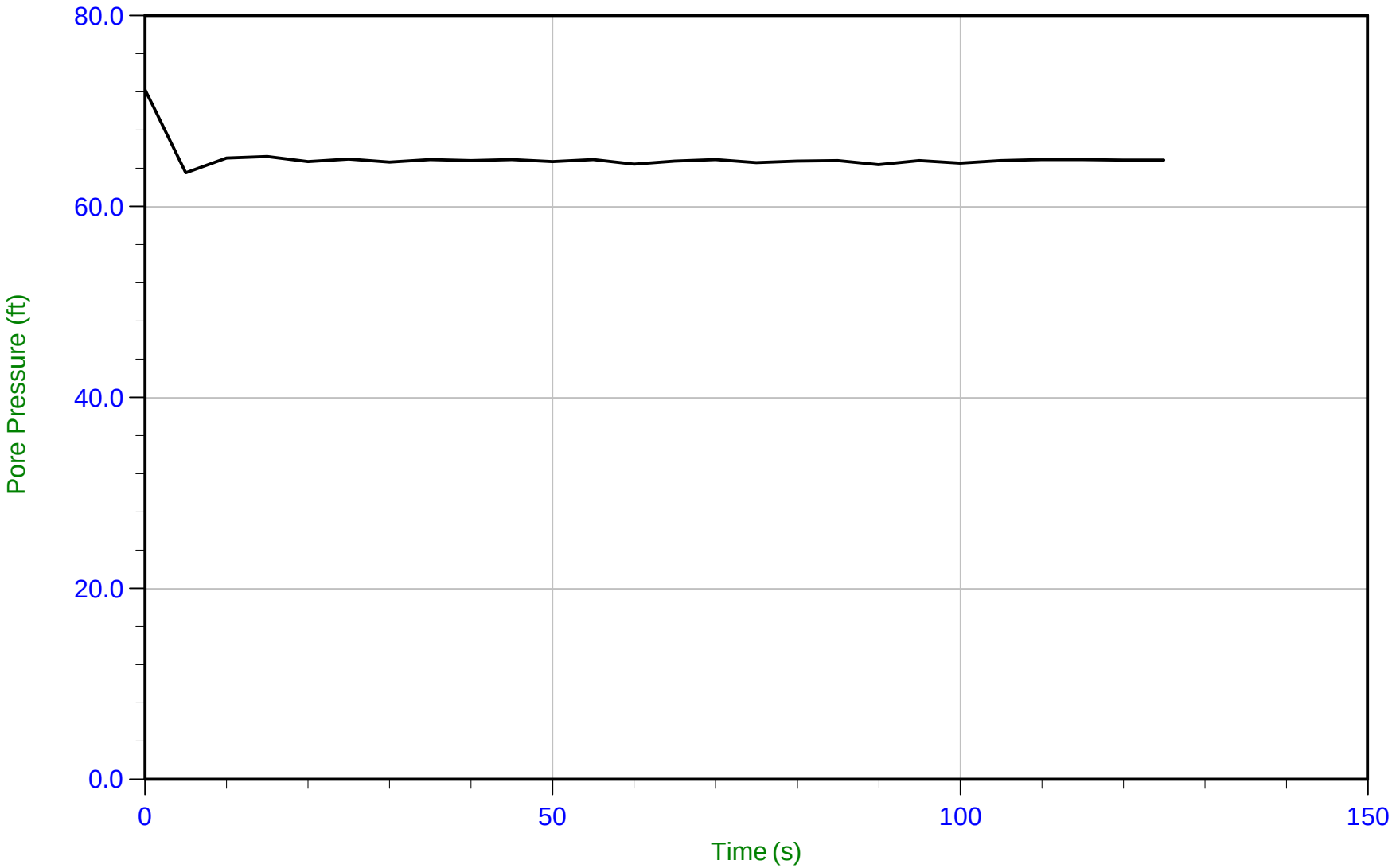
WT: 3.028 m / 9.933 ft
Ueq: 47.6 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/19/2018 23:26
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-02
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP02.PPD
Depth: 22.825 m / 74.884 ft
Duration: 125.0 s

U Min: 63.6 ft
U Max: 72.3 ft

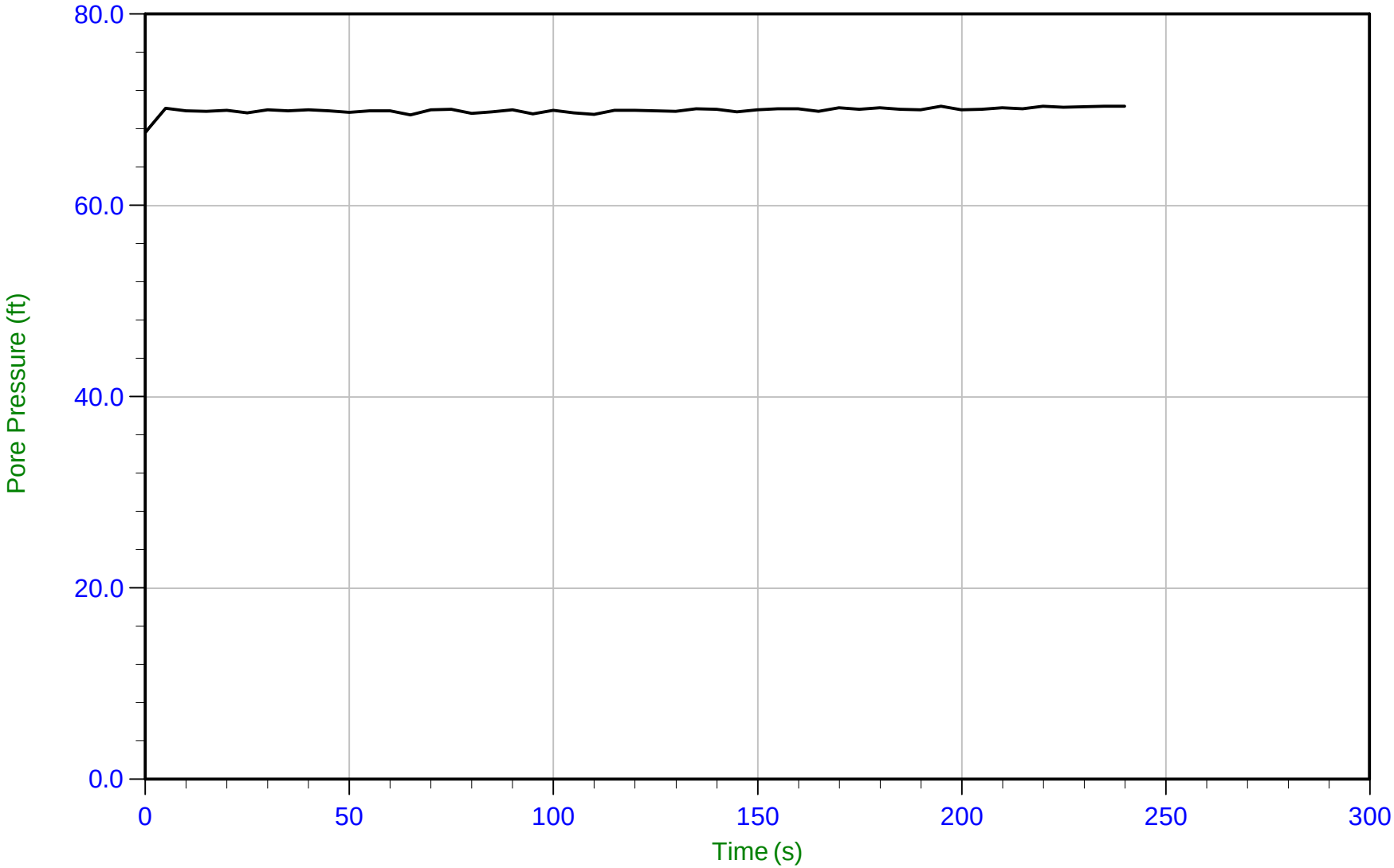
WT: 3.052 m / 10.012 ft
Ueq: 64.9 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/21/2018 13:14
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-05
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP05.PPD
Depth: 23.975 m / 78.657 ft
Duration: 240.0 s

U Min: 67.6 ft
U Max: 70.4 ft

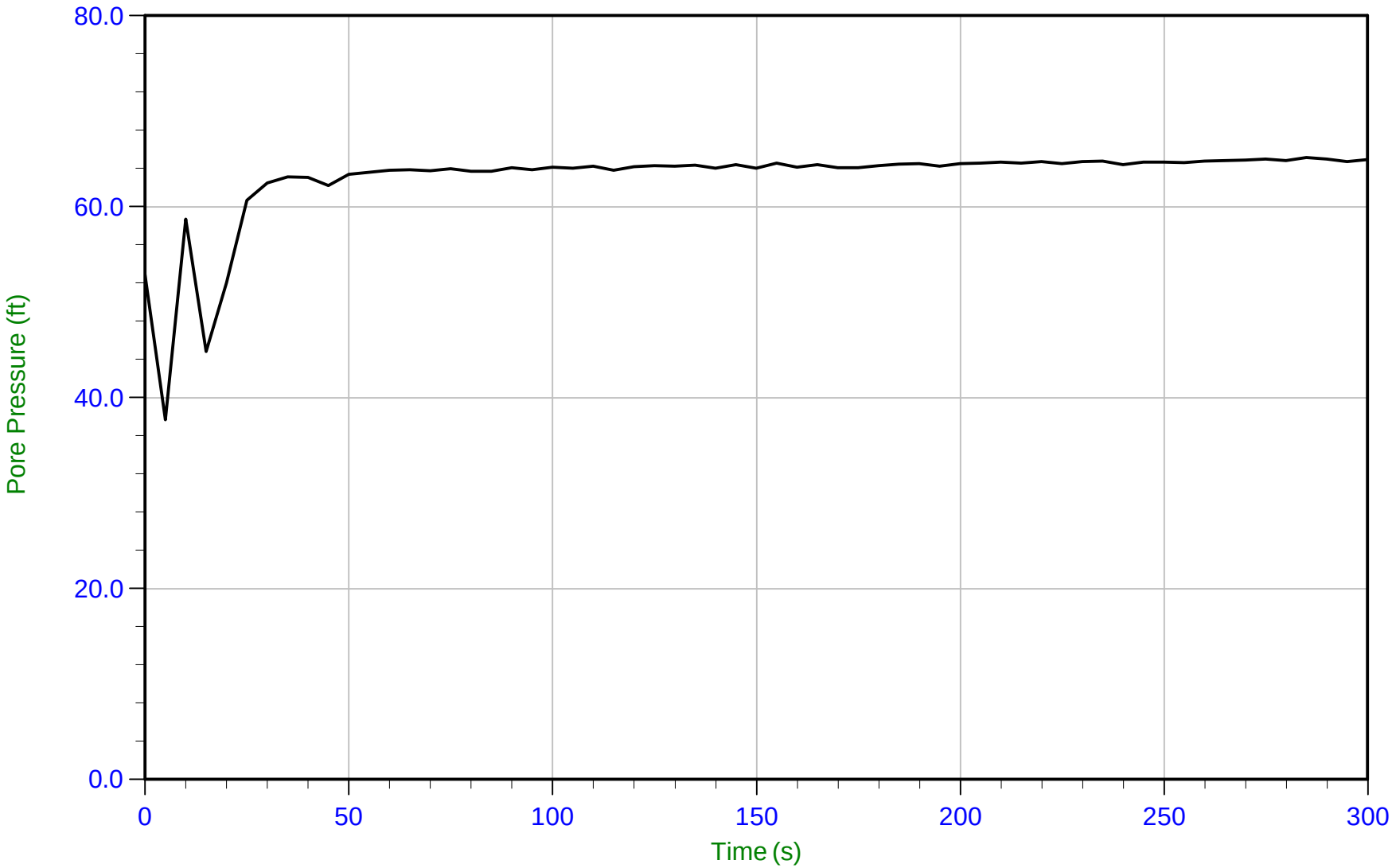
WT: 2.517 m / 8.258 ft
Ueq: 70.4 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/21/2018 08:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-06A
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP06A.PPD
Depth: 22.375 m / 73.408 ft
Duration: 300.0 s

U Min: 37.7 ft
U Max: 65.1 ft

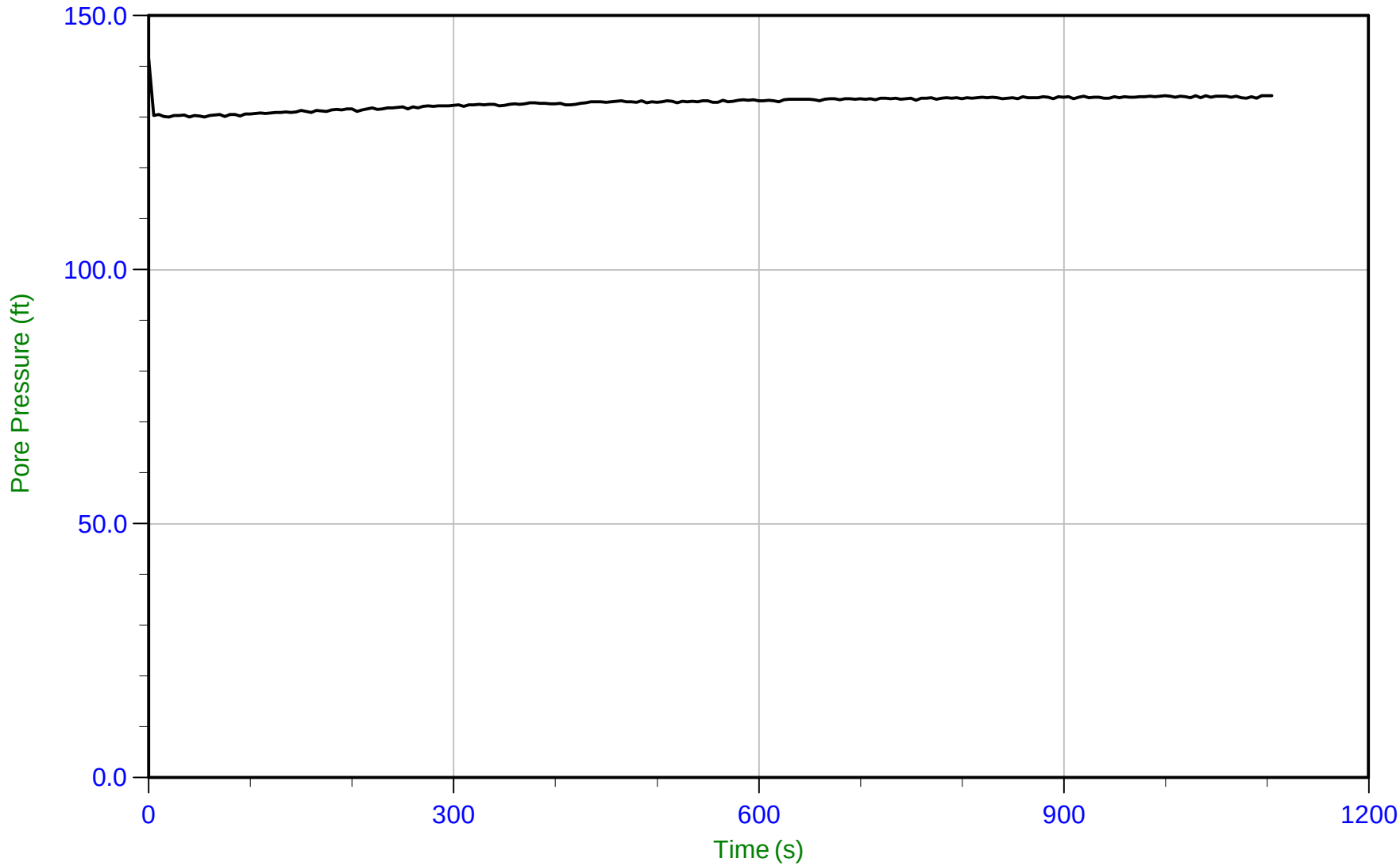
WT: 2.602 m / 8.536 ft
Ueq: 64.9 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/20/2018 14:41
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-07
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP07.PPD
Depth: 42.600 m / 139.762 ft
Duration: 1105.0 s

U Min: 130.0 ft
U Max: 141.5 ft

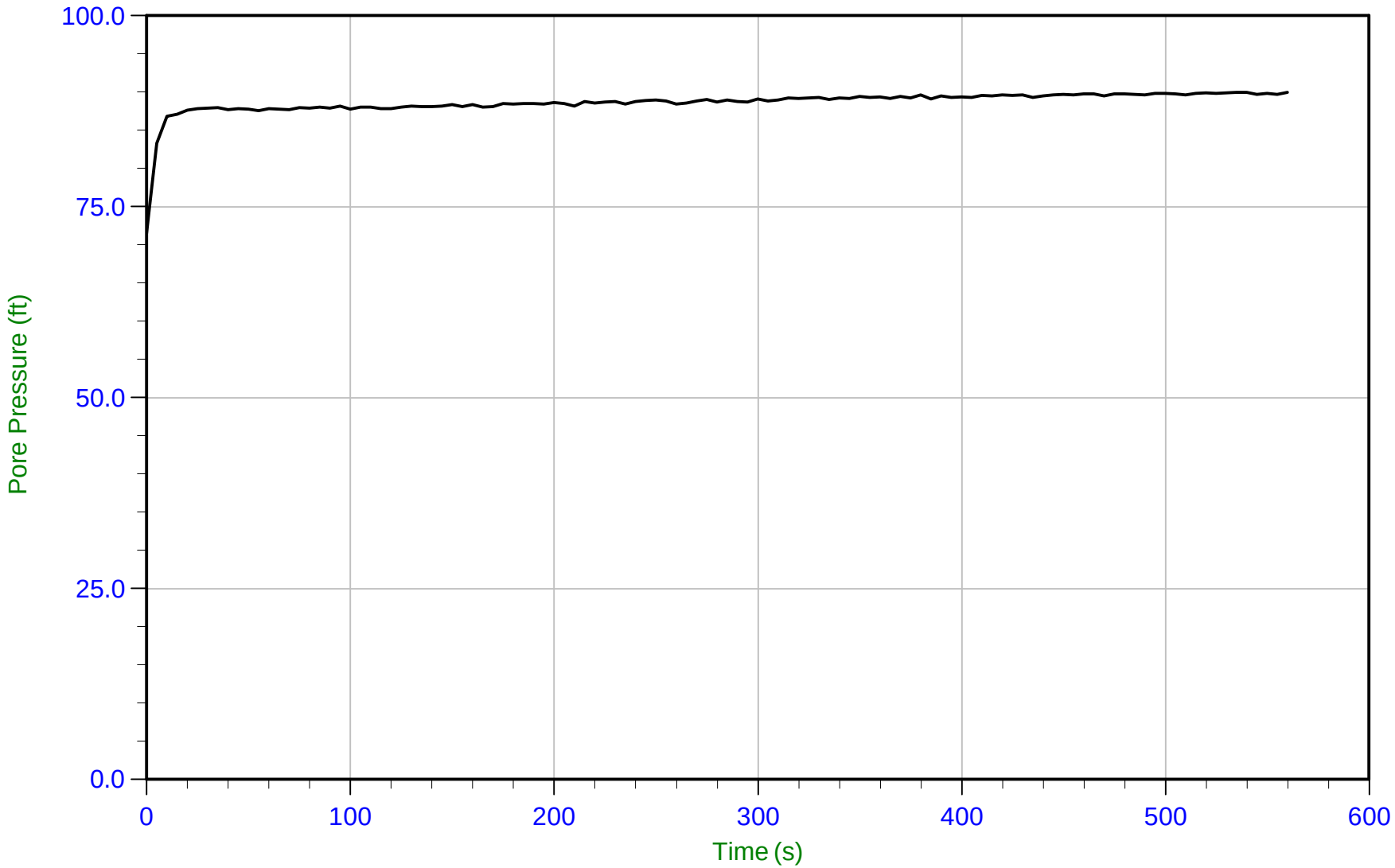
WT: 1.868 m / 6.127 ft
Ueq: 133.6 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/21/2018 14:51
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-08
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP08.PPD
Depth: 29.650 m / 97.276 ft
Duration: 560.0 s

U Min: 71.5 ft
U Max: 90.0 ft

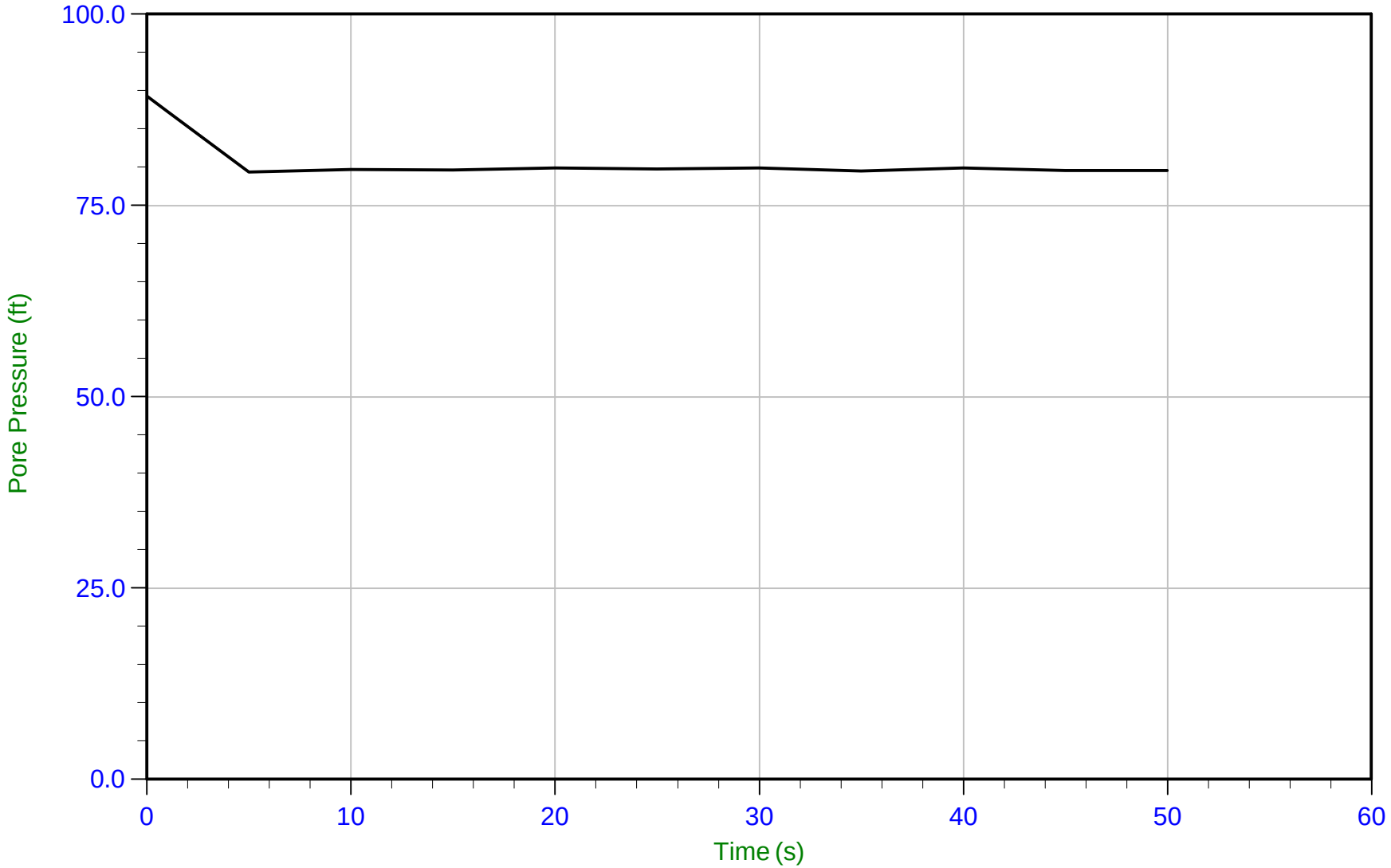
WT: 2.273 m / 7.459 ft
Ueq: 89.8 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/20/2018 11:42
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-10
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP10.PPD
Depth: 27.150 m / 89.074 ft
Duration: 50.0 s

U Min: 79.4 ft
U Max: 89.3 ft

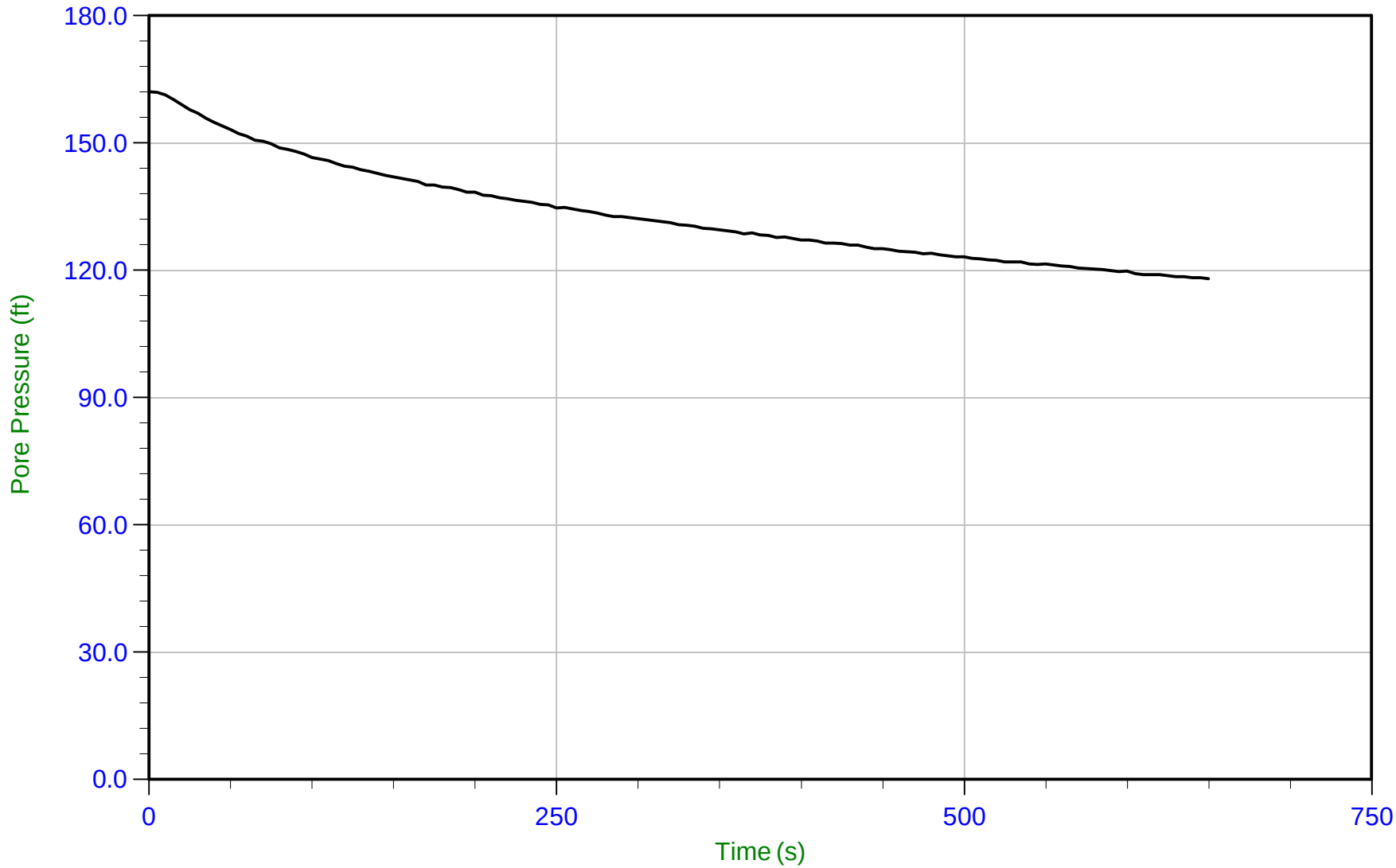
WT: 2.877 m / 9.438 ft
Ueq: 79.6 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/18/2018 10:12
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-11A
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP11A.PPD
Depth: 12.750 m / 41.830 ft
Duration: 650.0 s

U Min: 118.1 ft
U Max: 162.1 ft

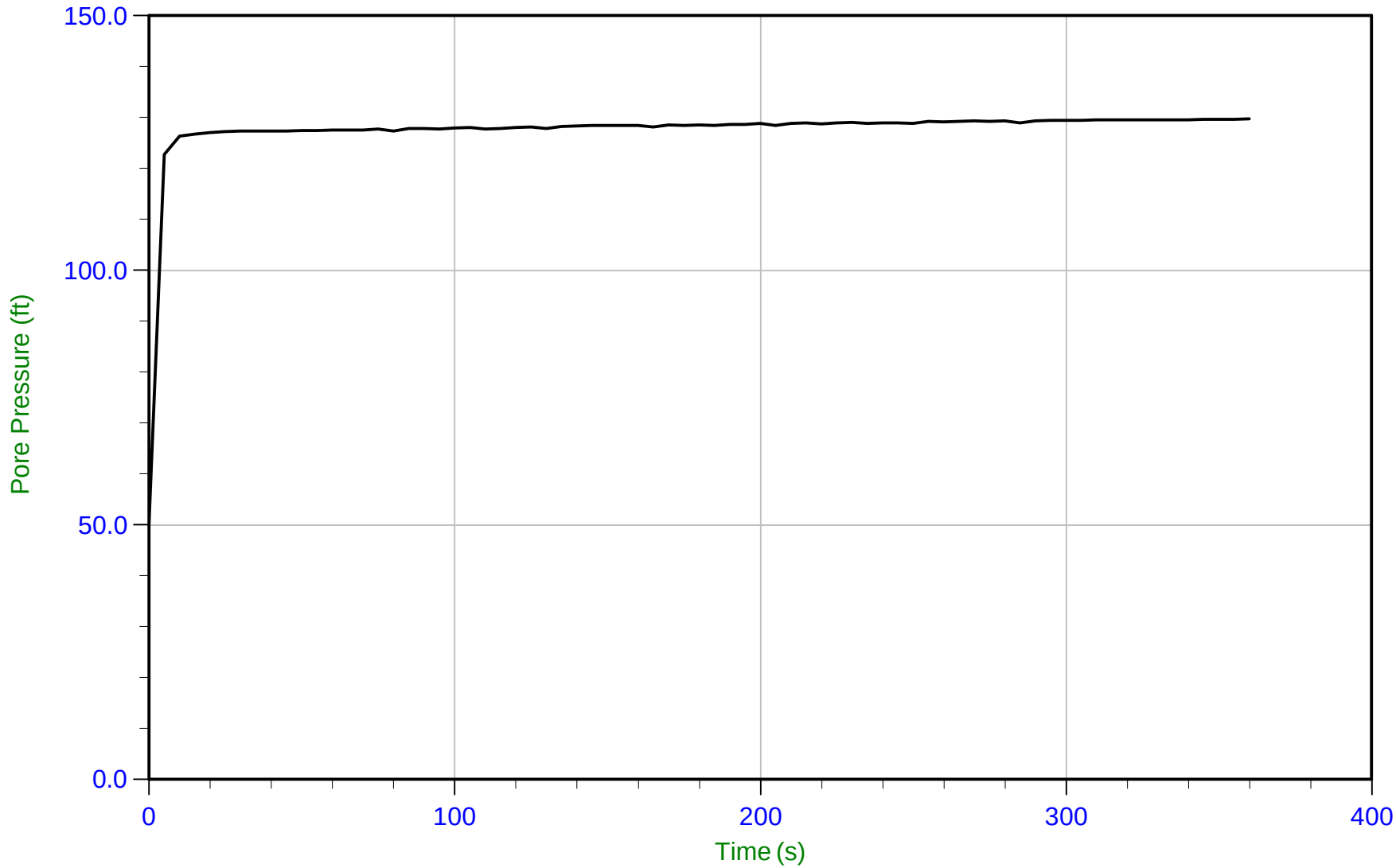
WT: 1.556 m / 5.106 ft
Ueq: 36.7 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/18/2018 10:12
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-11A
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP11A.PPD
Depth: 41.125 m / 134.923 ft
Duration: 360.0 s

U Min: 50.3 ft
U Max: 129.8 ft

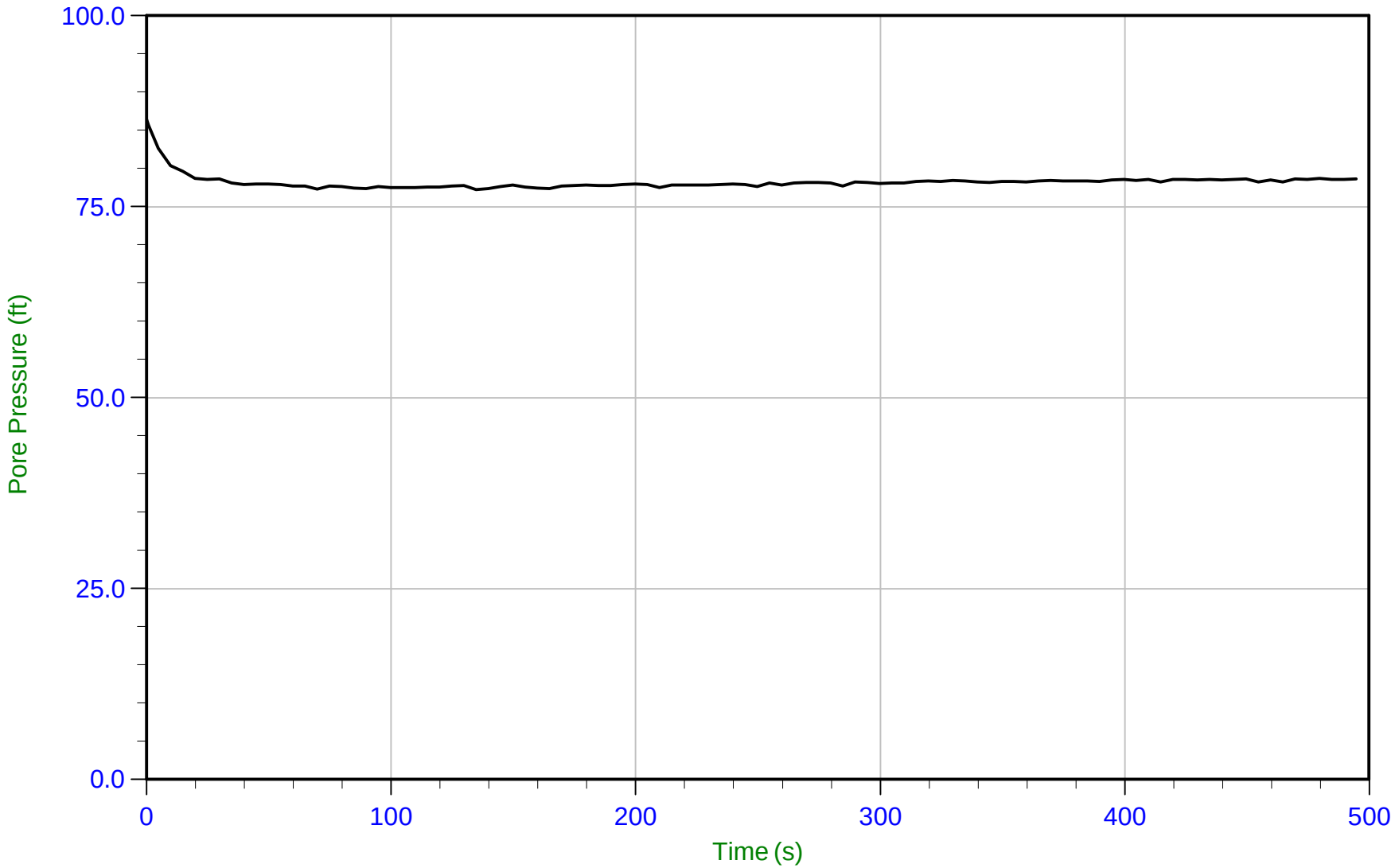
WT: 1.556 m / 5.106 ft
Ueq: 129.8 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/20/2018 08:30
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-12C
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP12C.PPD
Depth: 25.625 m / 84.071 ft
Duration: 495.0 s

U Min: 77.3 ft
U Max: 86.4 ft

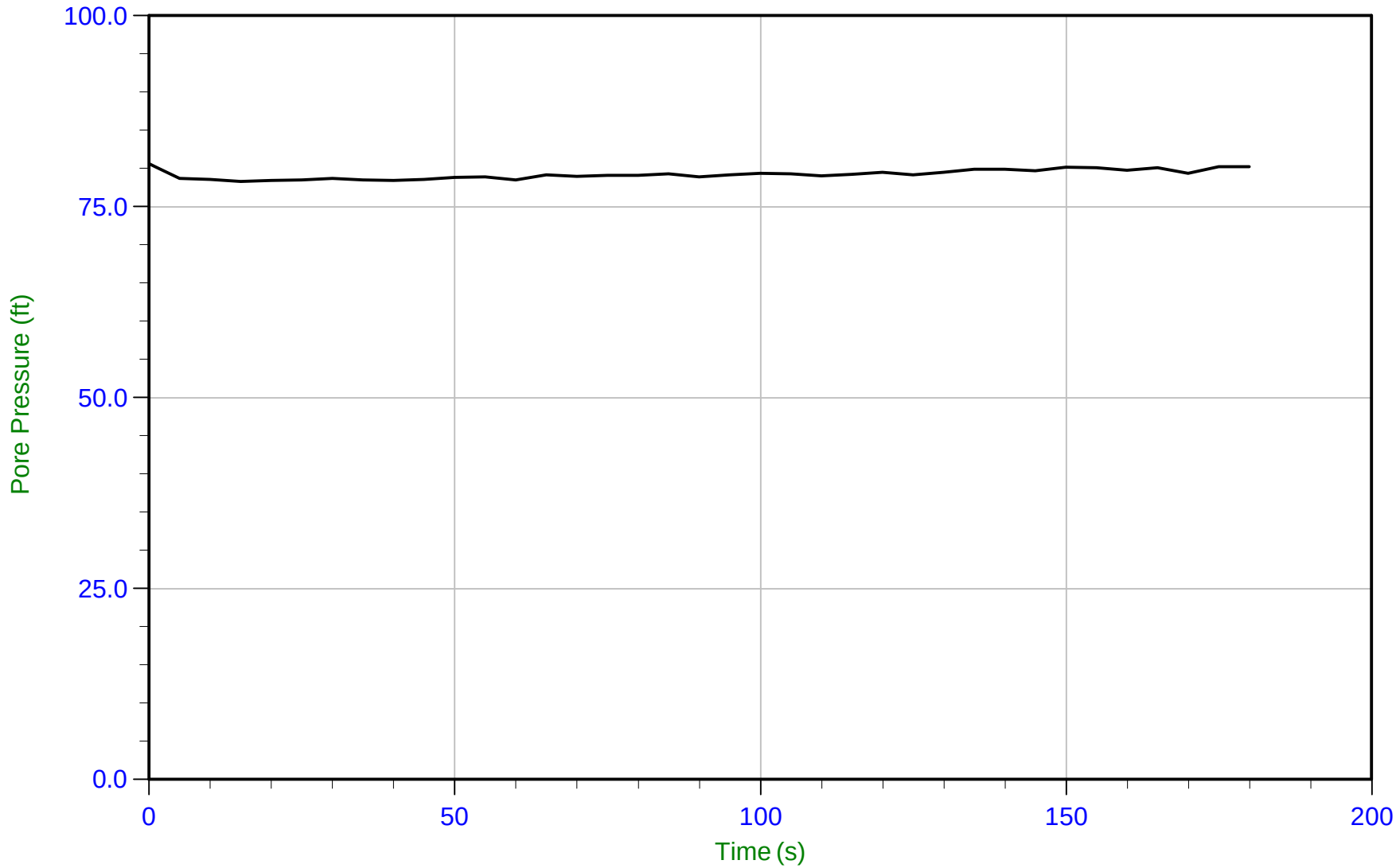
WT: 1.574 m / 5.162 ft
Ueq: 78.9 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/20/2018 04:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14B
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP14B.PPD
Depth: 26.650 m / 87.433 ft
Duration: 180.0 s

U Min: 78.3 ft
U Max: 80.6 ft

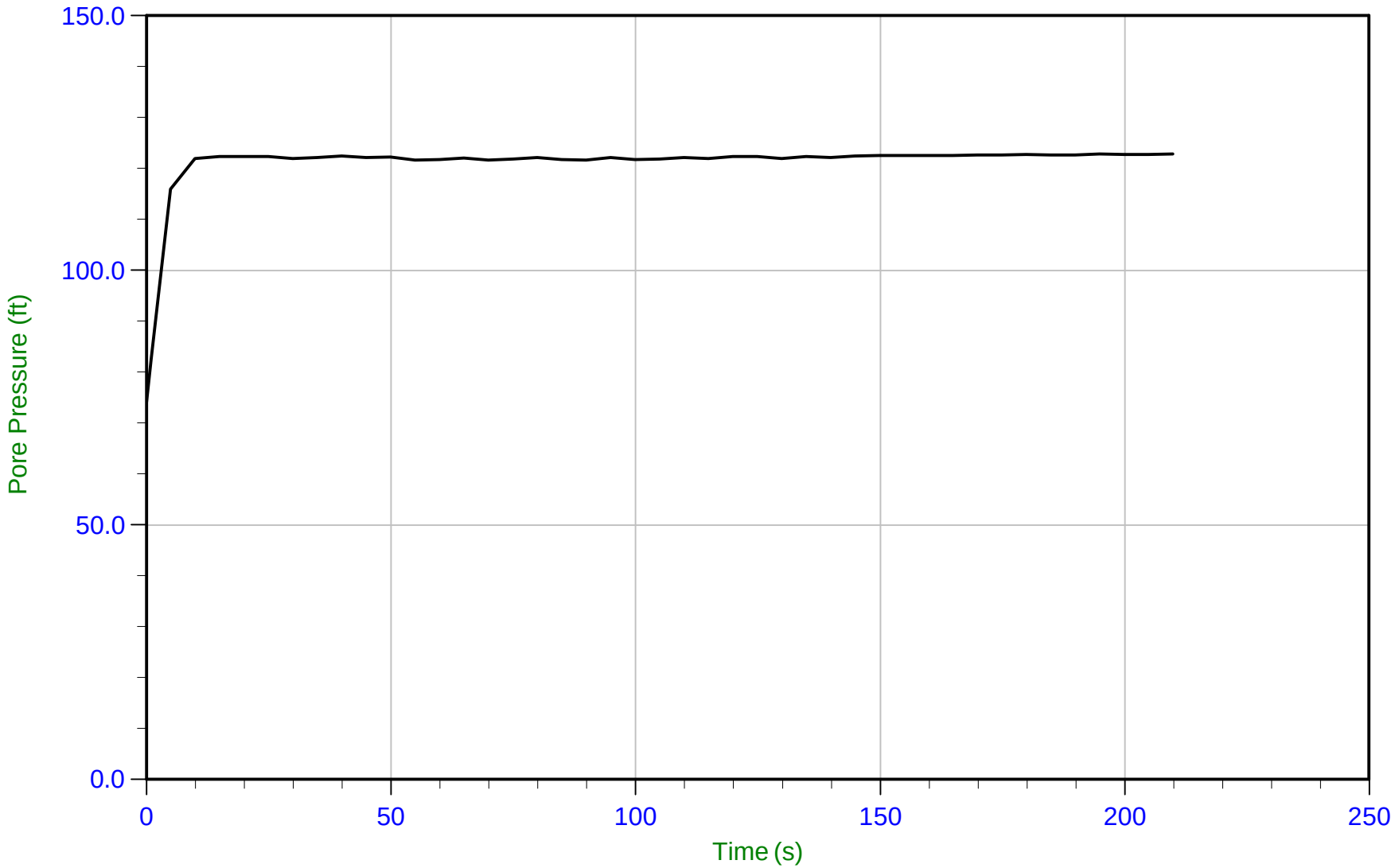
WT: 2.266 m / 7.434 ft
Ueq: 80.0 ft

CONETEC

SW Cole Engineering

Job No: 18-53107
Date: 09/20/2018 04:17
Site: Cold Storage Warehouse, Portland, ME

Sounding: CPT18-14B
Cone: 550:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 18-53107_CP14B.PPD
Depth: 39.525 m / 129.674 ft
Duration: 210.0 s

U Min: 74.2 ft
U Max: 122.9 ft

WT: 2.118 m / 6.948 ft
Ueq: 122.7 ft

APPENDIX E

Geophysical Testing Report

HAGER-RICHTER
GEOSCIENCE, INC.

SHEAR WAVE VELOCITY TESTING
FORMER PORTLAND GAS WORKS SITE
400 COMMERCIAL STREET
PORTLAND, MAINE

Prepared for:

S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way, Suite D10
Salem, New Hampshire 03079

File 17J109
January, 2018

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1. General Site Location
2. pVs Survey Line Locations

APPENDIX

1. Boring Locations and Logs Provided by S.W. Cole

1. INTRODUCTION

Hager-Richter Geoscience, Inc. (Hager-Richter) conducted passive surface shear wave velocity testing at the Former Portland Gasworks Site located at 400 Commercial Street in Portland, Maine in December, 2017 for S. W. Cole Engineering Inc., (S.W. Cole) of Gray, Maine. The geophysical testing was performed as part of a geotechnical investigation of the project site by S.W. Cole.

The site is the location of the former Portland Gasworks located at 400 Commercial Street in Portland. The property is located on the south side of Commercial Street at the intersection with York Street. Figure 1 shows the general location of the site. According to information provide by S.W. Cole, a low temperature warehouse is planned for the vacant Site. Stratigraphy at the Site reportedly consists of fill overlying soft clay and silt to depths of over 100 feet. Bedrock was not encountered in borings installed at the Site. S.W.Cole requested site specific shear wave velocity information as a function of depth for the soil and bedrock to a depth of 100 feet for the determination of seismic site class at the site.

The surface shear wave velocity testing was conducted using the passive shear wave seismic (pVs) method. Figure 2 is a Google Earth image of the site showing the location of the three seismic testing lines specified by S.W. Cole.

Jeffrey Reid, P.G., and Sean Reid of Hager-Richter conducted the seismic testing on December 19, 2017. The project was coordinated with Mr. Tim Boyce, P.E., of S.W. Cole. Mr. Patrick Otto, also of S.W. Cole, was present on site for the fieldwork and specified the pVs line location. Data analysis and interpretation were completed at the Hager-Richter offices. Original data and field notes will be retained in the Hager-Richter files for a minimum of three years.

2. EQUIPMENT AND PROCEDURES

2.1 Method

The passive shear wave seismic (pVs) method is a geophysical method to determine a shear-wave velocity profile at a single location by analyzing a particular type of seismic wave recorded on a multichannel record. The name pVs is derived from p for passive and Vs for velocity of shear waves. The pVs method, also called the Refraction Microtremor method, or ReMi™, uses Rayleigh waves, a particular kind of wave first described by Lord Rayleigh in 1885. Such waves are dispersive (meaning that the velocity is a function of the wavelength), and the amplitude of such waves decreases with depth. The velocity depends primarily on the shear wave velocities and layering of the subsurface material.

Rayleigh waves are a significant part of the ambient subsurface noise at most, if not all, sites. There are many sources of such noise, including, but not limited to, wind, pedestrian and vehicular traffic, surface and subway trains, and construction activities. Although such noise can be troublesome for most seismic methods, it is the source of signals for the pVs method, and the higher the noise level, the better the results for this method.

Low frequency (4.5 Hz) geophones are installed five feet apart along a straight line and connected to a seismograph. The ambient noise is recorded for 30 seconds two or three times, and examined to be sure that noise of sufficiently low frequency is present. If the noise is sufficient, then 10 to 15 such records are acquired. If the noise spectra do not reach sufficiently low frequencies, then one walks or runs along the testing line during data acquisition to add low frequency noise to the ambient noise. The surface waves used in the pVs method, considered noise in seismic refraction and seismic reflection surveys, are enhanced during data acquisition and processing for the pVs method. The seismic data are analyzed using SeisOpt® ReMi™, a commercially licensed software package developed by Optim, Inc. located at the University of Nevada at Reno. Results are normally presented as 1-D plots or in tabular form showing shear wave velocity as a function of depth for the center point of the seismic line.

2.2 Determination of Average Shear Wave Velocity for Building Code Purposes

The pVs method determines (a) the shear wave velocity at the mid point along a survey line for several layers, averaged over the length of the survey line, and (b) the average shear wave velocity V_{avg} for site classification for seismic design in accordance with building codes. Similar calculations can be performed with the results of the shear wave velocity survey. The average value V_{avg} is determined using the equation 16-44 of the IBC as follows:

$$V_{avg} = \left(\sum_{i=1}^{N} d_i\right) / \sum_{i=1}^{N} d_i / V_i$$

where d_i is thickness of layer i
V_i is shear wave velocity of layer i
N denotes the total number of layers

The Seismic Site Class, *based solely on average shear wave velocity*, is defined by the IBC as follows:

Site Class	Soil Profile Name	Soil Shear Wave Velocity (ft/s)
A	Hard rock	$V_s > 5000$
B	Rock	$2500 < V_s \leq 5000$
C	Very dense soil and soft rock	$1200 < V_s \leq 2500$
D	Stiff soil profile	$600 \leq V_s \leq 1200$
E	Soft soil profile	$V_s < 600$

Although the IBC provides other methods to determine the Site Class, such as standard penetration resistance (blow counts) and soil undrained shear strength, this report provides shear wave velocity data only. There is no consideration of other factors that may affect a site class such as liquefaction. The final determination of seismic site class should be made by the project engineer.

2.3 Equipment

We used a 48-channel digital seismograph (Geometrics Geode) coupled to 48 geophones to acquire the pVs data for the subject testing. We used 4.5-Hz frequency vertical geophones for the subject shear wave velocity testing.

2.4 Limitations of the Method

As with all physical measurements, there is experimental error in the velocities that are determined using the passive shear wave velocity method. For the pVs method, the accuracy of V_{avg} is stated by Optim, Inc. to be 5-15%.

The depth of investigation is a function of the noise spectrum, and long wave lengths (low frequencies) are required to determine velocity at large depths. Noise levels can be improved by a person running along the seismic spread during data acquisition.

2.5 Site Specific

The locations of the pVs test lines at the subject site are shown in Figure 2. The position of the pVs testing lines were located using a Trimble Geo 7X CM GPS receiver coupled with a Zephyr-2 external antenna. The pVs data were acquired using 48 4.5Hz geophones and a geophone spacing of 6 feet for Line 1 and 5 feet for Lines 2 and 3. The pVs method yields a simple vertical shear wave velocity profile for the mid-point of the test line. The seismic source for the pVs testing was ambient noise from nearby traffic and activity as well as thumping along the lines with a sledge hammer. Photo 1 shows the general surface conditions encountered.



Photo 1. View looking south along pVs Test Line 3. Geophones were installed into the sand and gravel below the snow. Note the S.W. Cole drill rig in the background.

3. RESULTS AND DISCUSSION

The surface shear wave velocity testing was conducted using the passive shear wave seismic (pVs) method at three test locations specified by S.W. Cole and designated as Lines 1-3. The test locations and center points for the velocity profiles are shown in Figure 2.

According to information provided by S.W.Cole, stratigraphy consists of fill overlying soft clay and silt to depths of over 100 feet. Bedrock was not encountered in borings installed at the Site.

The quality for the pVs data at the subject site is judged to be very good. The results of the pVs testing are reported in Table 1. The pVs results are derived over test lines that span about 200-250 feet, providing an average velocity structure over the length of the test line. However, the borings provide very localized point information. Because of the localized nature of the boring data, no attempt was made to "force" a specific velocity model based on the boring data provided by SW Cole to remove any possible local bias from a point source. For modeling purposes, the subsurface stratigraphy was divided into four or five discrete units. The layer thicknesses that provide the best statistical fit to the dispersion curve are used for the models.

The root mean square error for the fit of the dispersion curves versus the measured data using the model velocities is 1.6% , 1.9%, and 2.9%, respectively, for pVs Lines 1-3. These very low error values indicate that the models fit the data extremely well. While the resulting velocity units do not necessarily correlate with specific lithologic units identified in any individual boring, there is very good general correlation between the generated velocity models the general site-wide stratigraphy.

The shear wave velocities for the individual stratigraphic modeled units are provided in Table 1. The average value of the velocity of shear waves for the depth interval of 0-100 ft based on Equation 1 of the IBC , Vs_{100}, are provided in Table 1 as 650 fps, 667 fps, and 611 fps, respectively, for Lines 1-3.

TABLE 1: pVs TEST RESULTS

Geologic Unit *	Line 1	
	Depth Interval (ft)	**Vs** (ft/s)**
Loose Fill	0 - 10	422
More Dense Fill	10 - 16.5	1,582
Soft Clay and Silt	16.5 - 65	503
More Dense Sand and Silt (Till ?)	65 - 100	1,178
Vs_{100} (ft/s)	650	
RMS	1.6%	
Geologic Unit *	**Line 2**	
	Depth Interval (ft)	**Vs** (ft/s)**
Loose Fill	0 - 11	481
More Dense Fill	11 - 17	1,846
Soft Clay and Silt	17 - 69	537
More Dense Sand and Silt (Till ?)	69 - 100	1,156
Vs_{100} (ft/s)	667	
RMS	1.9%	
Geologic Unit *	**Line 3**	
	Depth Interval (ft)	**Vs** (ft/s)**
Loose Fill	0 - 5	456
Dense Fill	5 - 13	756
Soft Clay and Silt	13 - 52	503
Soft Clay and Silt (cont.)	52 - 80	532
More Dense Sand and Silt (Till ?)	80 - 100	1,657
Vs_{100} (ft/s)	611	
RMS	2.9%	

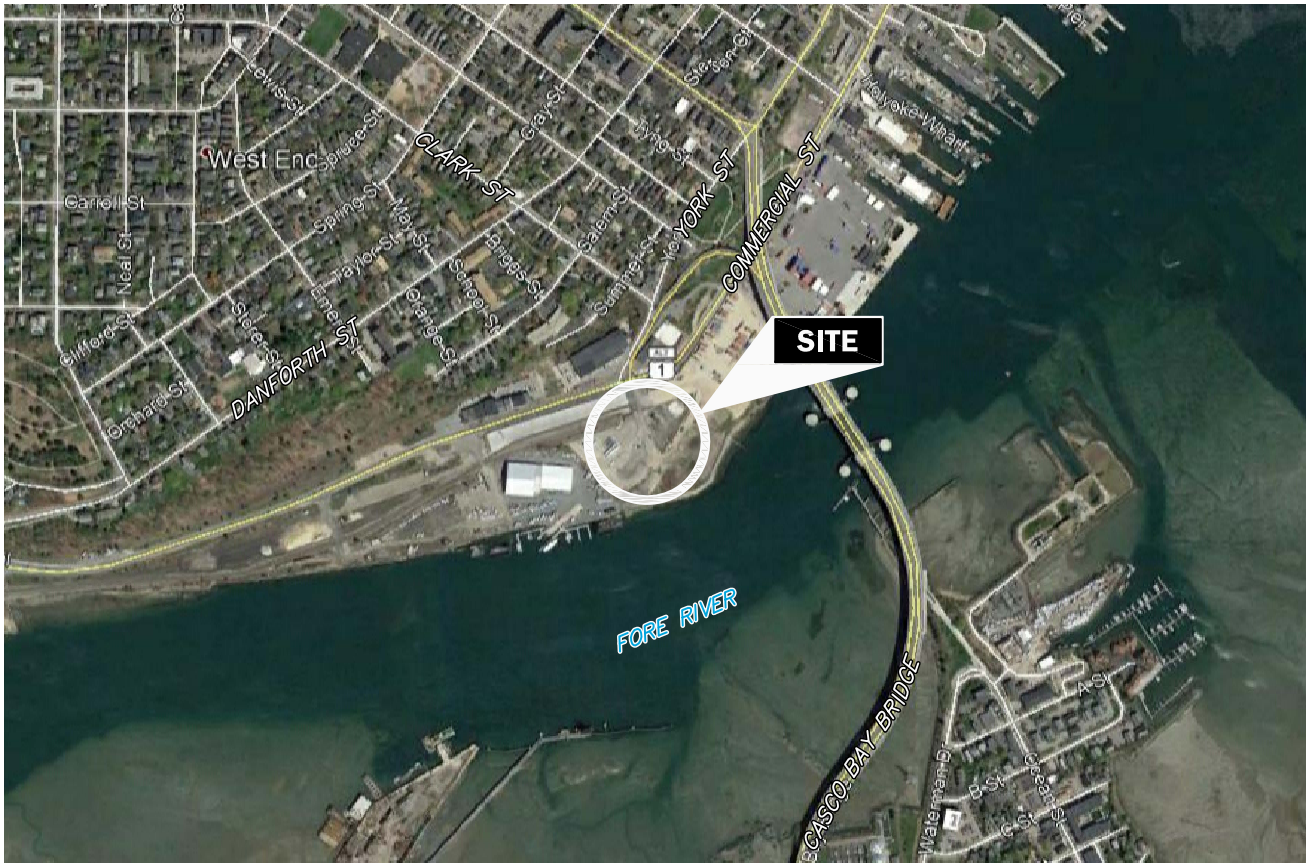
* Part of the description of stratigraphy is based on boring logs provided by S.W. Cole
** Shear wave velocity profile is determined for the mid-point of the testing line

4. LIMITATIONS

This report was prepared for the exclusive use of S. W. Cole Engineering, Inc. (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

H-R has used reasonable care, skill, competence and judgment in the preparation of this Report consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.



NOTE:

Modified from Google Earth Pro aerial photograph.



LOCATION

Figure 1
General Site Location
Former Portland Gasworks Site
Commercial Street
Portland, Maine

File 17J109 | January, 2018

HAGER–RICHTER
Salem, NH | Fords, NJ



N

H-R

LEGEND

pVs TEST LINE WITH MIDPOINT

SCALE (feet)

0 200 400

NOTE:

Modified from Google Earth Pro aerial photograph.

Figure 2
pVs Test Line Locations
Former Portland Gasworks Site
Commercial Street
Portland, Maine

File 17J109 | January, 2018

HAGER–RICHTER
Salem, NH | Fords, NJ

APPENDIX F

Laboratory Test Results

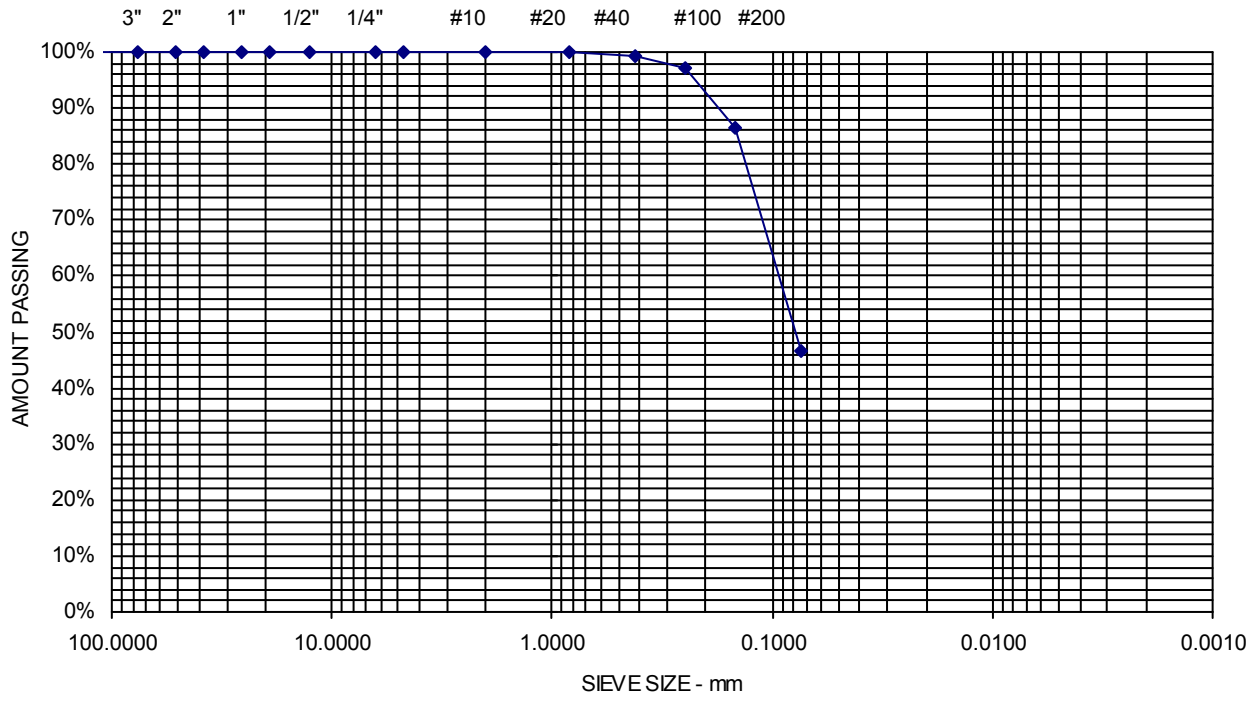
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23279G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1001A 4D 30-32**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**99**	53.3% Sand
250 um	**No. 60**	**97**	
150 um	**No. 100**	**86**	
75 um	**No. 200**	**46.7**	46.7% Fines



Comments: w = 24.5%

Sheet

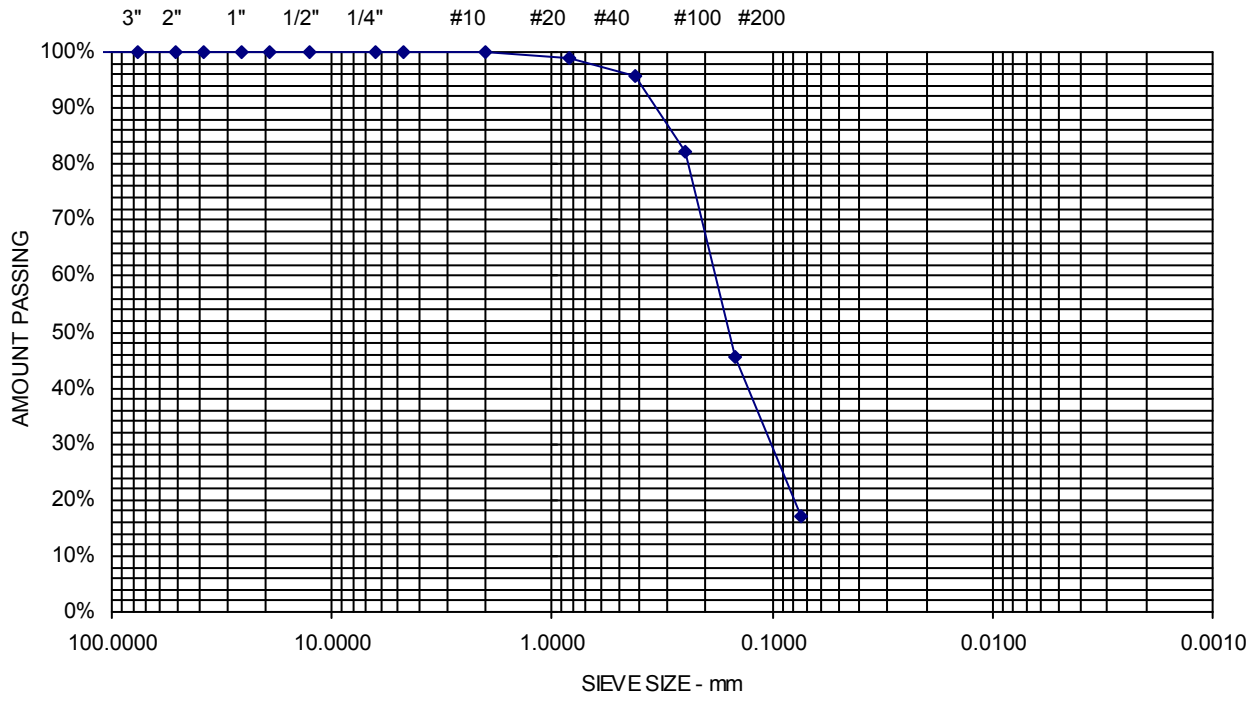
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23280G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1001A 6D 40-42**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**99**	
425 um	**No. 40**	**96**	82.8% Sand
250 um	**No. 60**	**82**	
150 um	**No. 100**	**46**	
75 um	**No. 200**	**17.2**	17.2% Fines



Comments: w = 19.4%

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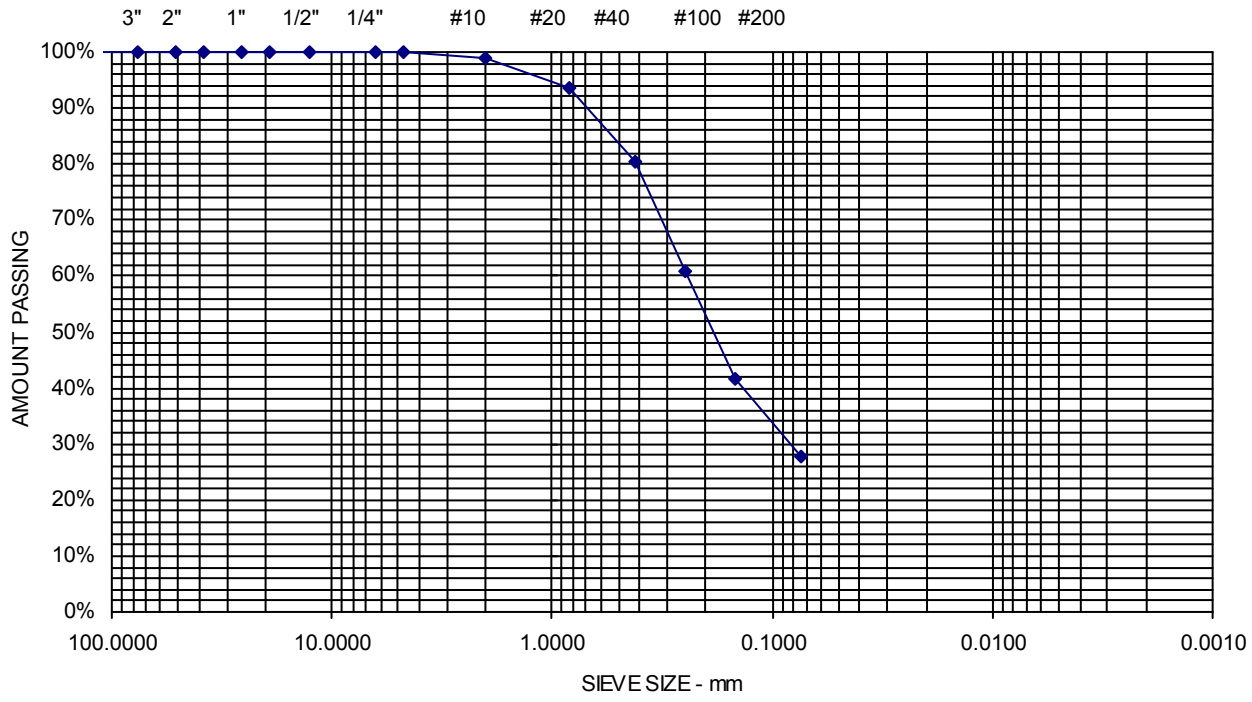
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23281G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1001A 8D 50-52**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**93**	
425 um	**No. 40**	**80**	72.4% Sand
250 um	**No. 60**	**61**	
150 um	**No. 100**	**42**	
75 um	**No. 200**	**27.6**	27.6% Fines



Comments: w = 21.2%

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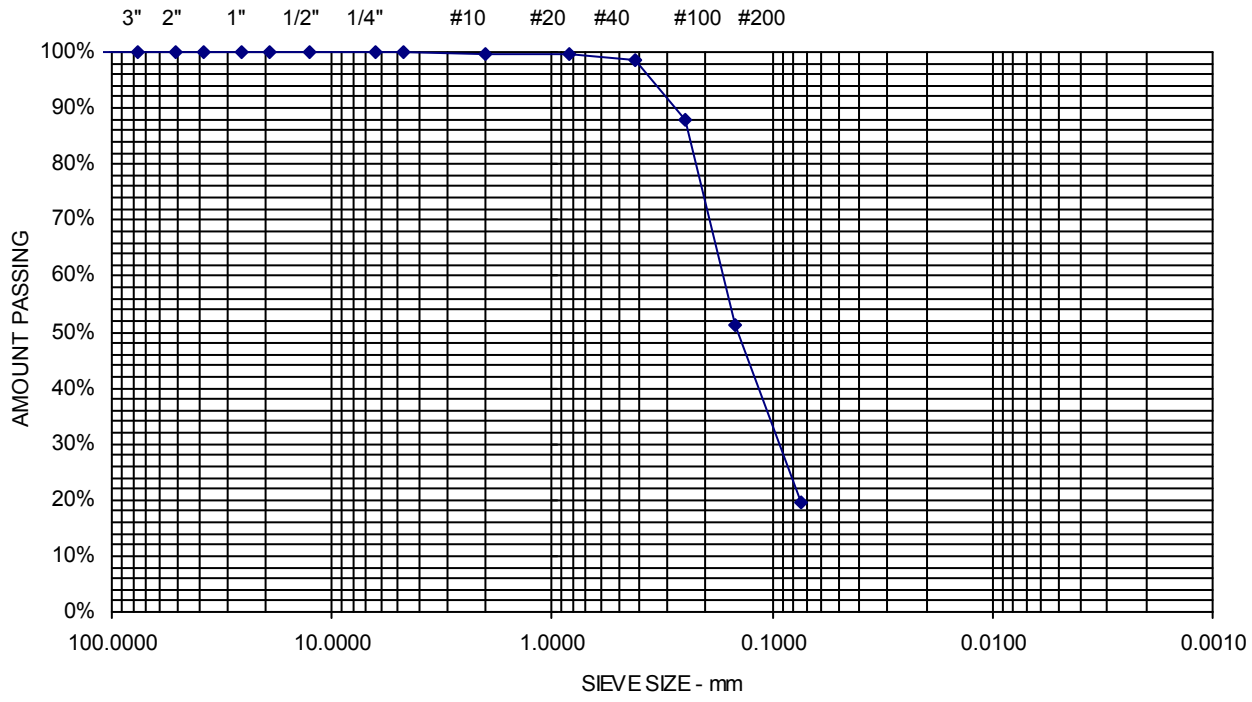
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23283G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1002 6D 25-27**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**98**	80.3% Sand
250 um	**No. 60**	**88**	
150 um	**No. 100**	**51**	
75 um	**No. 200**	**19.7**	19.7% Fines



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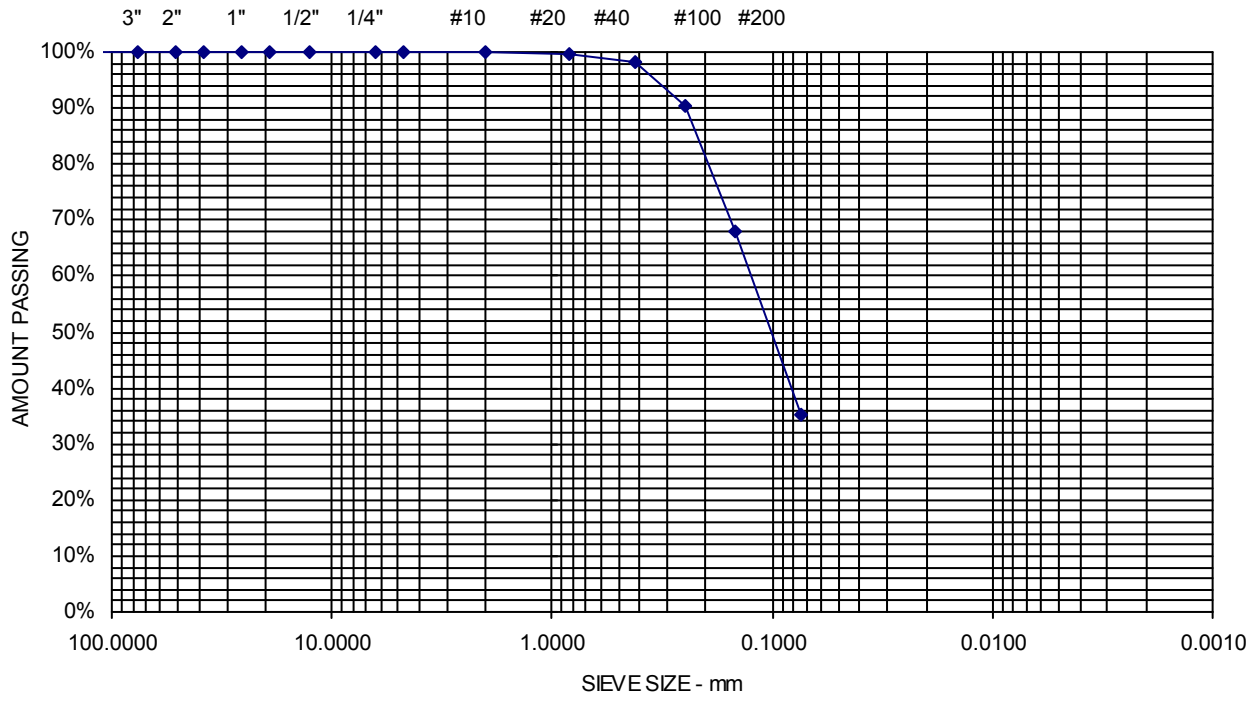
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23284G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1002 8D 35-37**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**98**	64.6% Sand
250 um	**No. 60**	**90**	
150 um	**No. 100**	**68**	
75 um	**No. 200**	**35.4**	35.4% Fines



Comments: w = 22.4%

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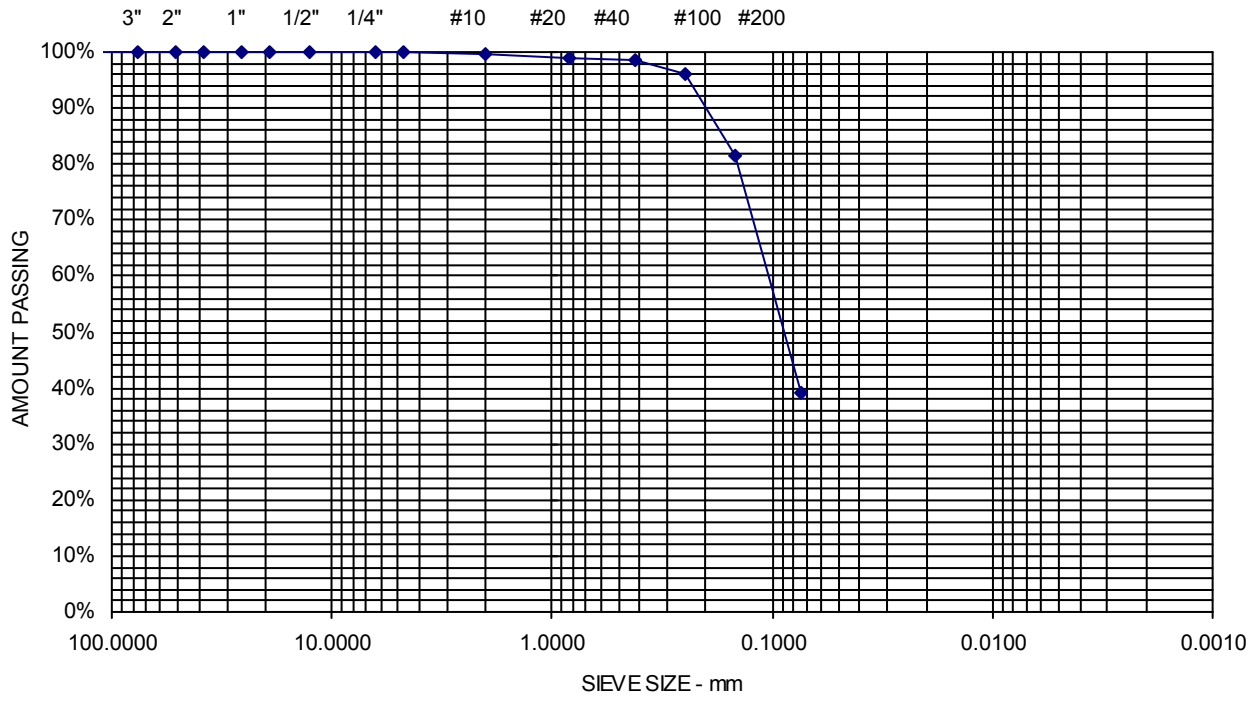
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23285G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1002 10D 50-52**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**99**	
425 um	**No. 40**	**98**	60.9% Sand
250 um	**No. 60**	**96**	
150 um	**No. 100**	**82**	
75 um	**No. 200**	**39.1**	39.1% Fines



Comments: w = 23.1%

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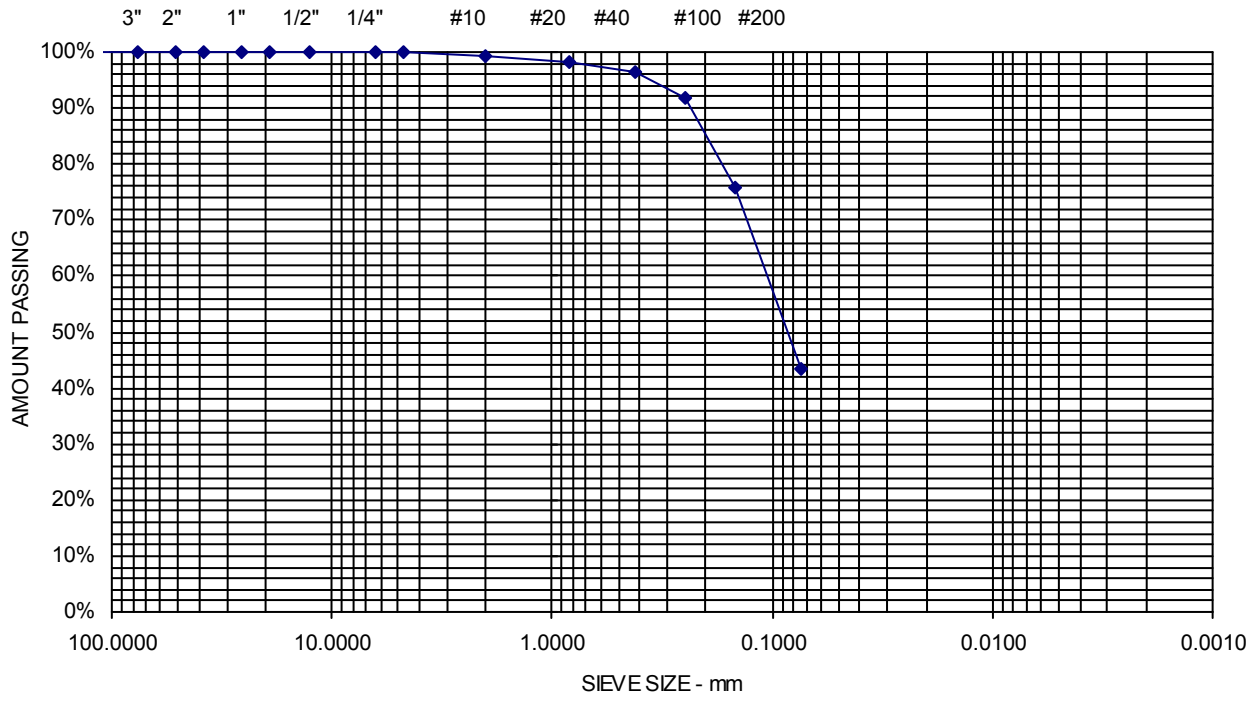
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23288G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1003 8D 65-67**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**98**	
425 um	**No. 40**	**96**	56.5% Sand
250 um	**No. 60**	**92**	
150 um	**No. 100**	**76**	
75 um	**No. 200**	**43.5**	43.5% Fines



Comments: w = 23.6%

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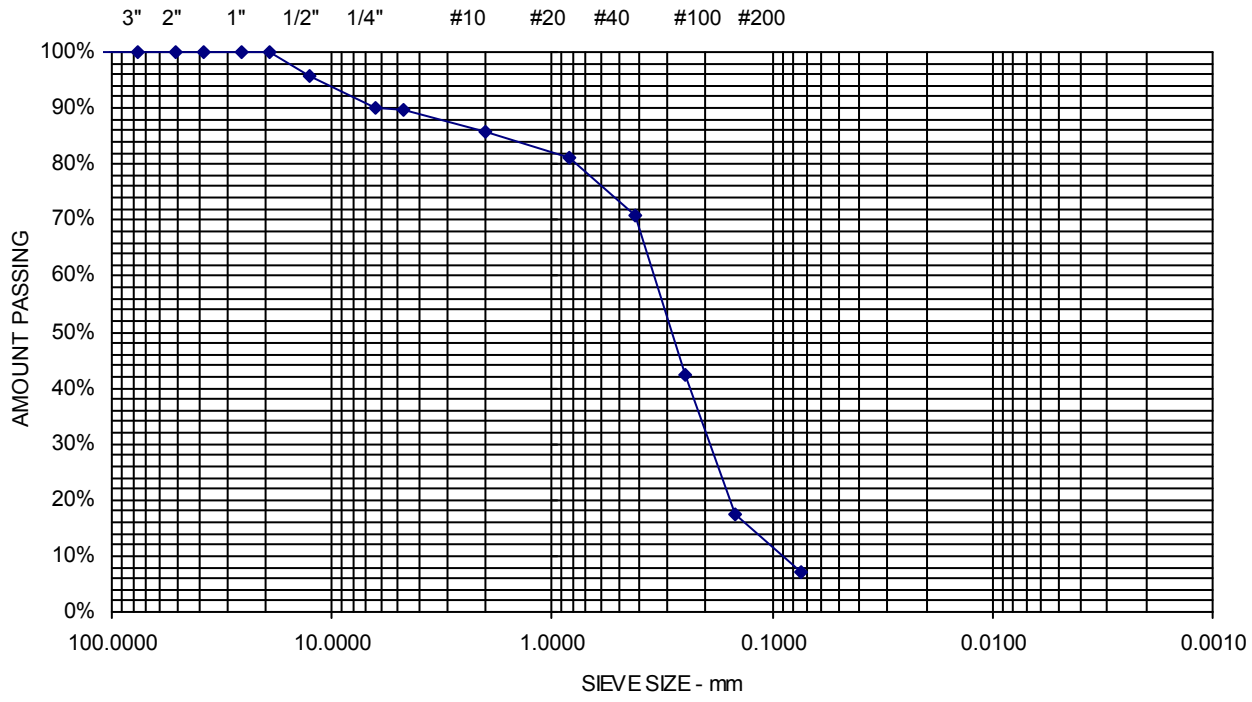
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23289G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1003 9D 70-72**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**96**	
6.3 mm	**1/4"**	**90**	
4.75 mm	**No. 4**	**90**	10.3% Gravel
2.00 mm	**No. 10**	**86**	
850 um	**No. 20**	**81**	
425 um	**No. 40**	**71**	82.7% Sand
250 um	**No. 60**	**42**	
150 um	**No. 100**	**17**	
75 um	**No. 200**	**7.0**	7% Fines



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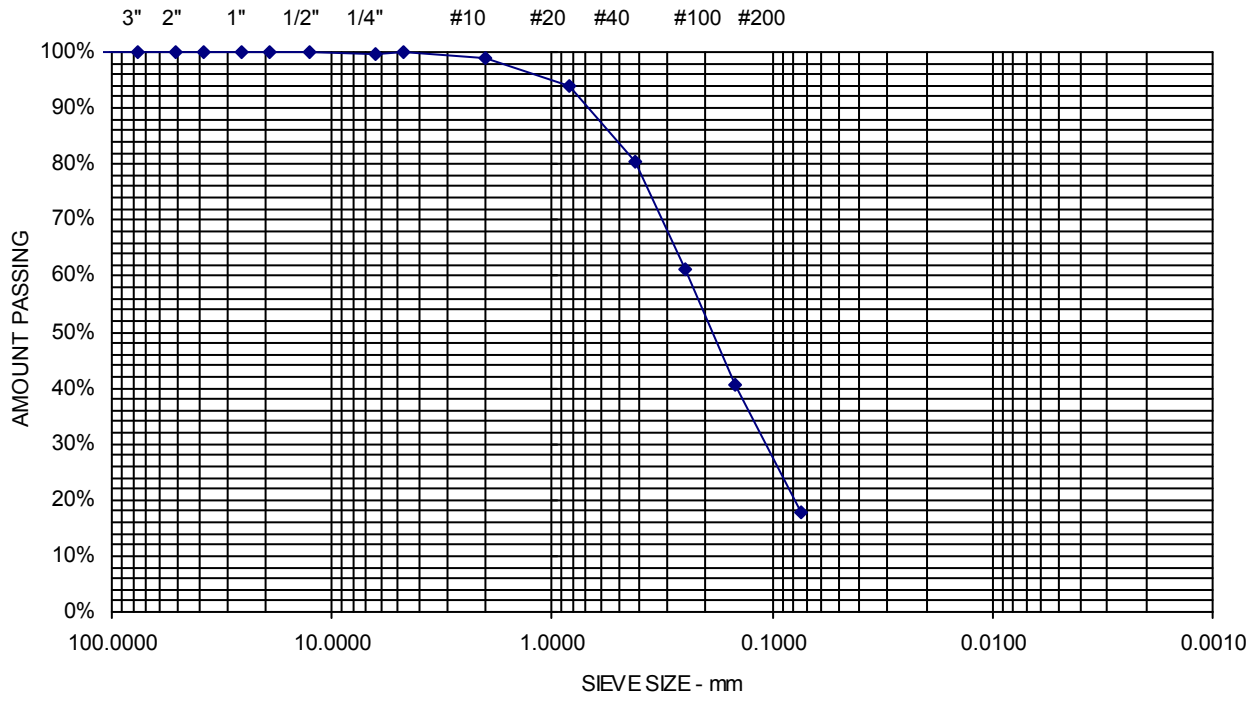
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23290G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1003 10D 80-82**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**94**	
425 um	**No. 40**	**81**	82.2% Sand
250 um	**No. 60**	**61**	
150 um	**No. 100**	**40**	
75 um	**No. 200**	**17.8**	17.8% Fines



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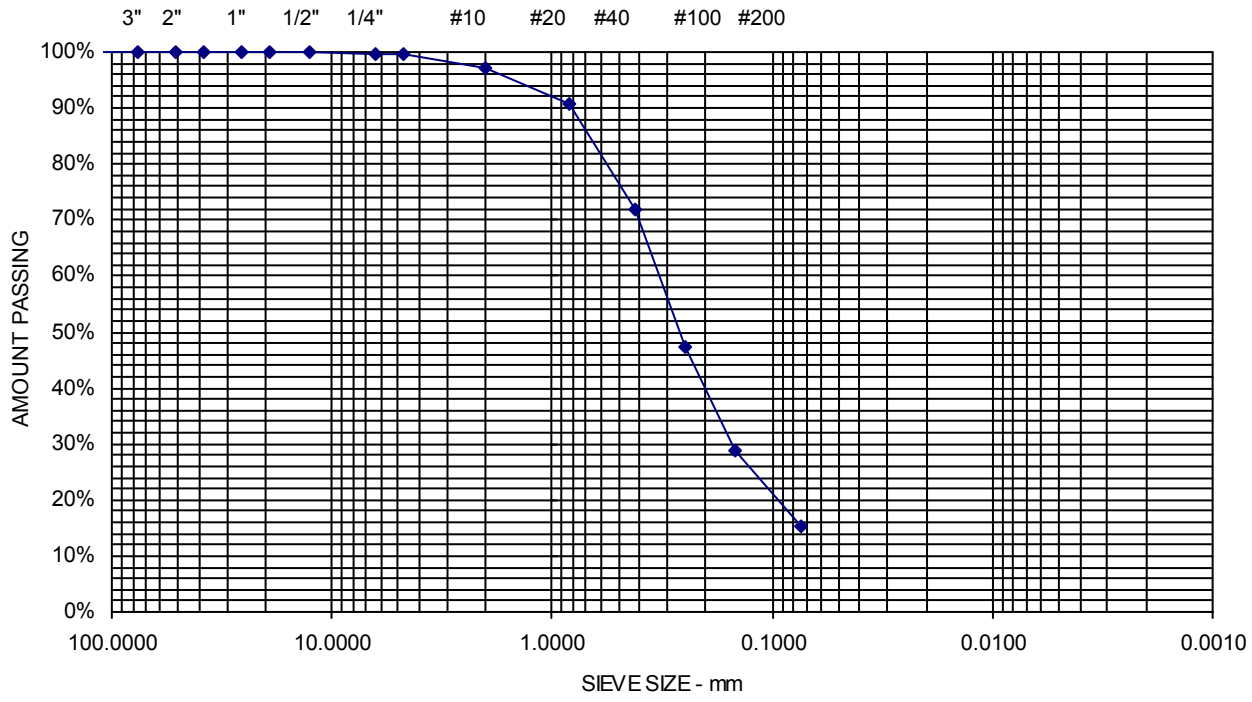
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23293G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1004 7D 60-62**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0.5% Gravel
2.00 mm	**No. 10**	**97**	
850 um	**No. 20**	**91**	
425 um	**No. 40**	**72**	84.2% Sand
250 um	**No. 60**	**47**	
150 um	**No. 100**	**29**	
75 um	**No. 200**	**15.4**	15.4% Fines



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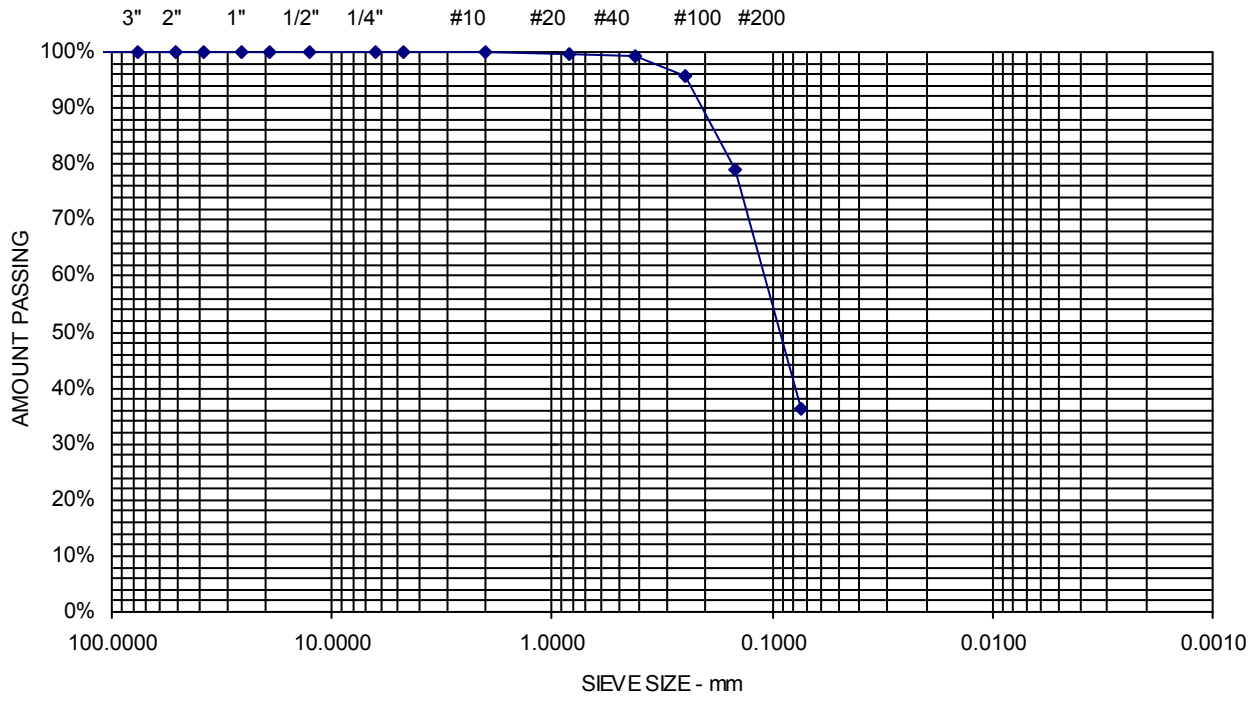
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23294G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1004 9D 70-72**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**99**	63.8% Sand
250 um	**No. 60**	**96**	
150 um	**No. 100**	**79**	
75 um	**No. 200**	**36.2**	36.2% Fines



Comments: w = 21.7%

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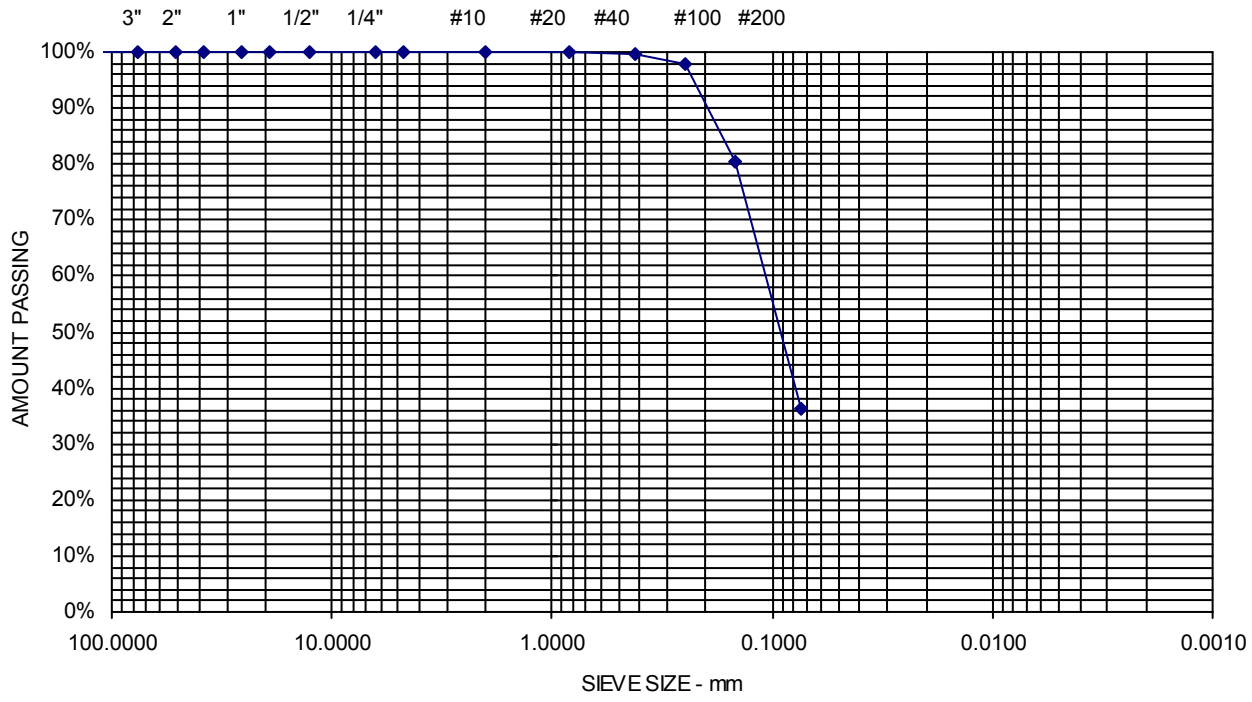
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23295G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1004 10D 80-82**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**100**	63.6% Sand
250 um	**No. 60**	**98**	
150 um	**No. 100**	**80**	
75 um	**No. 200**	**36.4**	36.4% Fines



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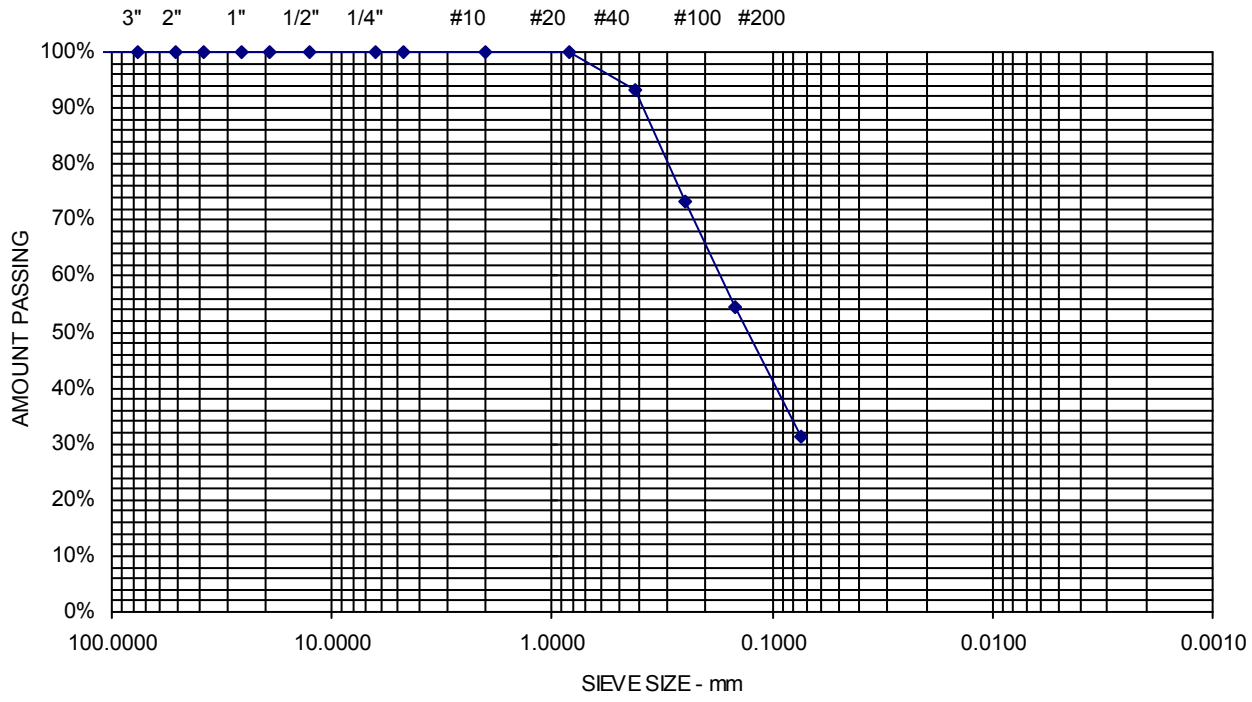
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23298G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1005 8D 60-62**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**93**	68.6% Sand
250 um	**No. 60**	**73**	
150 um	**No. 100**	**55**	
75 um	**No. 200**	**31.4**	31.4% Fines



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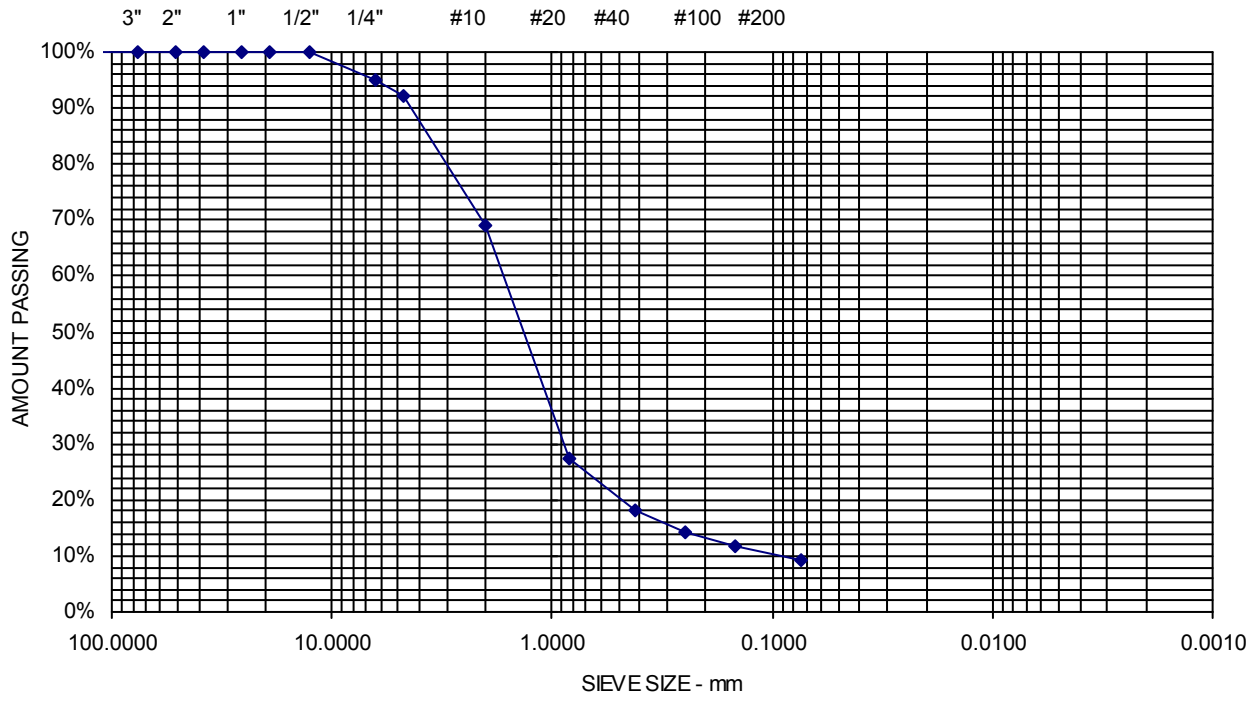
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23299G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1005 10D 70-72**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**95**	
4.75 mm	**No. 4**	**92**	8% Gravel
2.00 mm	**No. 10**	**69**	
850 um	**No. 20**	**27**	
425 um	**No. 40**	**18**	82.8% Sand
250 um	**No. 60**	**14**	
150 um	**No. 100**	**12**	
75 um	**No. 200**	**9.2**	9.2% Fines



Comments: w = 21.1%

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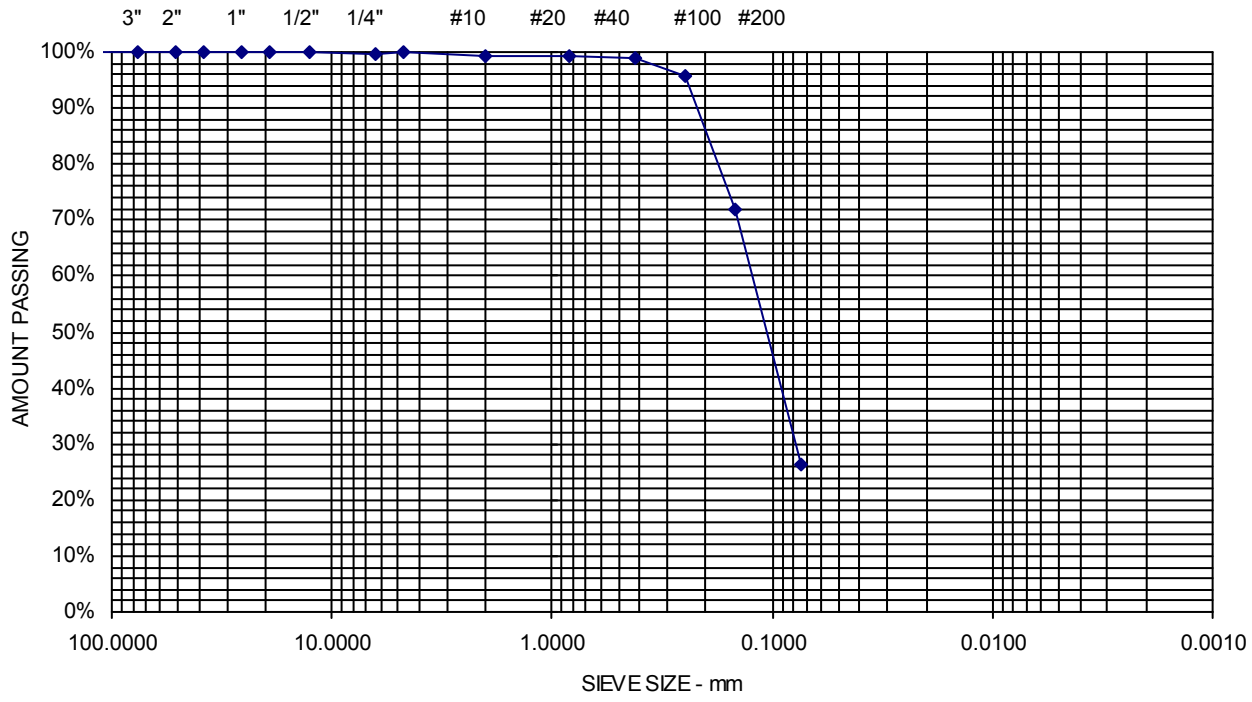
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23300G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1005 11D 80-82**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**99**	
425 um	**No. 40**	**99**	73.6% Sand
250 um	**No. 60**	**96**	
150 um	**No. 100**	**72**	
75 um	**No. 200**	**26.4**	26.4% Fines



Comments: w = 21.0%

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S.W.COLE ENGINEERING, INC.

Consolidation Test

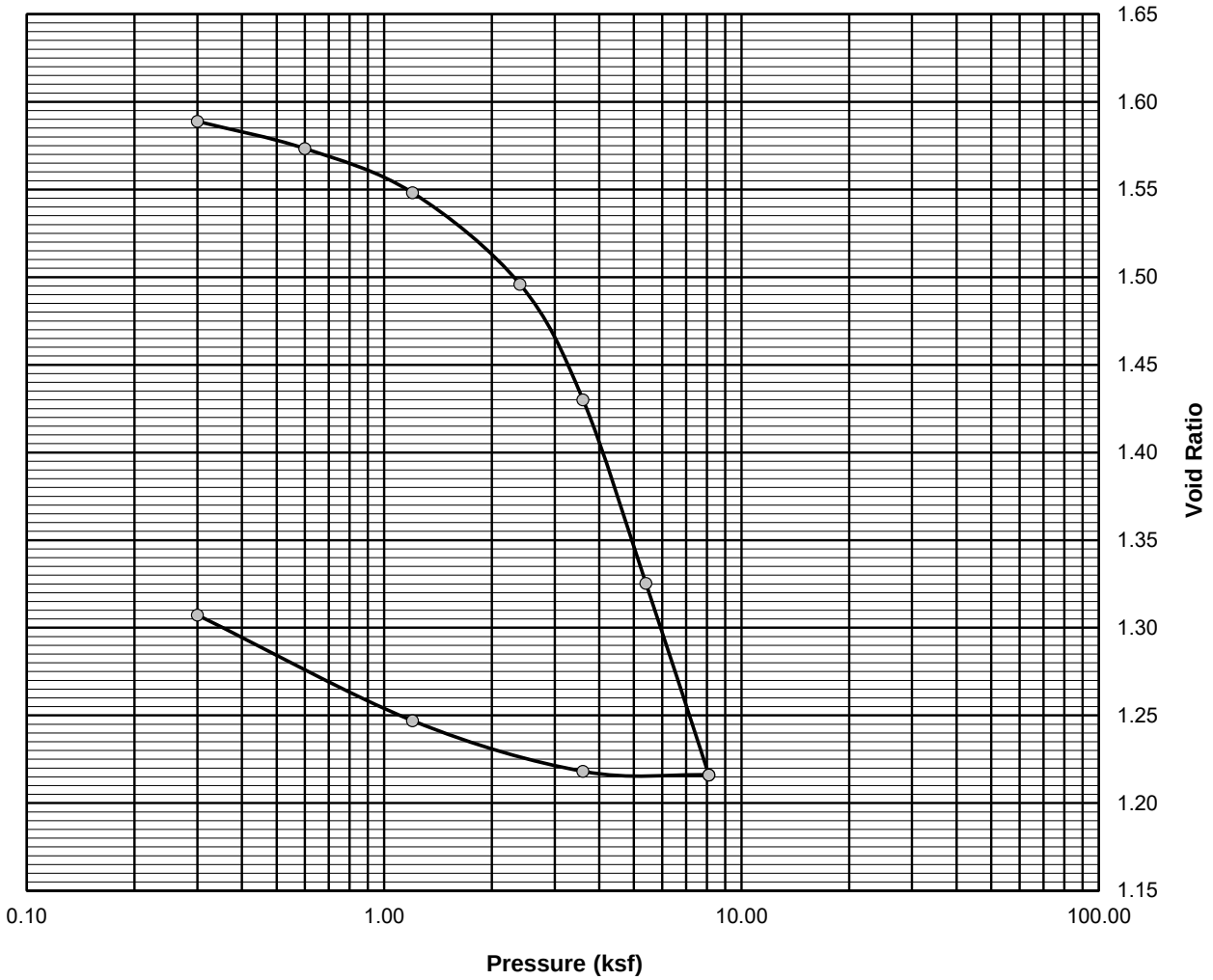
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21264B
Date: 1/30/2018

Boring: B1003
Sample: 1U
Depth: 35-37'

P_C =	2.7	ksf
C_C =	0.61	
C_R =	0.05	
w =	55.2%	
W_L =	55	
W_P =	30	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

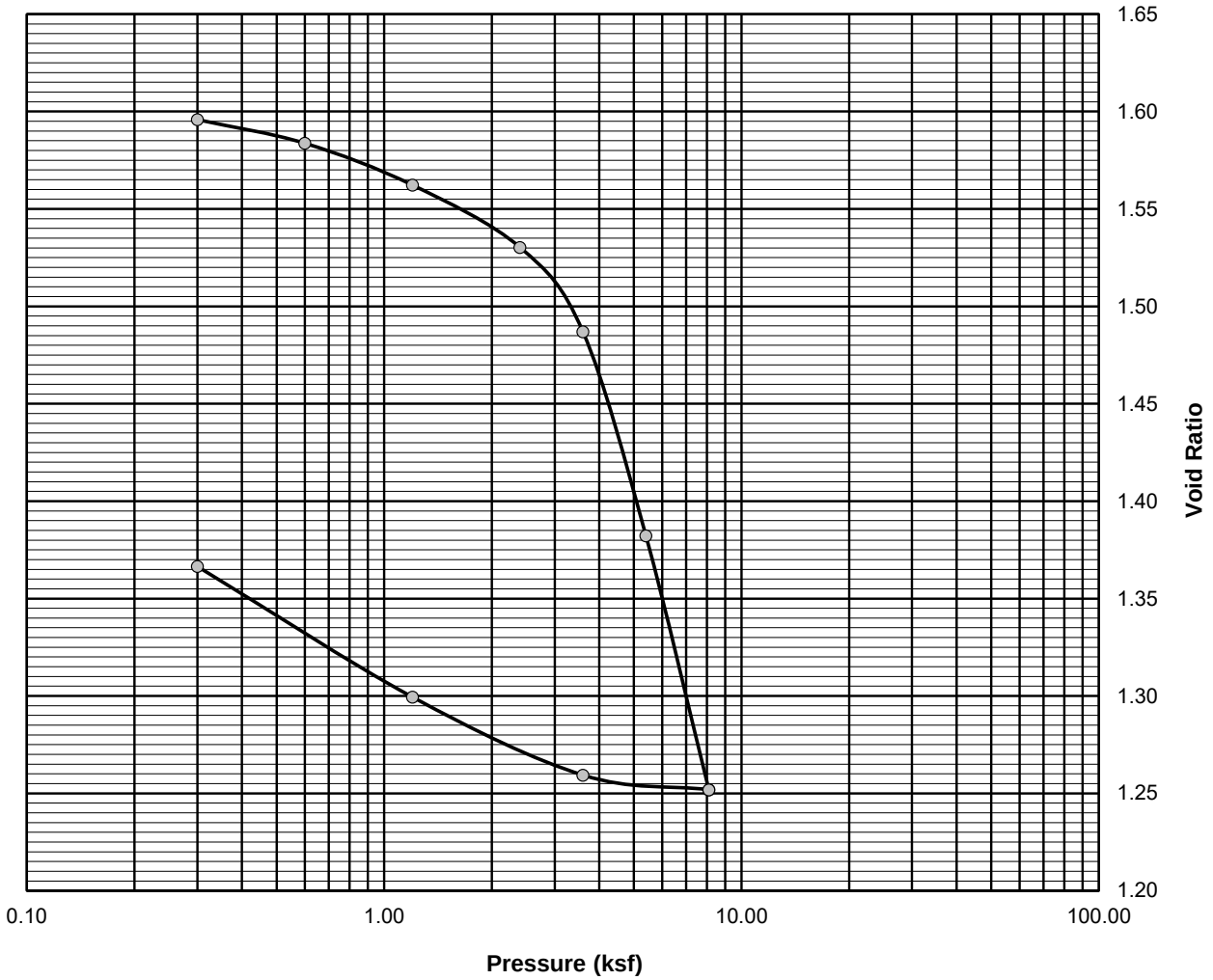
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21265B
Date: 1/30/2018

Boring: B1003
Sample: 2U
Depth: 45-47'

P_C =	3.1	ksf
C_C =	0.67	
C_R =	0.04	
w =	54.7%	
W_L =	48	
W_P =	25	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

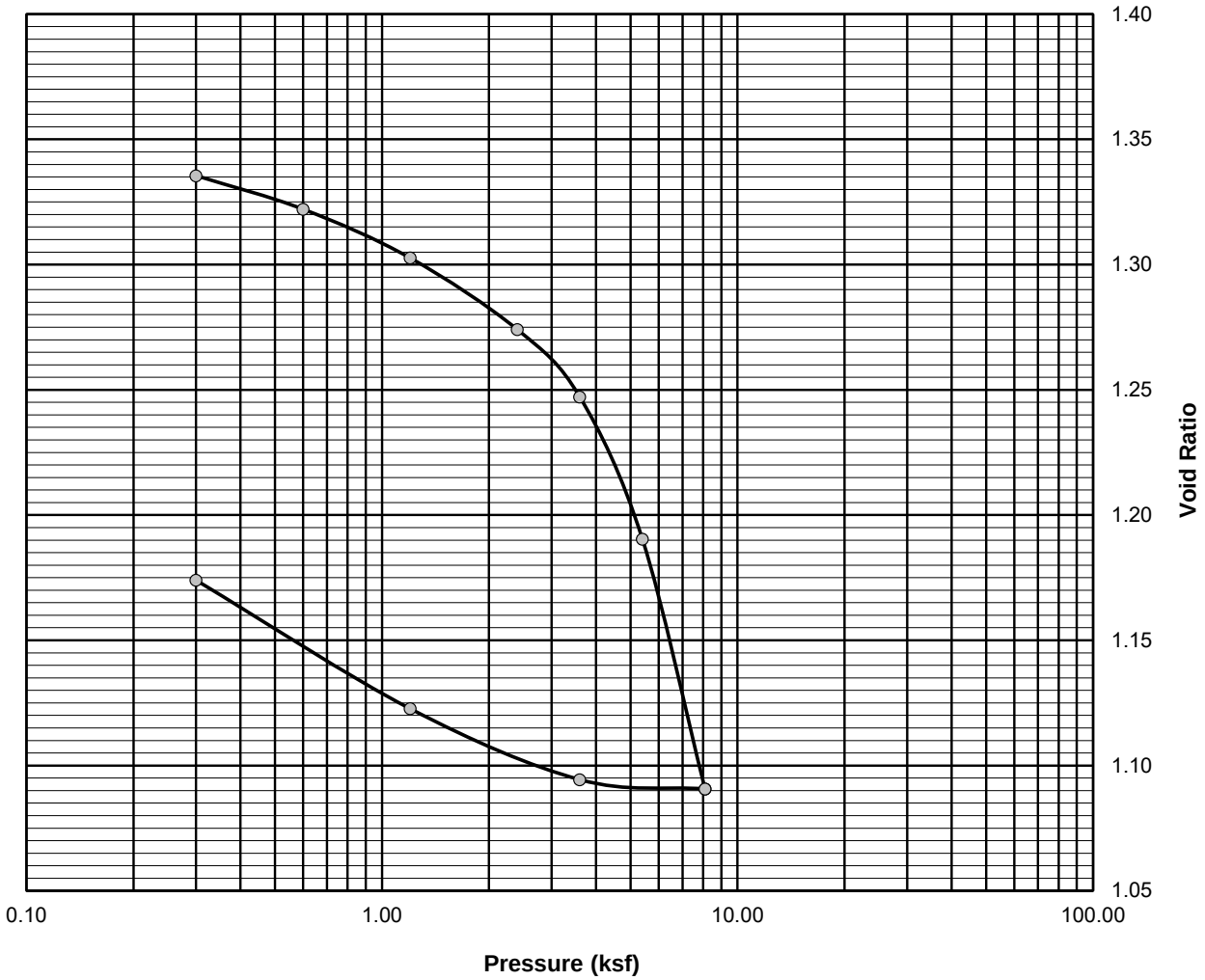
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21266B
Date: 1/30/2018

Boring: B1003
Sample: 3U
Depth: 55-57'

P_C =	4	ksf
C_C =	0.44	
C_R =	0.04	
w =	49.0%	
W_L =	55	
W_P =	27	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

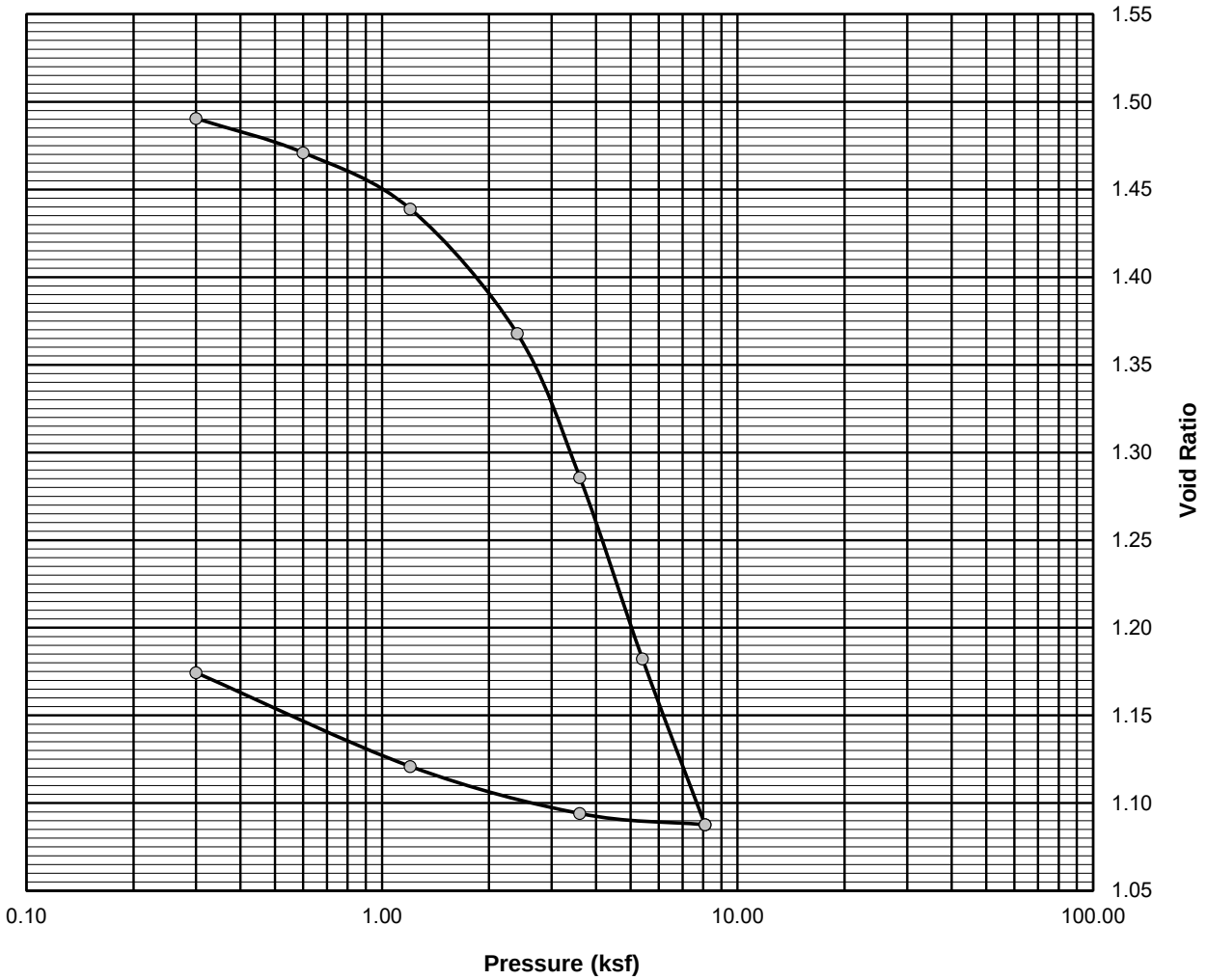
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21267B
Date: 12/29/2017

Boring: B1004
Sample: 1U
Depth: 30-32'

P_C =	2.1	ksf
C_C =	0.56	
C_R =	0.06	
w =	53.4%	
W_L =	47	
W_P =	48	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

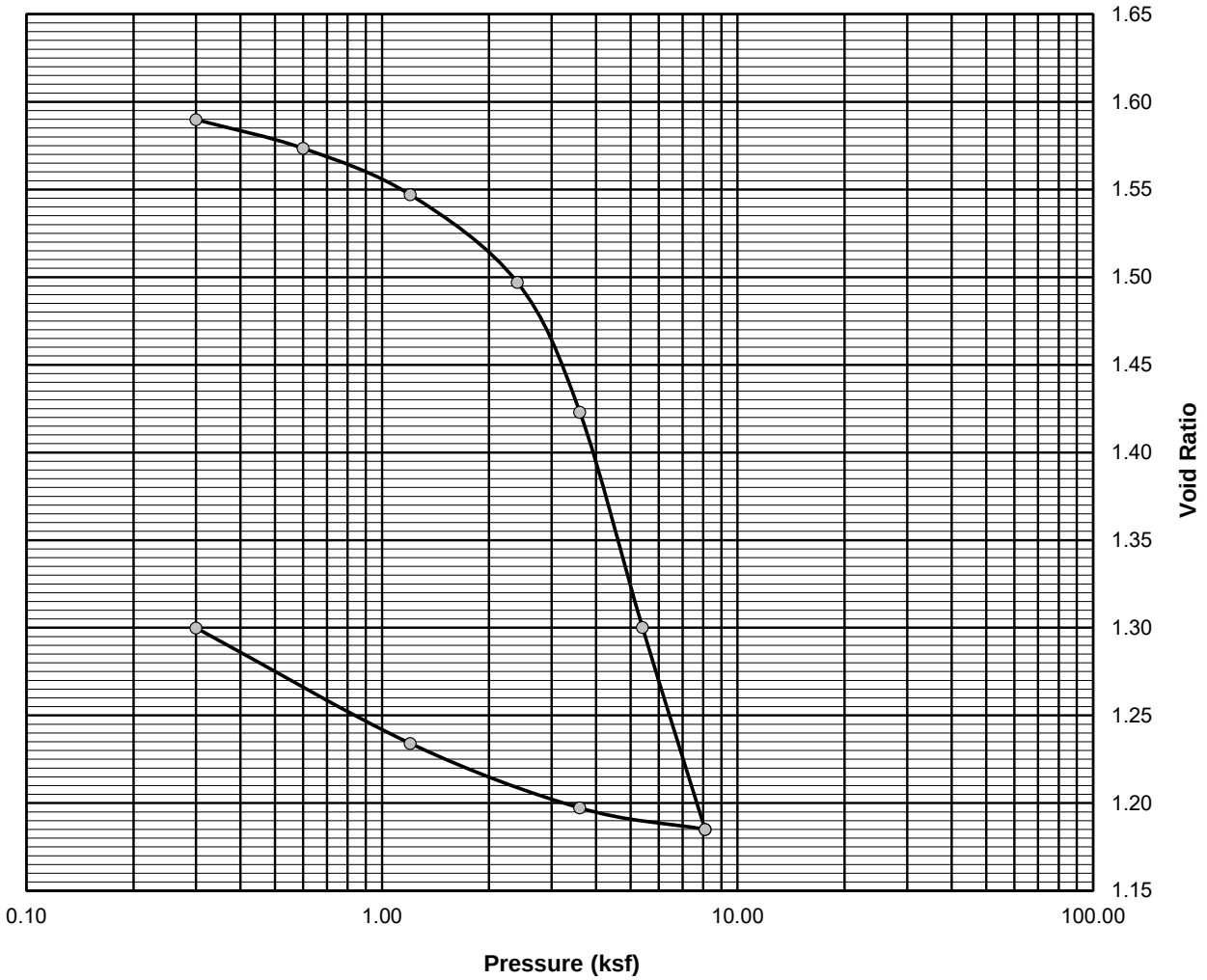
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21268B
Date: 12/29/2017

Boring: B1004
Sample: 2U
Depth: 40-42'

P_C =	2.9	ksf
C_C =	0.68	
C_R =	0.05	
w =	54.6%	
W_L =	53	
W_P =	29	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

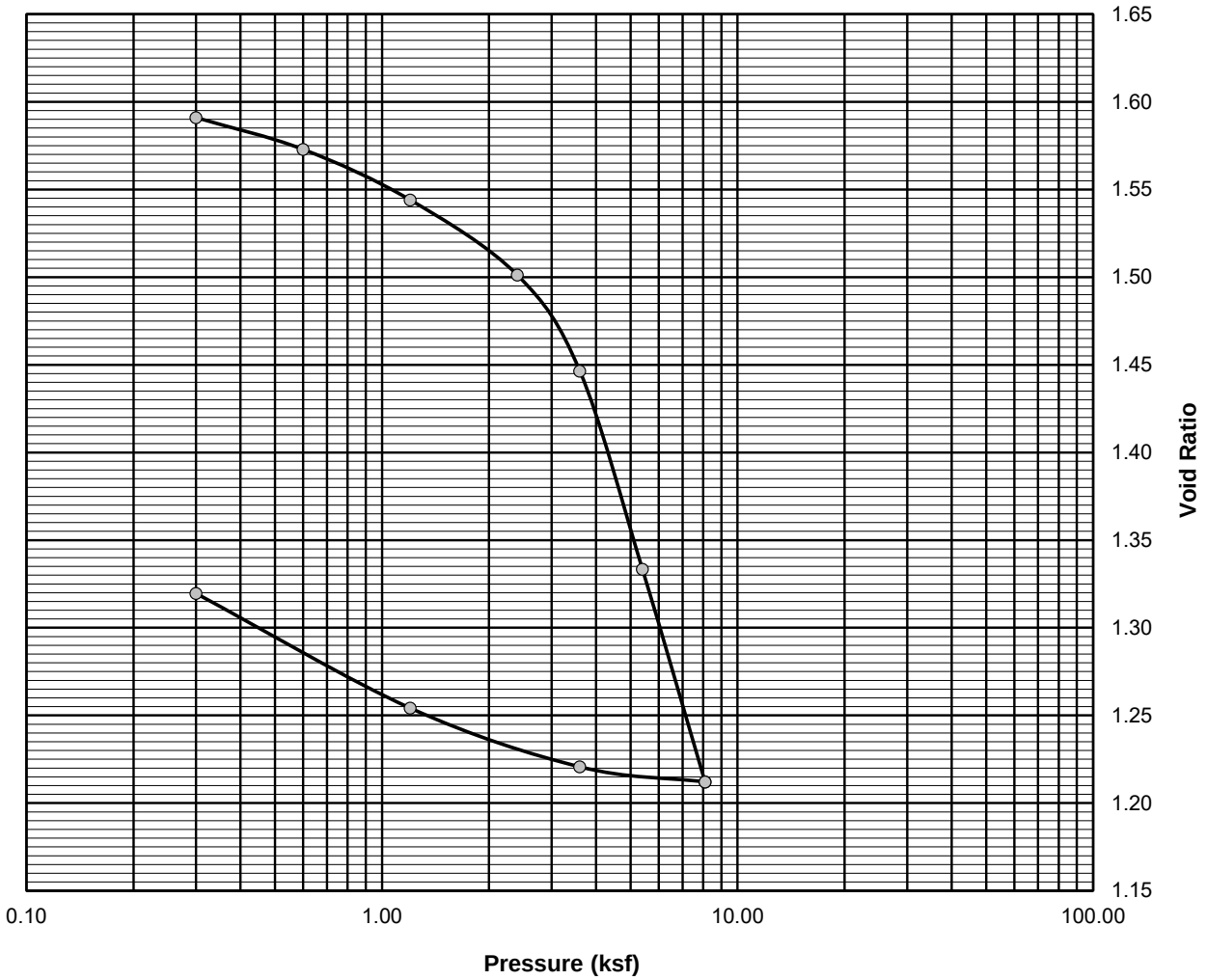
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21269B
Date: 12/29/2017

Boring: B1004
Sample: 3U
Depth: 50-52'

P_C =	3.1	ksf
C_C =	0.67	
C_R =	0.08	
w =	55.4%	
W_L =	55	
W_P =	30	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

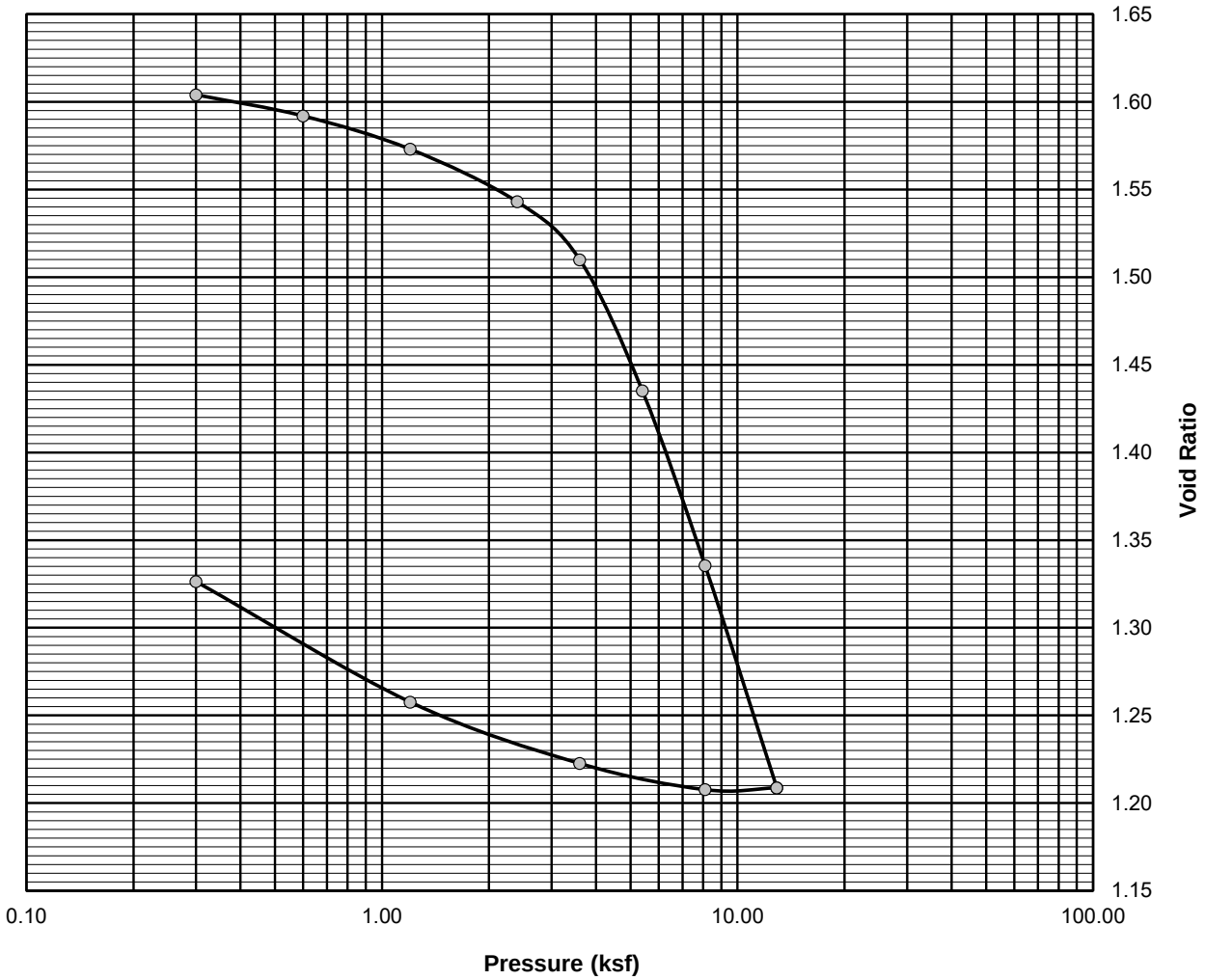
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21270B
Date: 12/29/2017

Boring: B1005
Sample: 1U
Depth: 35-37'

P_C =	3.8	ksf
C_C =	0.60	
C_R =	0.06	
w =	46.5%	
W_L =	49	
W_P =	26	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

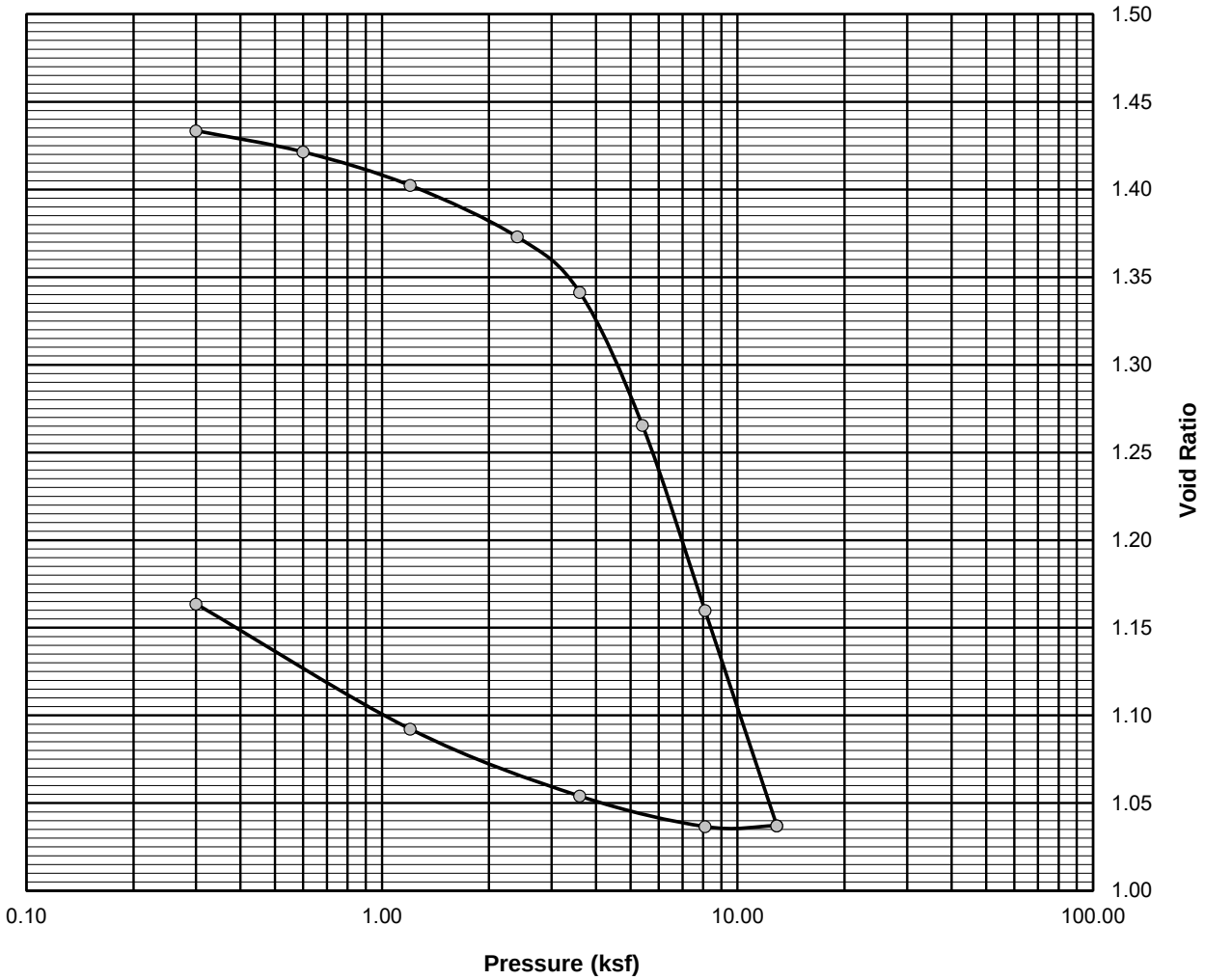
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21271B
Date: 12/29/2017

Boring: B1005
Sample: 2U
Depth: 45-47'

P_C =	4	ksf
C_C =	0.60	
C_R =	0.06	
w =	51.1%	
W_L =	54	
W_P =	29	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

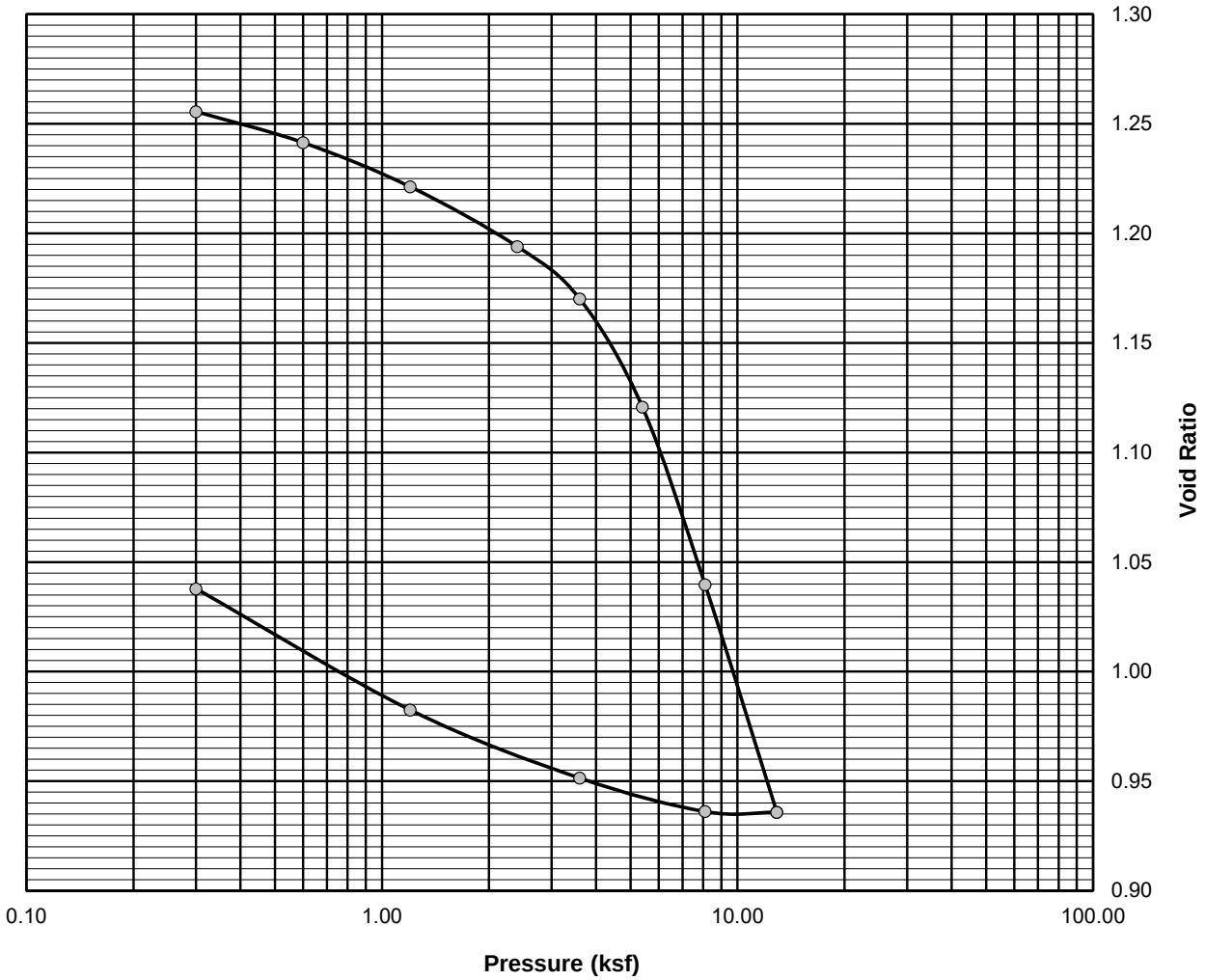
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21272B
Date: 12/29/2017

Boring: B1005
Sample: 3U
Depth: 55-57'

P_C =	4.3	ksf
C_C =	0.51	
C_R =	0.07	
w =	41.2%	
W_L =	43	
W_P =	24	



Comments:

Reviewed By

13. AVAILABILITY & ADEQUACY OF PUBLIC UTILITIES

The proposed development will be serviced by public water, sewer, gas, and electric utilities. Utility connections are described in greater detail in the following sections. The proposed locations of the utility services are shown on the Utility Plan included in the Design Drawings attached to Section 2. The proposed development will also generate waste as a result of construction and post-construction operations.

13.1 WATER

The proposed development will be provided with both fire protection water service and domestic water service as shown on the drawings via an existing water service on the property from the public water main in West Commercial Street. Woodard & Curran is working directly with the Portland Water District (PWD) to determine the appropriate design for this work. An ability to serve request letter was sent to Portland Water District; a copy of this letter is attached to this Section. An ability to serve determination will be provided upon receipt.

13.2 SEWER

The proposed development will be provided with sanitary sewer service from an existing sewer manhole on the property as shown on the drawings. The attached letter was provided to the Portland Department of Public Works to request confirmation of ability to serve the proposed development; the Wastewater Capacity Application was submitted with this letter. A copy of the City's determination will be provided upon receipt.

13.3 GAS

The proposed development will utilize natural gas service provided by Unitil. Proposed infrastructure is shown on the Utility Plan. The location and size of the gas service is being coordinated with Unitil. An ability to serve determination will be provided upon receipt.

13.4 ELECTRIC

Overhead electrical will be provided from a utility pole on West Commercial Street to the project site. Underground electrical services are provided on the project site. Proposed infrastructure is shown on the Utility Plan. The design of the electric service is being coordinated with Central Maine Power (CMP). Final electric layouts will be provided to CMP for their review and an ability to serve determination will be provided upon receipt.

13.5 SOLID WASTE

All solid waste materials and recyclables from the proposed building will be transported and disposed of or recycled in accordance with applicable laws and regulations. Solid waste removal will occur via the loading dock area accessed from the eastern parking lot adjacent to the truck bays.

13.6 CONSTRUCTION & DEMOLITION DEBRIS

The proposed development will generate construction waste and demolition debris (CDD). The Contractor will be responsible for properly disposing of the CDD. The Contractor will be responsible for handling, managing, and disposing of all waste generated by construction in accordance with the Maine Solid Waste Management Regulations and all other applicable local, state, and federal regulations.

13.1 SPECIAL & HAZARDOUS WASTE

Numerous investigations have been completed to evaluate soil, groundwater, and soil vapor conditions at the Site since 1999. In addition, several active remedial efforts have been completed to address known environmental conditions. These activities have been completed in coordination with the Maine DEP VRAP and related Spills & Site

Cleanup programs. Consistent with a Maine DEP VRAP No Action Assurance Letter (NAAL) dated June 1, 2012, the necessary steps that must be taken in order to receive closure and liability protection under the VRAP are summarized below:

1. The existing soil management plan will be revised and submitted to the Maine DEP for review and approval;
2. Any potential soil vapor issues in future on-site structures will either be addressed and characterized with investigation prior to construction or presumptively addressed through installation of vapor collection systems;
3. No potable wells will be installed on the property in the future, and;
4. The property use will remain non-residential use unless other uses are approved by the Maine DEP.

It is anticipated that the Maine DEP VRAP requirements outlined above will be fulfilled as part of the proposed project. Special and hazardous waste encountered during the construction process will be handled, managed and disposed of in accordance with the Maine DEP approved revised soil management plan and all applicable local, state and federal regulations.

13.2 ATTACHMENTS

- Portland Water District Ability to Serve Request Letter
- Portland Department of Public Works Request for Ability to Serve Letter
- City of Portland Wastewater Capacity Application

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

March 2, 2020

MEANS Group
Portland Water District
225 Douglass Street
Portland, ME 04104

Re: Maine International Cold Storage Facility – Request for Evidence of Ability to Serve

To Whom It May Concern:

On behalf of Maine International Cold Storage Facility LLC, Woodard & Curran is submitting this ability to serve request letter for proposed cold storage facility to be located at 40 West Commercial Street in Portland, Maine. The proposed work includes construction of a single story, 108,024 square-foot building, truck loading area, truck and employee parking areas, fire access drive, and associated site and utility improvements. The building will be comprised of roughly 91,000 square feet space for offloading and cold storage, 13,000 square feet of administrative space, and 4,000 square feet of mechanical and utility space. A fixture count spreadsheet is enclosed to assist in determining peak flow for the site. Please note two eyewash stations are proposed, but not included in the fixture count spreadsheet.

The proposed cold storage facility will require one domestic water service and one fire protection service. The proposed design includes utilization of a 130 LF segment of existing water piping for the fire protection service. This existing water pipe currently services a hydrant that will be demolished as part of the proposed project. The domestic water service is proposed to tee off from the existing water service at the site entrance on West Commercial Street. Please refer to the enclosed Utility Plan for location and size of proposed water services.

Upon completion of development, the proposed project is anticipated to require 660 gallons of water per day. This estimate is based on the preliminary design of the interior layout. We do not anticipate changes that would result in significant water usage increases, but will notify the Water District if design development results in any major changes. We intend to submit to the City of Portland Planning Department for approval of the Level III Site Plan application and will appreciate documentation regarding the Portland Water District's ability to serve the proposed development with potable water.

Please let us know if any additional information is required to evaluate the service capacity for the site or if you have any questions on our proposed layout. We appreciate your assistance and look forward to working with you further. Please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) Utility Plan
Fixture Count Spreadsheet

PN: 0232277.00

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

March 2, 2020

ATTN: Bradley Roland, P.E.
Department of Public Works
212 Canco Road
Portland, ME 04103

Re: Maine International Cold Storage Facility – Request for Evidence of Ability to Serve

Dear Mr. Roland:

On behalf of Maine International Cold Storage Facility LLC, Woodard & Curran is submitting this ability to serve request letter for proposed cold storage facility to be located at 40 West Commercial Street in Portland, Maine. The proposed work includes construction of a single story, 108,024 square-foot building, truck loading area, truck and employee parking areas, fire access drive, and associated site and utility improvements. The building will be comprised of roughly 91,000 square feet space for offloading and cold storage, 13,000 square feet of administrative space, and 4,000 square feet of mechanical and utility space. Please refer to the enclosed Utility Plan for location and size of the proposed sewer service.

Upon completion, the proposed project is anticipated to discharge 600 gallons of wastewater per day to an existing sewer manhole on the property for the 42" sewer main along West Commercial Street. This estimate is based on anticipated employees (25 employees at warehouse/office with no showers), as well as truck driver use (100 drivers per day using public restroom). We do not anticipate changes that would result in significant increases but will notify the City if design development results in any major changes. We intend to submit to the City of Portland Planning Department for approval of the Level III Site Plan application and will appreciate documentation regarding the City's ability to collect wastewater from the proposed development.

Please let us know if any additional information is required to evaluate the service capacity for the site. We appreciate your assistance. If you have any questions or require any additional information, please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) Utility Plan
Wastewater Application

PN: 0231886.00

CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Portland Dept. of Public Works -
Water Resources
55 Portland Street,
Portland, Maine 04101-2991

Bradley Roland, P.E.
Water Resources Division
Department of Public Works
55 Portland Street
Portland, ME 04103

Date: **March 2, 2020**

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: **40 West Commercial Street**

Chart Block Lot Number: **059 B00A 1, 2, 5-11**

Proposed Use: **Cold Storage Facility**
Previous Use: **Manufactured/Natural Gas Facility**
Existing Sanitary Flows: **0** GPD
Existing Process Flows: **0** GPD
Description and location of City sewer that is to receive the proposed building sewer lateral.

Fore Street and Spring Street

Site Category		
	Commercial *(see part 4 below)*	**X**
	Industrial *(complete part 5 below)*	
	Governmental	
	Residential	
	Other *(specify)*	

Clearly, indicate the proposed connections, on the submitted plans.

2. Please, Submit Contact Information.

City Planner's Name: **TBD** Phone: _____
Owner/Developer Name: **Maine International Cold Storage Facility, LLC c/o Matthew Dieterich**
Owner/Developer Address: **40 Forest Falls Drive, Suite 2, Yarmouth, Maine 04096**
Phone: **(207) 817-5410** Fax: **N/A** E-mail: **matthew.dieterich@sewall.com**
Engineering Consultant Name: **Woodard & Curran, c/o Darrin Stairs, PE**
Engineering Consultant Address: **41 Hutchins Drive, Portland, ME 04101**
Phone: **(207) 558-3662** Fax: **N/A** E-mail: **dstairs@woodardcurran.com**

Note: Consultants and Developers should allow +/- 15 days, for capacity status, prior to Planning Board Review.

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated: **600 GPD**
Peaking Factor/ Peak Times: _____
Specify the source of design guidelines: *(i.e.__"Handbook of Subsurface Wastewater Disposal in Maine,"*
"Plumbers and Pipe Fitters Calculation Manual," __ Portland Water District Records, __ Other (specify)
Handbook of Subsurface Wastewater Disposal in Maine

Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet.

4. Please, Submit External Grease Interceptor Calculations.

N/A

Total Drainage Fixture Unit (DFU) Values: _____

Size of External Grease Interceptor: _____

Retention Time: _____

Peaking Factor/ Peak Times: _____

Note: In determining your restaurant process water flows, and the size of your external grease interceptor, please use The Uniform Plumbing Code. Note: In determining the retention time, sixty (60) minutes is the minimum retention time. Note: Please submit detailed calculations showing the derivation of your restaurant process water design flows, and please submit detailed calculations showing the derivation of the size of your external grease interceptor, either in the space provided below, or attached, as a separate sheet.

5. Please, Submit Industrial Process Wastewater Flow Calculations

Estimated Industrial Process Wastewater Flows Generated: **N/A** GPD

Do you currently hold Federal or State discharge permits? Yes ____ No **X**

Is the process wastewater termed categorical under CFR 40? Yes ____ No **X**

OSHA Standard Industrial Code (SIC): *(http://www.osha.gov/oshstats/sicser.html)*

Peaking Factor/Peak Process Times: _____

Note: On the submitted plans, please show where the building's domestic sanitary sewer laterals, as well as the building's industrial-commercial process wastewater sewer laterals exits the facility. Also, show where these building sewer laterals enter the city's sewer. Finally, show the location of the wet wells, control manholes, or other access points; and, the locations of filters, strainers, or grease traps.

Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided, or attached, as a separate sheet.

CITY OF PORTLAND
Department of Public Works
Christopher C. Branch, P.E., Director

Date: April 10, 2020

Re: Wastewater Capacity Authorization

Address: 40 West Commercial Street
Applicant: Maine International Cold Storage Facility, LLC

Planner: Christian Roadman

Anticipated Wastewater Flow:

Estimate of Anticipated Design Flows				
Development	Unit Size	Number of Units	Gallons per Day per Unit	Total Gallons per Day
Existing flow to be removed				
Vacant				0
Proposed flow				
Warehouse – Office- Employees at place of employment with no showers	# Employees	25	12 GPD/Employee	300
Public Restroom – Truck Driver Use	# Per User	100	3 GPD/User	300
			Net Change	**+ 600**
*Values based on STATE OF MAINE: SUBSURFACE WASTEWATER DISPOSAL RULES, most recent edition				

Comments:
The Department of Public Works, which includes the Water Resource Division, have reviewed and determined that the downstream sewers from the project address have the capacity to convey the estimated dry weather wastewater flows which will be generated from this development.

Please note that you will be connecting into sewer interceptors owned and managed by the Portland Water District (PWD). This request has been shared with them and special provisions for those connections will be required. Please speak with PWD directly about those connections.

You are reminded that the sewers you are proposing to connect into convey both sanitary and stormwater (Combined Sewer) and therefore a backflow preventer is suggested.

212 Canco Road, Ste B · Portland, ME 04103 · 207-874-8801
cbranch@portlandmaine.gov · www.portlandmaine.gov

If the City can be of further assistance, please contact me at all 874-8840 or brad@portlandmaine.gov

Sincerely,



Bradley A. Roland, P.E.
Senior Project Engineer

14. SUMMARY OF FIRE CODES

The items in the Portland Fire Department Site Review Checklist are addressed as follows:

- Name, address, telephone number of applicant
  - Maine International Cold Storage Facility, LLC, c/o Matthew Dieterich
  - 40 Forest Falls Drive, Suite 2, Yarmouth, Maine 04096
  - (207) 817-5410
- Name, address, telephone number of architect
  - CWS Architects c/o Guy Labrecque
  - 264 US Route One, Suite 100-2A, Scarborough, ME 04074
  - (207) 774-4441
- Proposed uses of any structures [NFPA and IBC classification]
  - The main cooler and dock areas will be considered S-2 Low Hazard Storage while the remaining areas will be considered Business Use spaces (2015 IBC).
- Square footage of all structures [total and per story].
  - The 108,024 square-foot building will be a single-story structure with varying roof heights. The building will be comprised of roughly 91,000 square feet space for offloading and cold storage, 13,000 square feet of administrative space, and 4,000 square feet of mechanical and utility space as shown on the architectural design drawings attached to Section 1.
- Elevations of all structures
  - This information is provided on the attached plan set.
- Proposed fire protection of all structures
  - A one-hour fire barrier separation is expected between uses based upon providing a full sprinkler system within the building.
- Hydrant locations
  - Two existing hydrants exist on the 17.9-acre site. One of the hydrants is located within the proposed building footprint and will be demolished. The other hydrant is located approximately 140 feet north of the northeast of the proposed building by West Commercial Street.
- Water main size and location
  - Existing and proposed watermain locations are shown on the civil design plans attached to Section 1 of this Report.
- Access to all structures [min. 2 sides]
  - As shown on the plan set, a 24-foot wide fire access road is proposed around the building to the west and south along the Fore River, with “knox box” gated accesses located near the passenger car parking areas and the truck parking areas. Emergency vehicles will have access to all four sides of the building.

- A code summary shall be included referencing NFPA 1 and all fire department technical standards.
    - The building will be designed and built to conform with all applicable codes including but not limited to the following:
        1. Federal, State and Local MUBEC codes and regulations.
        2. The International Building Code 2015 (IBC)
        3. The International Energy Conservation Code 2009 (IECC)
        4. ASHREA standards 61.1, 62.2 and 90.1 (2013)
        5. NFPA 1, 2018
        6. NFPA 101 - 2012
        7. NFPA 101 - 2018
        8. NFPA 70 - national electrical code - 2017
        9. NFPA 72 - national fire alarm code - 2019
        10. Maine State Plumbing Code
        11. The National Electrical Code 2014
    - Compliancy approach:
        - The building will be designed based upon a "separated use" methodology.
        - The main cooler and dock areas will be considered S-2 Low Hazard Storage while the remaining areas will be considered Business Use spaces. A 1-hour fire barrier separation is expected between there uses based upon providing a full sprinkler system within the building.
        - A fire alarm system will be incorporated into the design
        - The space configurations and egress will be designed to fall within the following limitations.
        - Business Use/Occupancy: Both IBC and NFPA 101 align with the following
            - Exit Access Travel Distance: 300'
            - Common Path of Travel: 100'
            - Dead End Corridor Length: 50'
        - Low Hazard Storage Use/Occupancy: Both IBC and NFPA 101 align with the following U.N.O.
            - Exit Access Travel Distance: 400'
            - Common Path of Travel: 100'
            - Dead End Corridor Length: 50' (IBC) and 100'(NFPA 101)
    - Height and Area:
        - Proposed Construction Type: Type IIB
        - Maximum Building Height: 75'-0" w/ Sprinkler System (The Zoning Ordinance is 75'-0")
        - Maximum Allowable Building Area (Table 506.2):

S-2, Type IIB: 104,000 s.f.

B, Type IIB: 92,000 s.f.

- Frontage Increase:

  W = 30'-0"

  If = [F/P – 0.25] W/30

  If = [1424/1424 – 0.25] 30/30 =.75

- Allowable Area Calculation: Aa = At + (NS x If)

  S-2: Aa = 104,000 + (26,000 x .75) = 123,500

  B: Aa = 92,000 + (23,000 x .75) = 109,250

  Actual S-2: 90,585 + Actual B: 16,016 = .88 (less than 1)

  Allowable S-2: 123,500 Allowable B: 109,250

The proposed building area conforms to the IBC 2015 allowable area.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

Att. Q

July 31, 2020

Christian Roadman, Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: Maine International Cold Storage Facility Level III Site Plan Submittal
Stormwater Management Report Revisions.

Dear Christian:

Thank you for coordinating the review of the proposed Maine International Cold Storage Facility located at 40 West Commercial Street in Portland, Maine. As site design has advanced since our previous submission on May 18, 2020, several changes have been made to the site that impact the stormwater management design, including modifications to the limit of work and redevelopment area, changes to impervious area from removal of the fire access drive; regrading associated with removal of the fire access drive; reconfiguration of the subsurface R-Tank storage system and treatment device; and modifications to the storm drainage pipe network. Revised design drawings reflecting these changes have been uploaded to Eplan.

Based on the attached revised water quality calculations, the proposed project continues to be required to provide treatment for 60% of the redevelopment area. Approximately 86% of the redevelopment area will be captured and the proposed stormwater management system will treat a volume of stormwater greater than the required water quality volume. Higher pollutant ranking areas will be captured and treated in their entirety (medium use road, medium use parking and flat roof), with exception to the existing driveway at the site entrance and a short segment of paved sidewalk (approx. 420 SF).

Adequate provisions have been made to collect stormwater runoff from the project area via a series of drainage swales, catch basins and area drains, which discharge to an underground R-Tank Storage system designed to store the Water Quality Volume prior to treatment. The R-Tank Storage system was shifted to the east and reconfigured to avoid exceeding maximum cover over the R-Tank modules. Revised water quality calculations, HydroCAD Report, and Drainage Area and Redevelopment Area Figures are attached to this letter.

The proposed StormFilter has been sized to accommodate the water quality flow from 1-inch of runoff over 60% of the drainage area. Larger storm events will bypass the filter cartridges via a separate outlet control structure with an internal weir. Due to reconfiguration of the upgradient R-Tank detention system, we have reached back out to the StormFilter manufacturer for review and approval of the revised design. We will submit their updated design review letter upon receipt.

If you have any questions or require additional information, please do not hesitate to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

Enclosures: Revised Design Drawings (uploaded to Eplan)
Revised Water Quality Calculations
Revised HydroCAD Model
Revised Drainage Area and Redevelopment Area Figures

WOODARD &CURRAN COMMITMENT & INTEGRITY DRIVE RESULTS
41 HUTCHINS DRIVE
PORTLAND, MAINE 04102

CLIENT: Maine International Cold Storage Facility, LLC
PROJECT: Cold Storage Facility
CALCS BY: AL
DATE: 7/27/2020
PROJECT NO.: 232277.00

Redevelopment Treatment Calculations - Per Section 4.C.2.d of the MaineDEP Chapter 500 Rules

Area of Redevelopment (acres) = 7.41

a. Existing Pollutant Impact

Land Use	Pollutant Ranking	Land Area (Ac.)	Impact
High Use Roads/Parking Lot	5	0.00	0.00
Other Roads/Medium Use Parking Lot	4	0.00	0.00
Other Parking Lots/Flat Asphalt Roofs/Industrial Roofs	3	1.84	5.52
Other Roofs/Landscaped Area/Paved Walkway	2	5.57	11.14
Non-grass Landscaping/Stormwater	1	0.00	0.00
Forest/Meadow	0	0.00	0.00
			16.67

b. Proposed Pollutant Impact

Land Use	Pollutant Ranking	Land Area (Ac.)	Impact
High Use Roads/Parking Lot	5	0.00	0.00
Other Roads/Medium Use Parking Lot	4	1.94	7.78
Other Parking Lots/Flat Asphalt Roofs/Industrial Roofs	3	2.47	7.40
Other Roofs/Landscaped Area/Paved Walkway	2	2.42	4.85
Non-grass Landscaping/Stormwater	1	0.58	0.58
Forest/Meadow	0	0.00	0.00
			20.60

c. Existing Impact/Total Redevelopment Acres

2.248

d. Proposed Impact/Total Redevelopment Acres

2.779

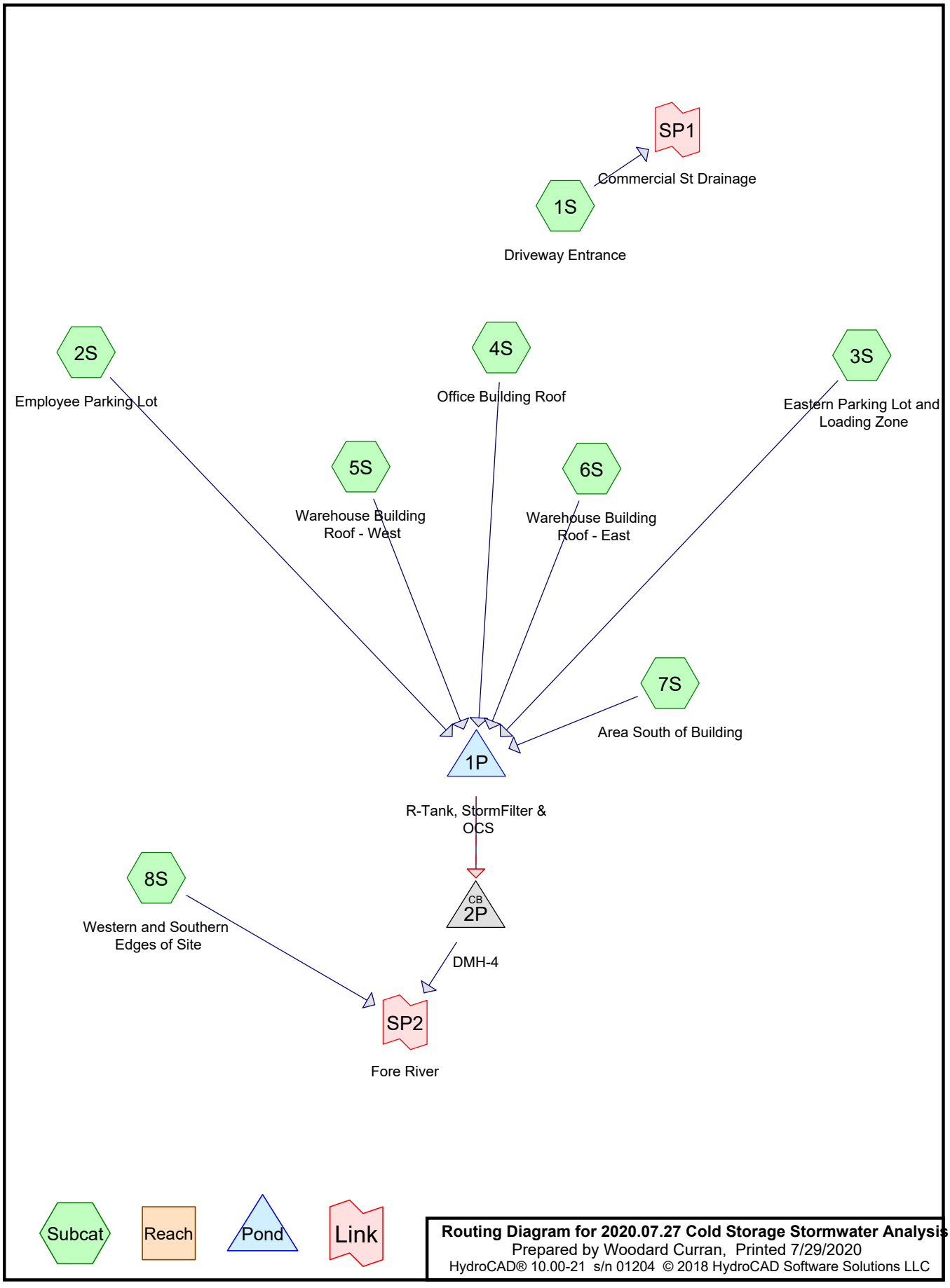
e. Item D Minus Item C

0.53

Ranked Impact Change Due to Redevelopment	Percentage of Developed Area that Must be Treated
0.0 or less	0% (Stormwater projects)
	50% (Site projects)
≥ 0.0 to ≤ 1.0	60%
> 1.0 to ≤ 2.0	70%
> 2.0 to ≤ 3.0	80%
> 3.0	Same treatment level as for new development

Stormwater Treatment Summary	*Treatment Percentage*	*Treated Area (SF)*	*WQV (CF)*
Required	60%	193,736	16,145
Provided	60.5%	278,895	16,286

Treated Area Summary	*System 1*
Impervious Area Treated (SF)	206,940
Landscaped Area Treated (SF)	71,955


SP1
Commercial St Drainage
1S
Driveway Entrance
2S
Employee Parking Lot
4S
Office Building Roof
3S
Eastern Parking Lot and Loading Zone
5S
Warehouse Building Roof - West
6S
Warehouse Building Roof - East
7S
Area South of Building
1P
R-Tank, StormFilter & OCS
8S
Western and Southern Edges of Site
CB
2P
DMH-4
SP2
Fore River
Subcat
Reach
Pond
Link
Routing Diagram for 2020.07.27 Cold Storage Stormwater Analysis
Prepared by Woodard Curran, Printed 7/29/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
156,370	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 7S, 8S)
217,585	98	Impervious (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S)
373,955	**90**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Driveway Entrance Runoff Area=10,610 sf 96.56% Impervious Runoff Depth=2.76"
Tc=6.0 min CN=97 Runoff=0.646 cfs 2,438 cf

Subcatchment2S: Employee Parking Lot Runoff Area=29,100 sf 41.51% Impervious Runoff Depth=1.83"
Tc=6.0 min CN=87 Runoff=1.306 cfs 4,430 cf

Subcatchment3S: Eastern Parking Lot Runoff Area=115,360 sf 73.77% Impervious Runoff Depth=2.35"
Tc=6.0 min CN=93 Runoff=6.386 cfs 22,589 cf

Subcatchment4S: Office Building Roof Runoff Area=17,085 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=1.056 cfs 4,083 cf

Subcatchment5S: Warehouse Building Runoff Area=32,430 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=2.004 cfs 7,750 cf

Subcatchment6S: Warehouse Building Runoff Area=57,870 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=3.575 cfs 13,830 cf

Subcatchment7S: Area South of Building Runoff Area=27,050 sf 8.71% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=82 Runoff=0.976 cfs 3,287 cf

Subcatchment8S: Western and Southern Runoff Area=84,450 sf 0.50% Impervious Runoff Depth=1.33"
Tc=0.0 min CN=80 Runoff=3.185 cfs 9,328 cf

Pond 1P: R-Tank, StormFilter & OCS Peak Elev=4.59' Storage=22,958 cf Inflow=15.300 cfs 55,970 cf
Primary=0.353 cfs 33,085 cf Secondary=8.951 cfs 21,920 cf Outflow=9.273 cfs 55,005 cf

Pond 2P: DMH-4 Peak Elev=1.73' Inflow=9.273 cfs 55,005 cf
36.0" Round Culvert n=0.013 L=61.0' S=0.0051 '/' Outflow=9.273 cfs 55,005 cf

Link SP1: Commercial St Drainage Inflow=0.646 cfs 2,438 cf
Primary=0.646 cfs 2,438 cf

Link SP2: Fore River Inflow=10.196 cfs 64,333 cf
Primary=10.196 cfs 64,333 cf

Total Runoff Area = 373,955 sf Runoff Volume = 67,736 cf Average Runoff Depth = 2.17"
41.82% Pervious = 156,370 sf 58.18% Impervious = 217,585 sf

Summary for Subcatchment 1S: Driveway Entrance

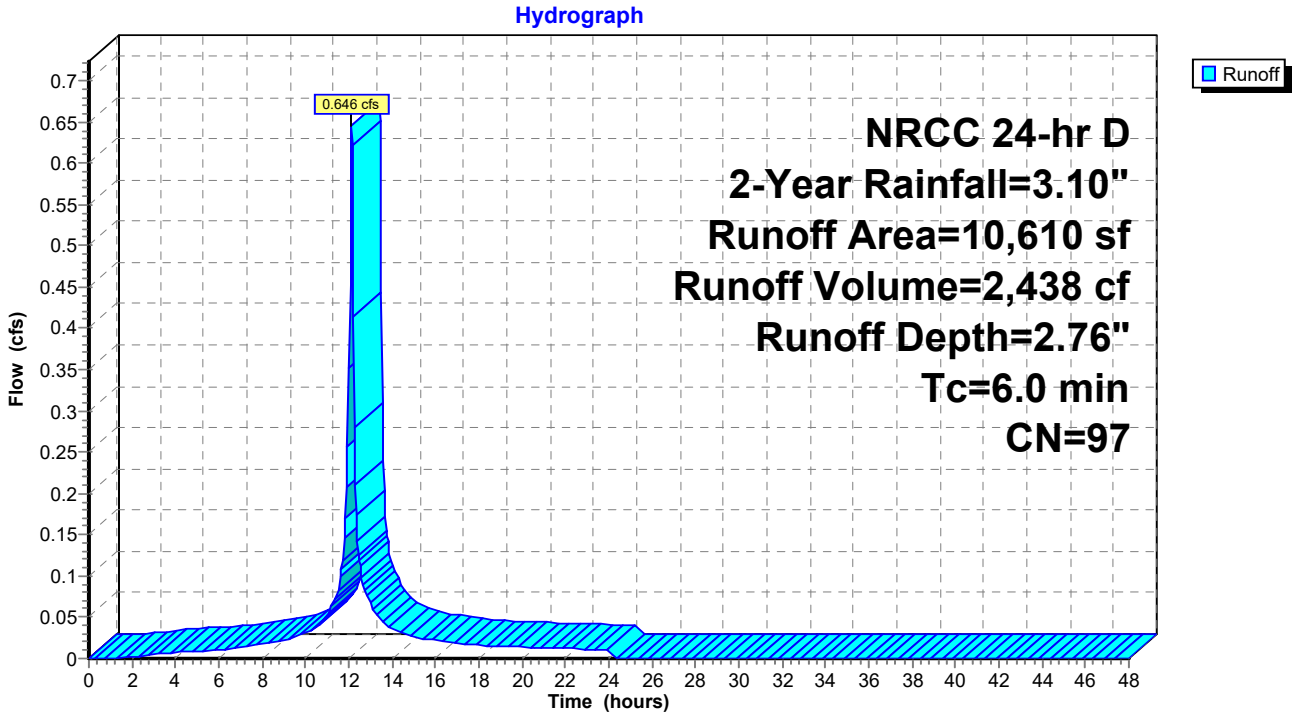
Runoff = 0.646 cfs @ 12.13 hrs, Volume= 2,438 cf, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	10,245	98	Impervious
	365	80	>75% Grass cover, Good, HSG D
	10,610	97	Weighted Average
	365		3.44% Pervious Area
	10,245		96.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1S: Driveway Entrance



Summary for Subcatchment 2S: Employee Parking Lot

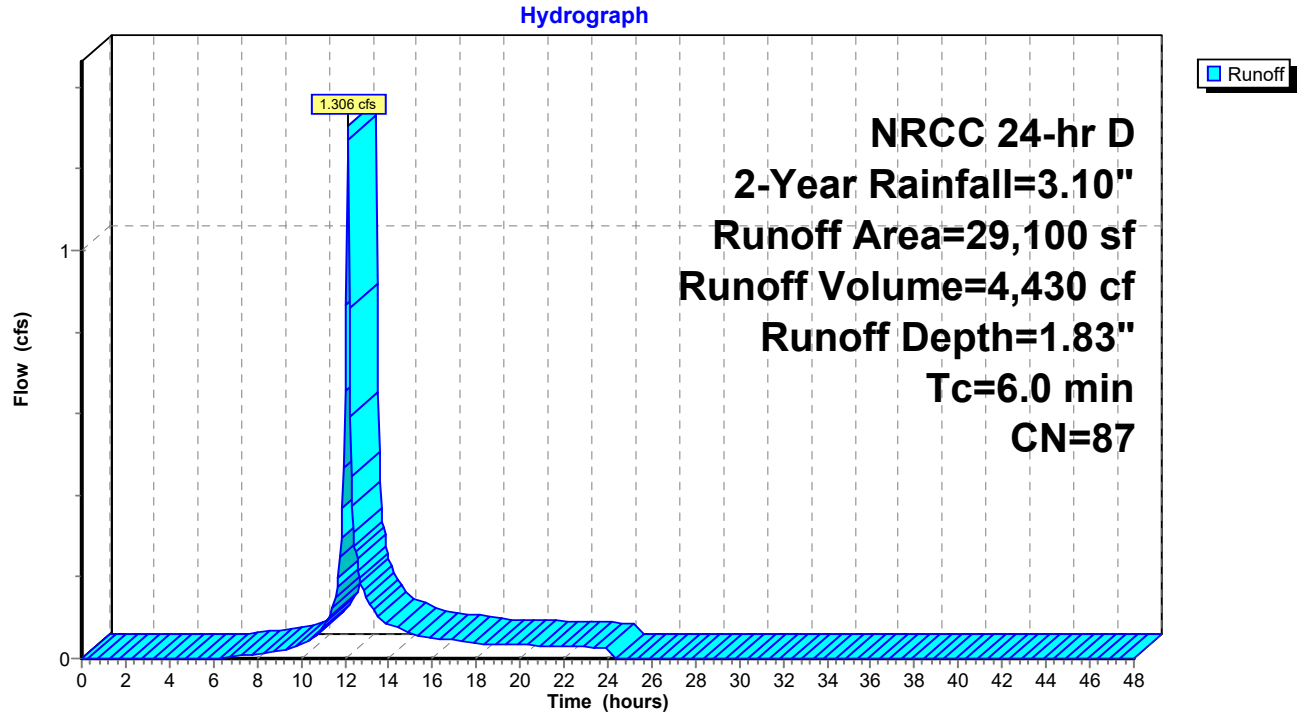
Runoff = 1.306 cfs @ 12.13 hrs, Volume= 4,430 cf, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	12,080	98	Impervious
	17,020	80	>75% Grass cover, Good, HSG D
	29,100	87	Weighted Average
	17,020		58.49% Pervious Area
	12,080		41.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Employee Parking Lot



Summary for Subcatchment 3S: Eastern Parking Lot and Loading Zone

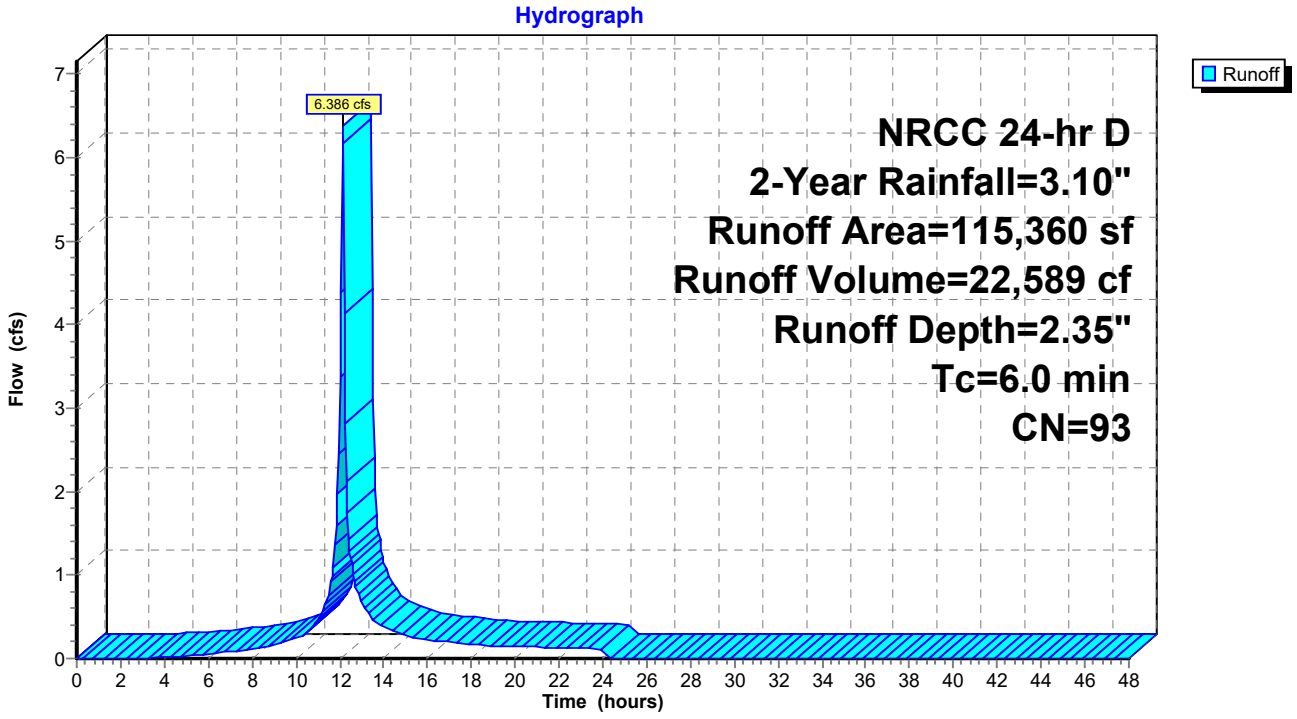
Runoff = 6.386 cfs @ 12.13 hrs, Volume= 22,589 cf, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	85,100	98	Impervious
	30,260	80	>75% Grass cover, Good, HSG D
	115,360	93	Weighted Average
	30,260		26.23% Pervious Area
	85,100		73.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3S: Eastern Parking Lot and Loading Zone



Summary for Subcatchment 4S: Office Building Roof

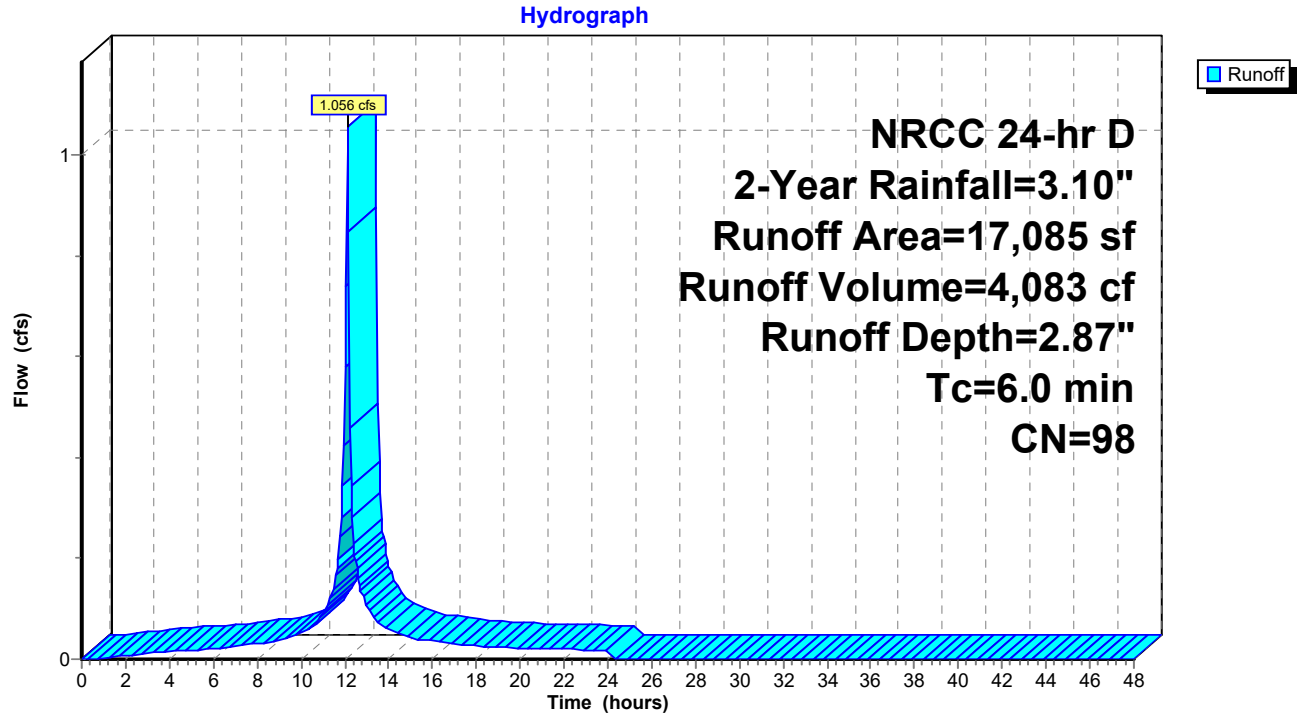
Runoff = 1.056 cfs @ 12.13 hrs, Volume= 4,083 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	17,085	98	Impervious
	17,085		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: Office Building Roof



Summary for Subcatchment 5S: Warehouse Building Roof - West

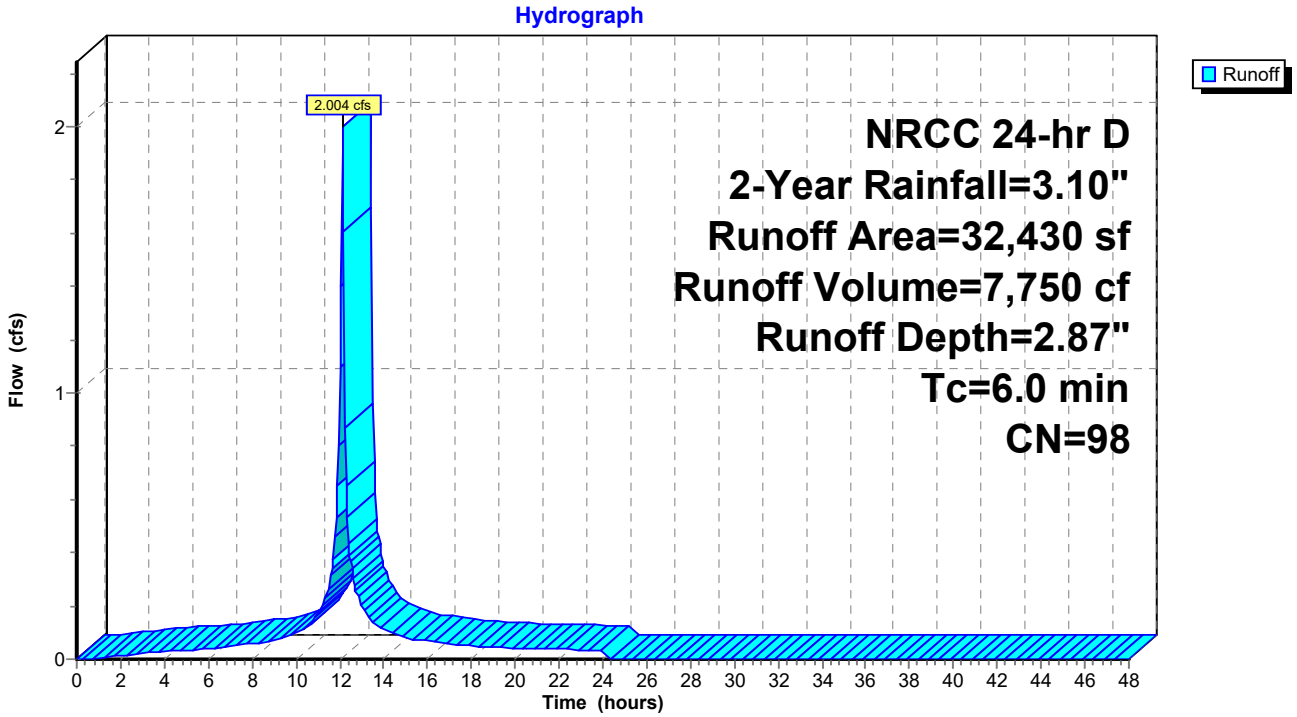
Runoff = 2.004 cfs @ 12.13 hrs, Volume= 7,750 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	32,430	98	Impervious
	32,430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: Warehouse Building Roof - West



Summary for Subcatchment 6S: Warehouse Building Roof - East

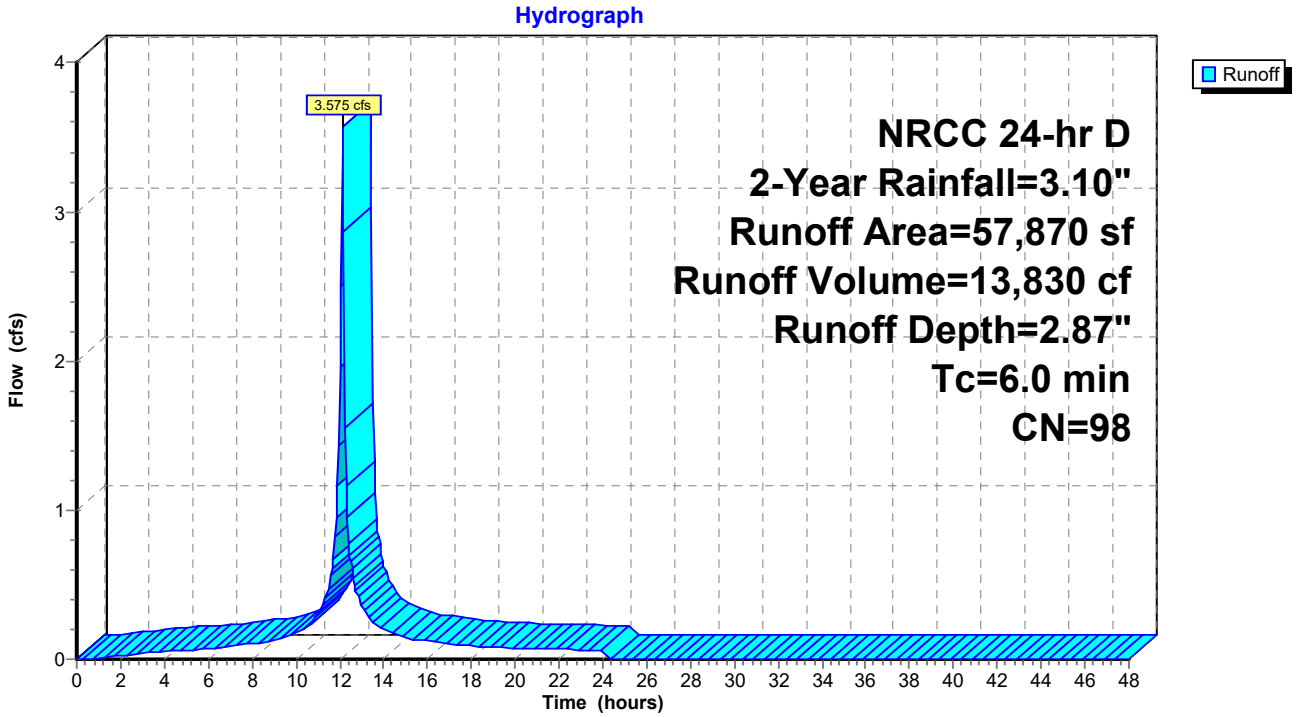
Runoff = 3.575 cfs @ 12.13 hrs, Volume= 13,830 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	57,870	98	Impervious
	57,870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6S: Warehouse Building Roof - East



Summary for Subcatchment 7S: Area South of Building

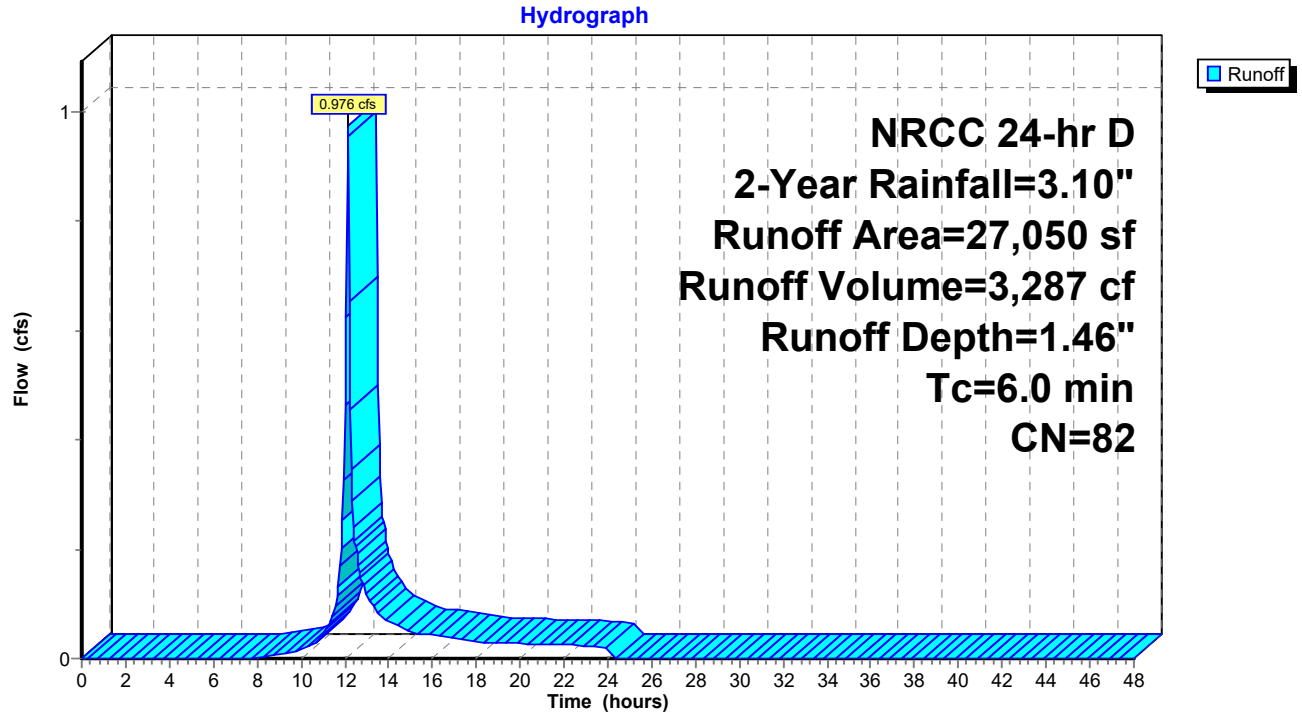
Runoff = 0.976 cfs @ 12.13 hrs, Volume= 3,287 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	2,355	98	Impervious
	24,695	80	>75% Grass cover, Good, HSG D
	27,050	82	Weighted Average
	24,695		91.29% Pervious Area
	2,355		8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 7S: Area South of Building



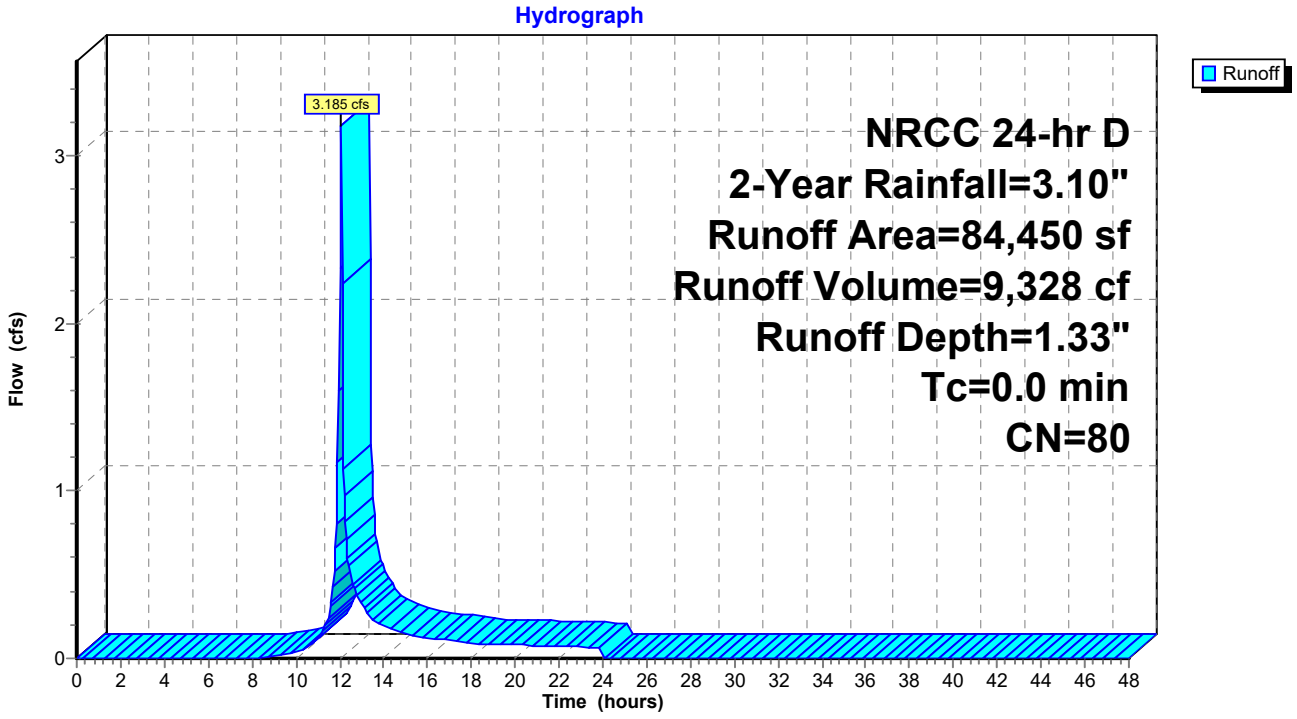
Summary for Subcatchment 8S: Western and Southern Edges of Site

Runoff = 3.185 cfs @ 12.05 hrs, Volume= 9,328 cf, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	420	98	Impervious
	84,030	80	>75% Grass cover, Good, HSG D
	84,450	80	Weighted Average
	84,030		99.50% Pervious Area
	420		0.50% Impervious Area

Subcatchment 8S: Western and Southern Edges of Site



Summary for Pond 1P: R-Tank, StormFilter & OCS

Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth = 2.41" for 2-Year event
Inflow = 15.300 cfs @ 12.13 hrs, Volume= 55,970 cf
Outflow = 9.273 cfs @ 12.22 hrs, Volume= 55,005 cf, Atten= 39%, Lag= 5.4 min
Primary = 0.353 cfs @ 12.11 hrs, Volume= 33,085 cf
Secondary = 8.951 cfs @ 12.22 hrs, Volume= 21,920 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 4.59' @ 12.22 hrs Surf.Area= 7,194 sf Storage= 22,958 cf
Flood Elev= 9.52' Surf.Area= 7,194 sf Storage= 30,079 cf

Plug-Flow detention time= 434.8 min calculated for 55,005 cf (98% of inflow)
Center-of-Mass det. time= 423.9 min (1,216.1 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1	0.81'	5,213 cf	**Stone Envelope (Prismatic)** Listed below (Recalc) 39,207 cf Overall - 26,174 cf Embedded = 13,033 cf x 40.0% Voids
#2	1.06'	24,866 cf	**R-Tank Triple Modules (Prismatic)** Listed below (Recalc) Inside #1 26,174 cf Overall x 95.0% Voids
		30,079 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.81	7,194	0	0
6.26	7,194	39,207	39,207

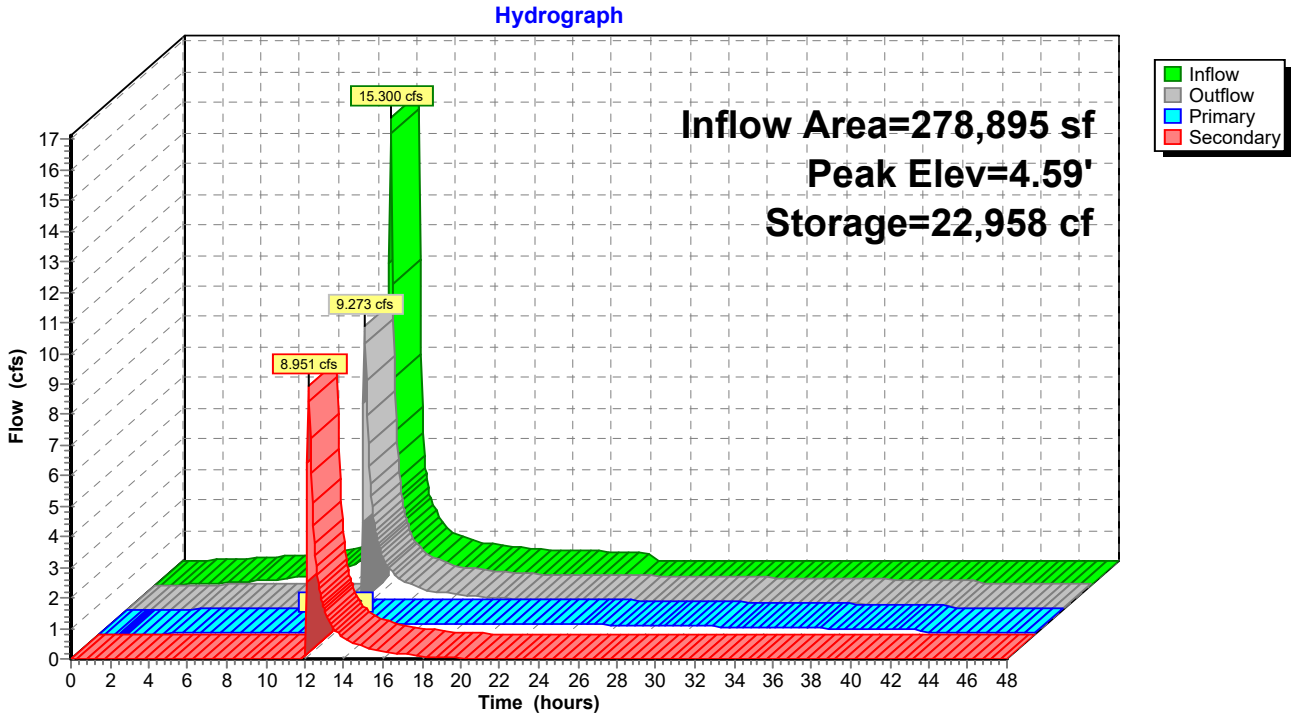
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.06	6,232	0	0
5.26	6,232	26,174	26,174

Device	Routing	Invert	Outlet Devices
#1	Primary	0.56'	**12.0" Round Culvert to DMH4** L= 4.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.56' / 0.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	0.56'	**SF - Tube/Siphon/Float Valve X 28.00** Starts@3.31' Breaks@1.23' 0.504" Diameter, C= 0.600, 0.263" Trickle Diameter
#3	Secondary	1.06'	**30.0" Round Bypass Culvert** L= 6.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1.06' / 0.85' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#4	Device 3	3.81'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.329 cfs @ 12.11 hrs HW=4.20' TW=1.10' (Dynamic Tailwater)
└─**1=Culvert to DMH4** (Passes 0.329 cfs of 5.256 cfs potential flow)
└─**2=SF - Tube/Siphon/Float Valve** (Orifice Controls 0.329 cfs @ 8.48 fps)

Secondary OutFlow Max=8.635 cfs @ 12.22 hrs HW=4.57' TW=1.70' (Dynamic Tailwater)
└─**3=Bypass Culvert** (Passes 8.635 cfs of 28.053 cfs potential flow)
└─**4=Broad-Crested Rectangular Weir** (Weir Controls 8.635 cfs @ 2.84 fps)

Pond 1P: R-Tank, StormFilter & OCS



Summary for Pond 2P: DMH-4

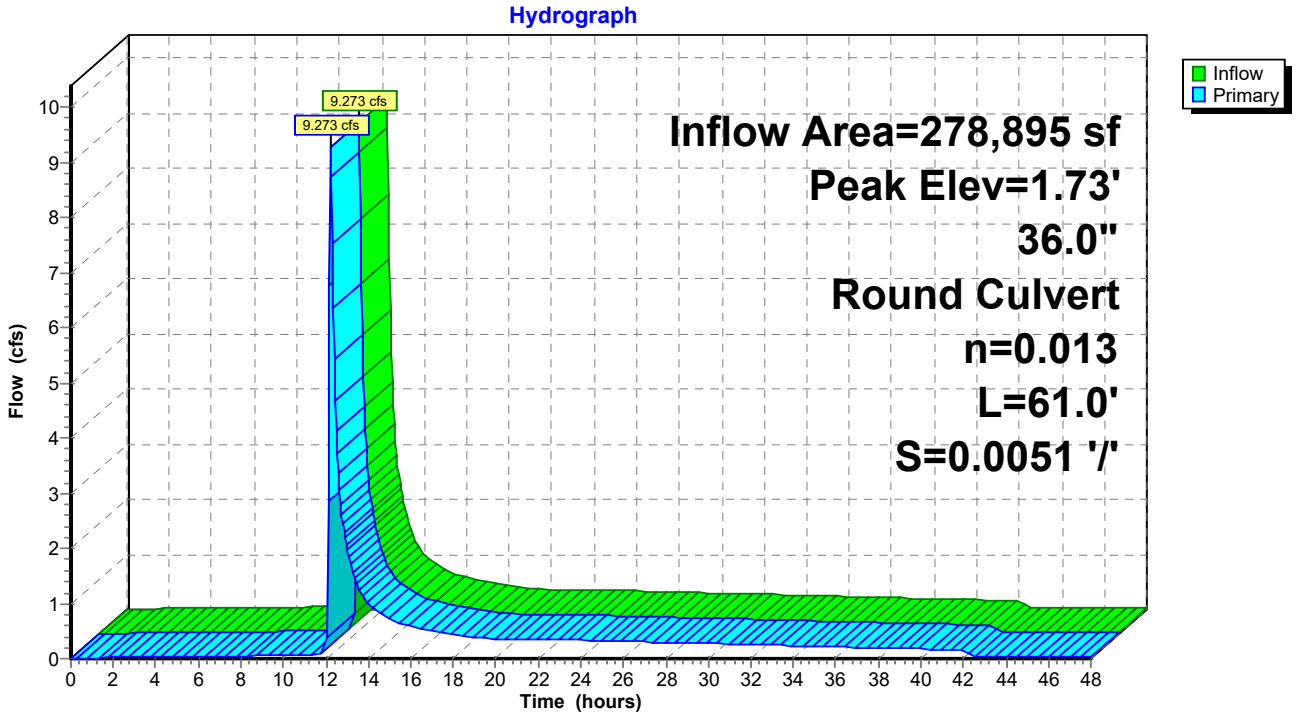
Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth > 2.37" for 2-Year event
Inflow = 9.273 cfs @ 12.22 hrs, Volume= 55,005 cf
Outflow = 9.273 cfs @ 12.22 hrs, Volume= 55,005 cf, Atten= 0%, Lag= 0.0 min
Primary = 9.273 cfs @ 12.22 hrs, Volume= 55,005 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1.73' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.31'	**36.0" Round Culvert** L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.31' / 0.00' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=8.960 cfs @ 12.22 hrs HW=1.70' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 8.960 cfs @ 4.10 fps)

Pond 2P: DMH-4

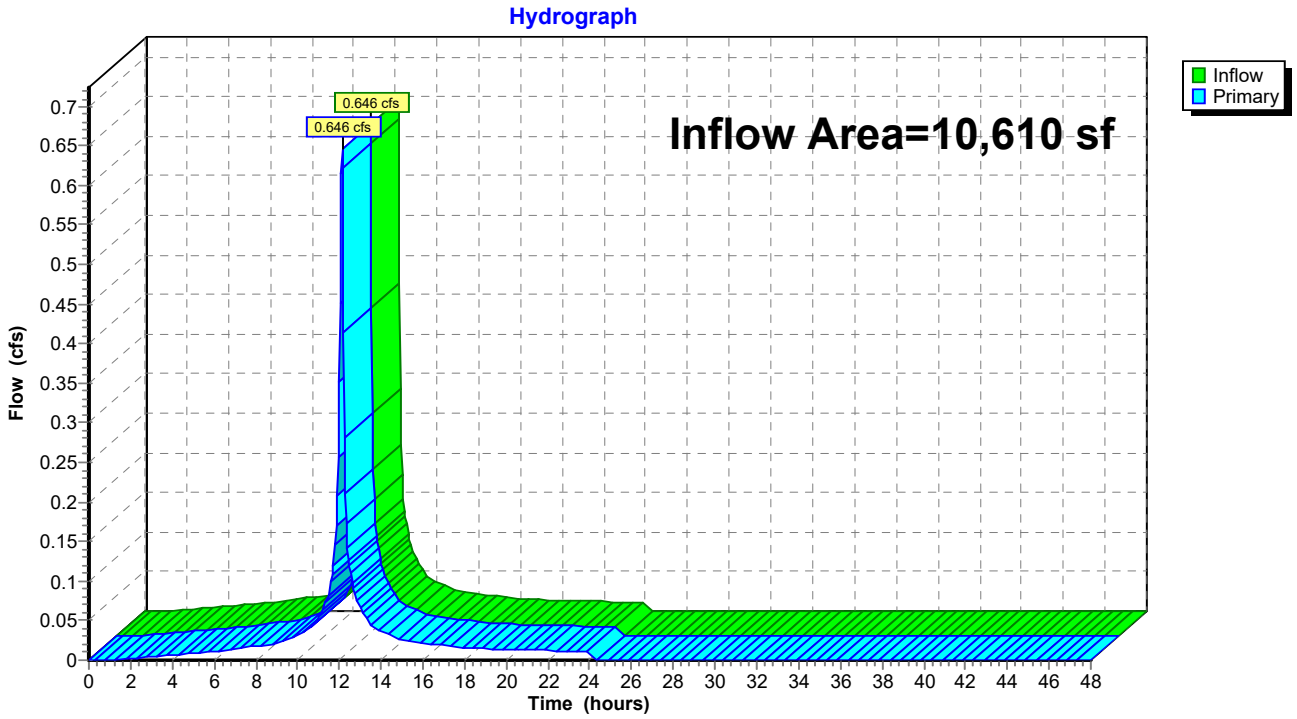


Summary for Link SP1: Commercial St Drainage

Inflow Area = 10,610 sf, 96.56% Impervious, Inflow Depth = 2.76" for 2-Year event
Inflow = 0.646 cfs @ 12.13 hrs, Volume= 2,438 cf
Primary = 0.646 cfs @ 12.13 hrs, Volume= 2,438 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP1: Commercial St Drainage

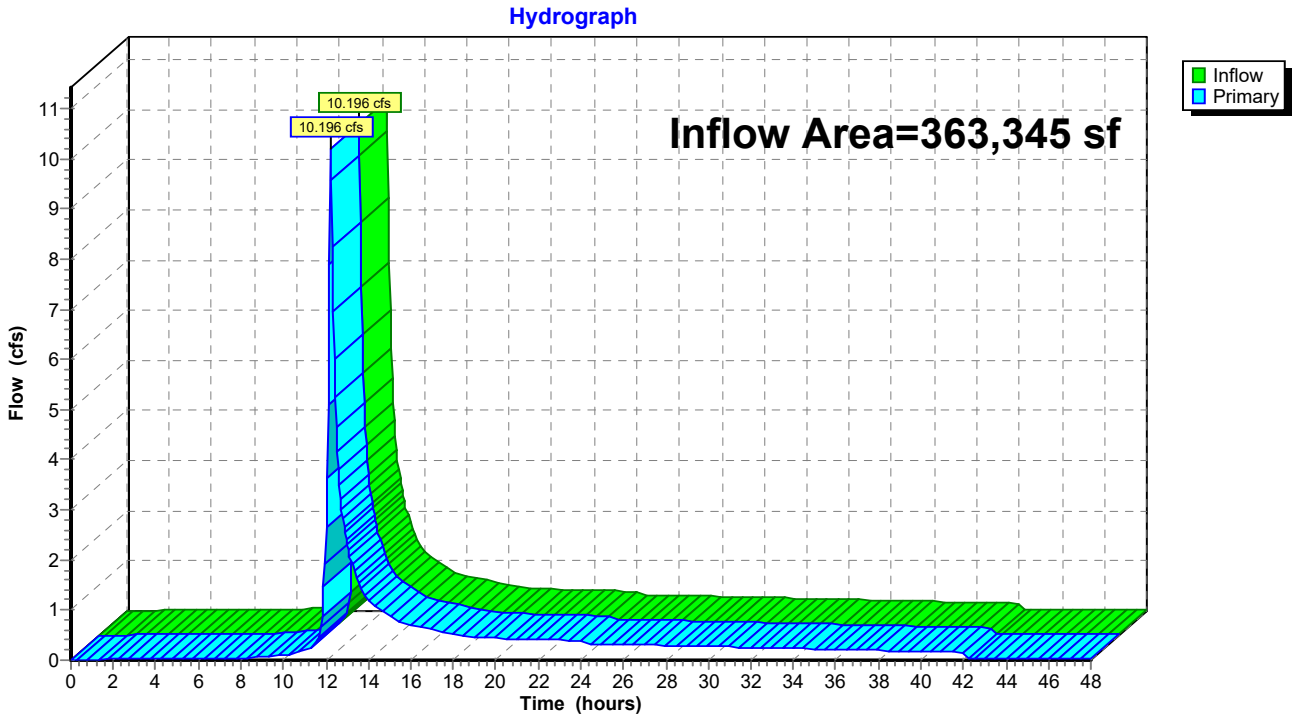


Summary for Link SP2: Fore River

Inflow Area = 363,345 sf, 57.06% Impervious, Inflow Depth > 2.12" for 2-Year event
Inflow = 10.196 cfs @ 12.22 hrs, Volume= 64,333 cf
Primary = 10.196 cfs @ 12.22 hrs, Volume= 64,333 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP2: Fore River



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Driveway Entrance Runoff Area=10,610 sf 96.56% Impervious Runoff Depth=4.25"
Tc=6.0 min CN=97 Runoff=1.061 cfs 3,756 cf

Subcatchment2S: Employee Parking Lot Runoff Area=29,100 sf 41.51% Impervious Runoff Depth=3.19"
Tc=6.0 min CN=87 Runoff=2.412 cfs 7,741 cf

Subcatchment3S: Eastern Parking Lot Runoff Area=115,360 sf 73.77% Impervious Runoff Depth=3.81"
Tc=6.0 min CN=93 Runoff=10.913 cfs 36,585 cf

Subcatchment4S: Office Building Roof Runoff Area=17,085 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98 Runoff=1.722 cfs 6,213 cf

Subcatchment5S: Warehouse Building Runoff Area=32,430 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98 Runoff=3.268 cfs 11,793 cf

Subcatchment6S: Warehouse Building Runoff Area=57,870 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98 Runoff=5.832 cfs 21,045 cf

Subcatchment7S: Area South of Building Runoff Area=27,050 sf 8.71% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=82 Runoff=1.941 cfs 6,140 cf

Subcatchment8S: Western and Southern Runoff Area=84,450 sf 0.50% Impervious Runoff Depth=2.55"
Tc=0.0 min CN=80 Runoff=6.656 cfs 17,924 cf

Pond 1P: R-Tank, StormFilter & OCS Peak Elev=5.17' Storage=26,652 cf Inflow=26.085 cfs 89,517 cf
Primary=0.344 cfs 33,719 cf Secondary=21.128 cfs 54,831 cf Outflow=21.432 cfs 88,550 cf

Pond 2P: DMH-4 Peak Elev=2.64' Inflow=21.432 cfs 88,550 cf
36.0" Round Culvert n=0.013 L=61.0' S=0.0051 '/' Outflow=21.432 cfs 88,550 cf

Link SP1: Commercial St Drainage Inflow=1.061 cfs 3,756 cf
Primary=1.061 cfs 3,756 cf

Link SP2: Fore River Inflow=24.254 cfs 106,475 cf
Primary=24.254 cfs 106,475 cf

Total Runoff Area = 373,955 sf Runoff Volume = 111,198 cf Average Runoff Depth = 3.57"
41.82% Pervious = 156,370 sf 58.18% Impervious = 217,585 sf

Summary for Subcatchment 1S: Driveway Entrance

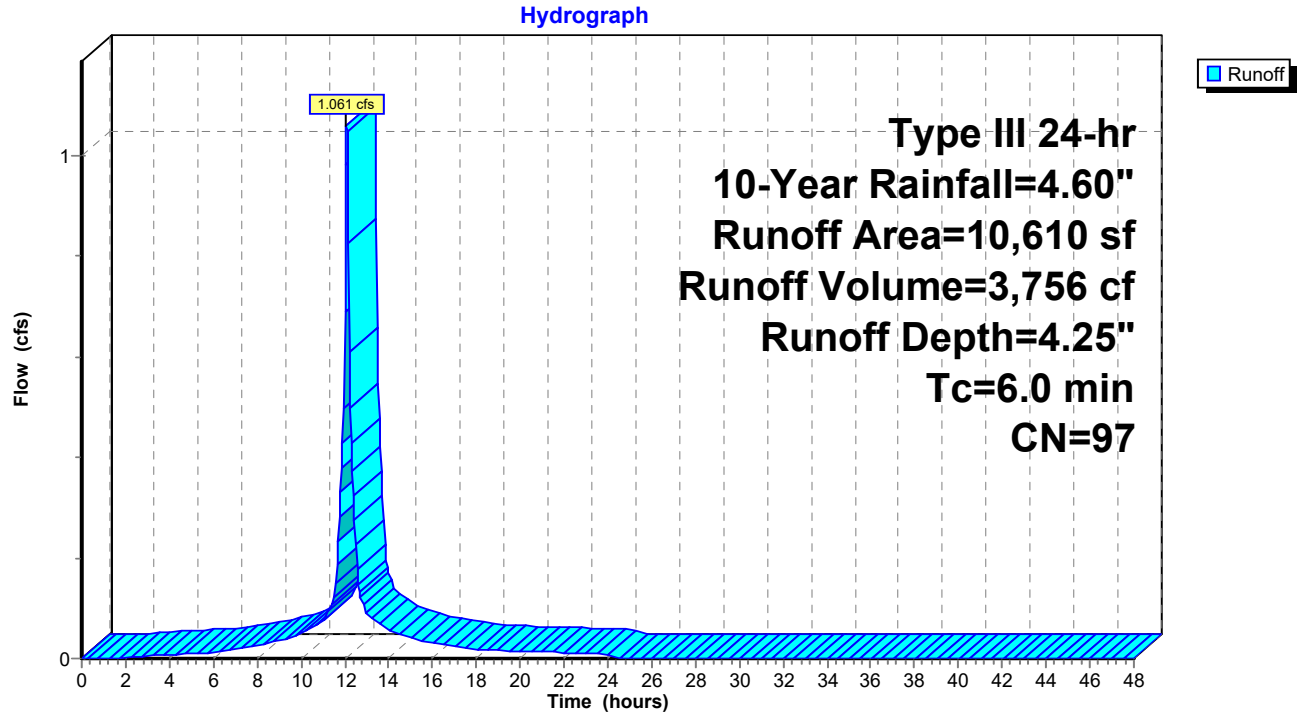
Runoff = 1.061 cfs @ 12.09 hrs, Volume= 3,756 cf, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	10,245	98	Impervious
	365	80	>75% Grass cover, Good, HSG D
	10,610	97	Weighted Average
	365		3.44% Pervious Area
	10,245		96.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1S: Driveway Entrance



Summary for Subcatchment 2S: Employee Parking Lot

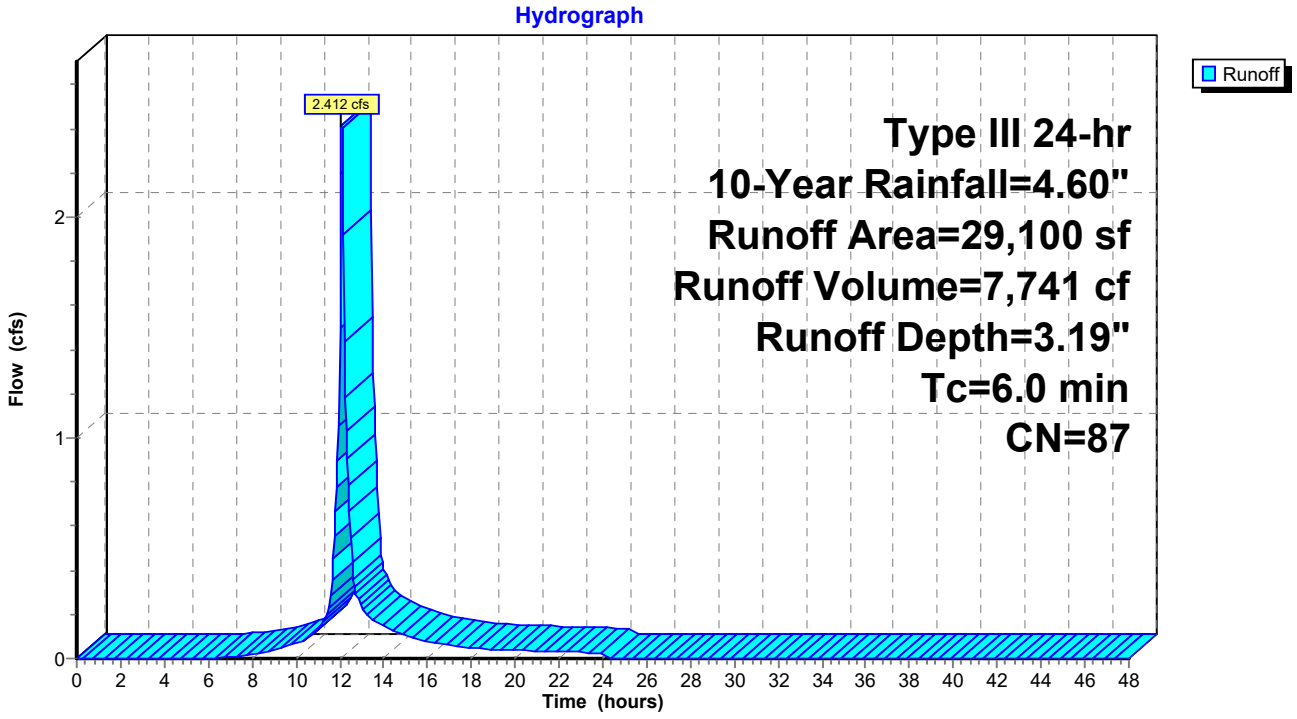
Runoff = 2.412 cfs @ 12.09 hrs, Volume= 7,741 cf, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	12,080	98	Impervious
	17,020	80	>75% Grass cover, Good, HSG D
	29,100	87	Weighted Average
	17,020		58.49% Pervious Area
	12,080		41.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Employee Parking Lot



Summary for Subcatchment 3S: Eastern Parking Lot and Loading Zone

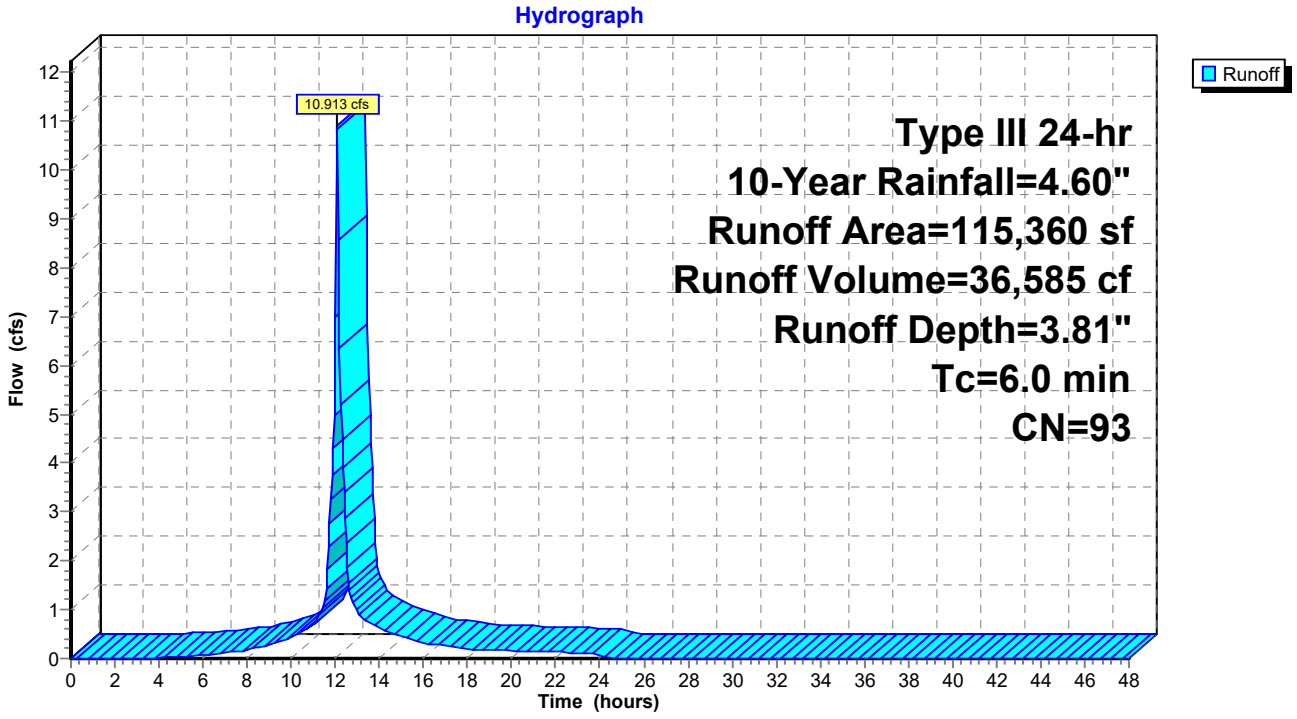
Runoff = 10.913 cfs @ 12.09 hrs, Volume= 36,585 cf, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	85,100	98	Impervious
	30,260	80	>75% Grass cover, Good, HSG D
	115,360	93	Weighted Average
	30,260		26.23% Pervious Area
	85,100		73.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3S: Eastern Parking Lot and Loading Zone



Summary for Subcatchment 4S: Office Building Roof

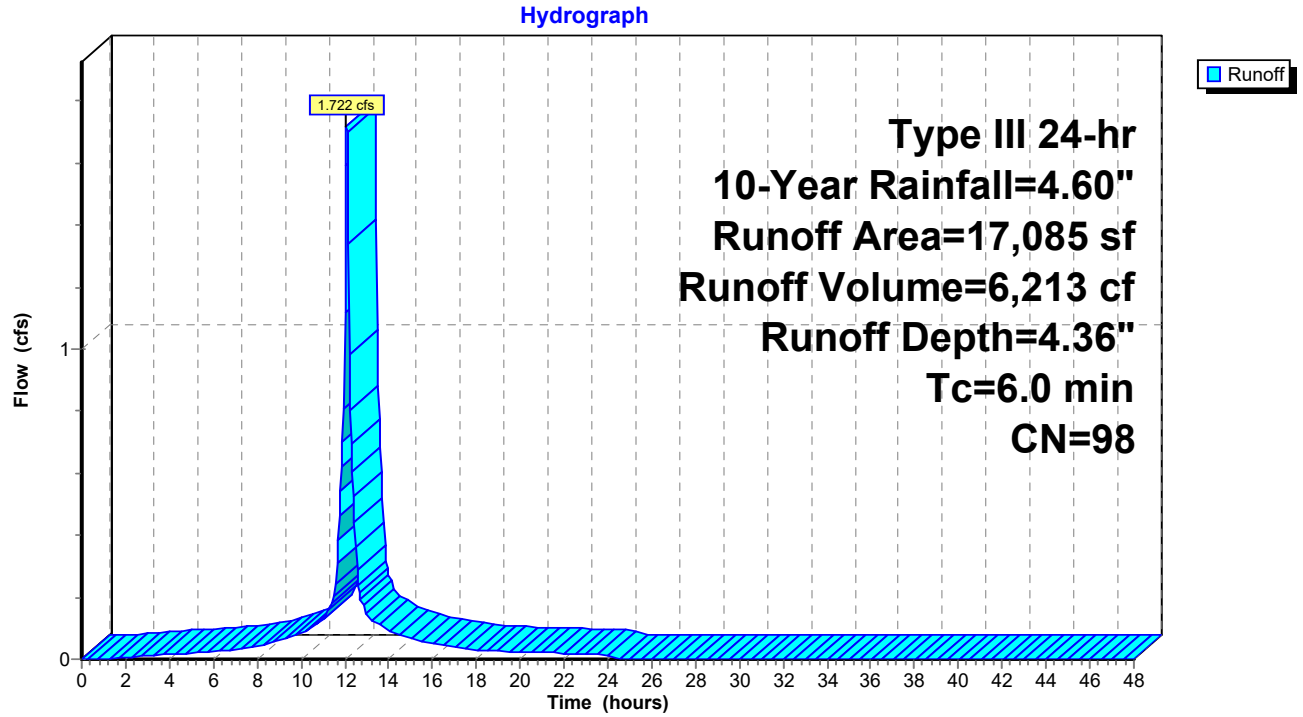
Runoff = 1.722 cfs @ 12.09 hrs, Volume= 6,213 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	17,085	98	Impervious
	17,085		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: Office Building Roof



Summary for Subcatchment 5S: Warehouse Building Roof - West

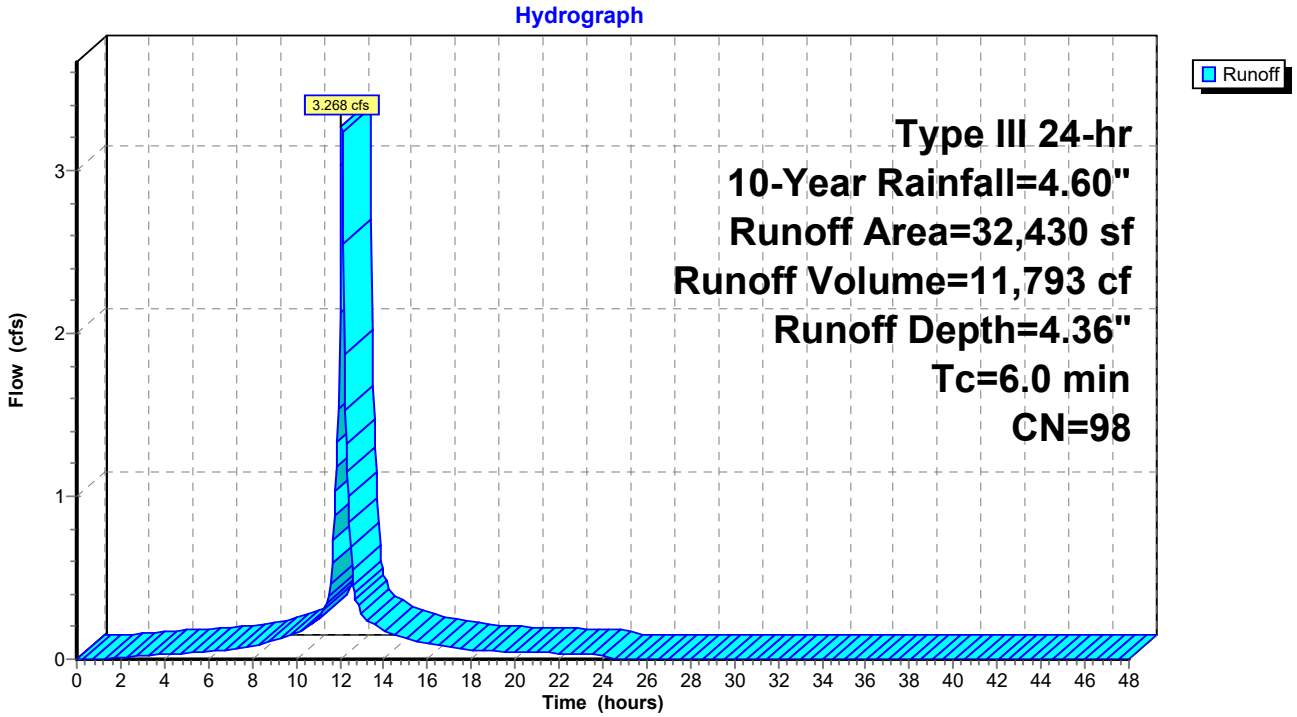
Runoff = 3.268 cfs @ 12.09 hrs, Volume= 11,793 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	32,430	98	Impervious
	32,430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: Warehouse Building Roof - West



Summary for Subcatchment 6S: Warehouse Building Roof - East

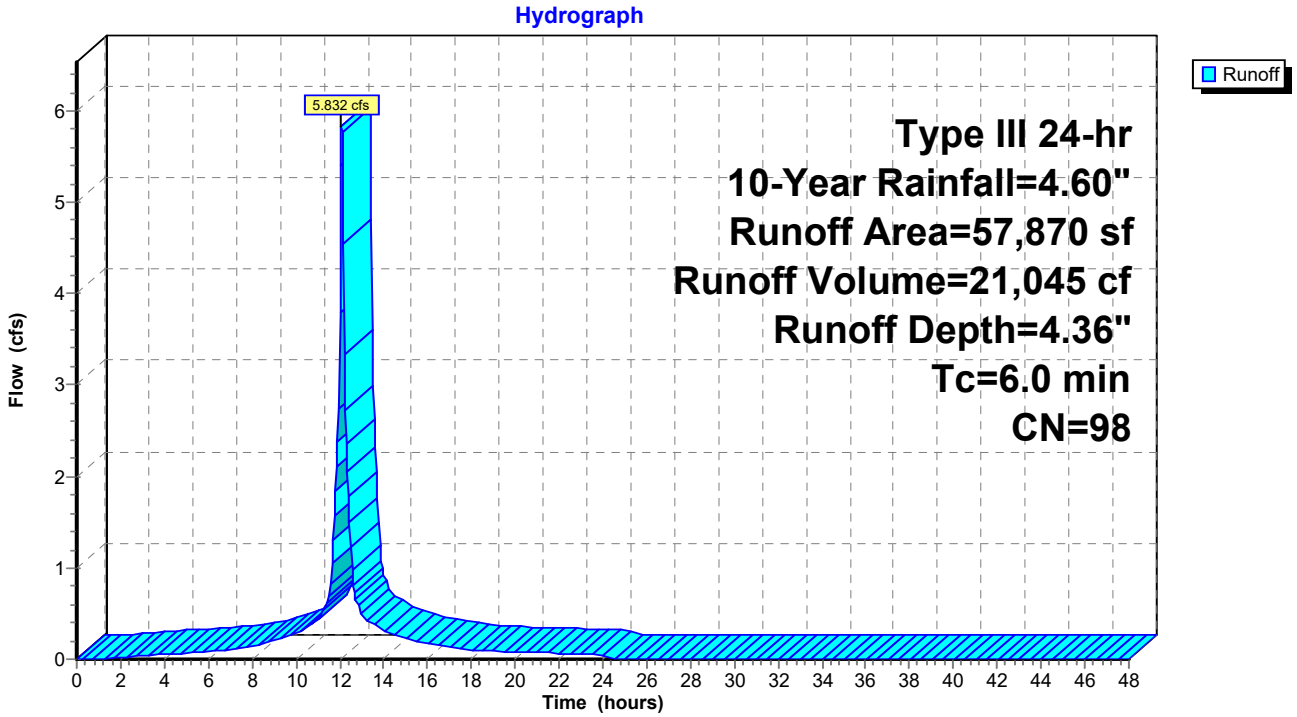
Runoff = 5.832 cfs @ 12.09 hrs, Volume= 21,045 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	57,870	98	Impervious
	57,870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6S: Warehouse Building Roof - East



Summary for Subcatchment 7S: Area South of Building

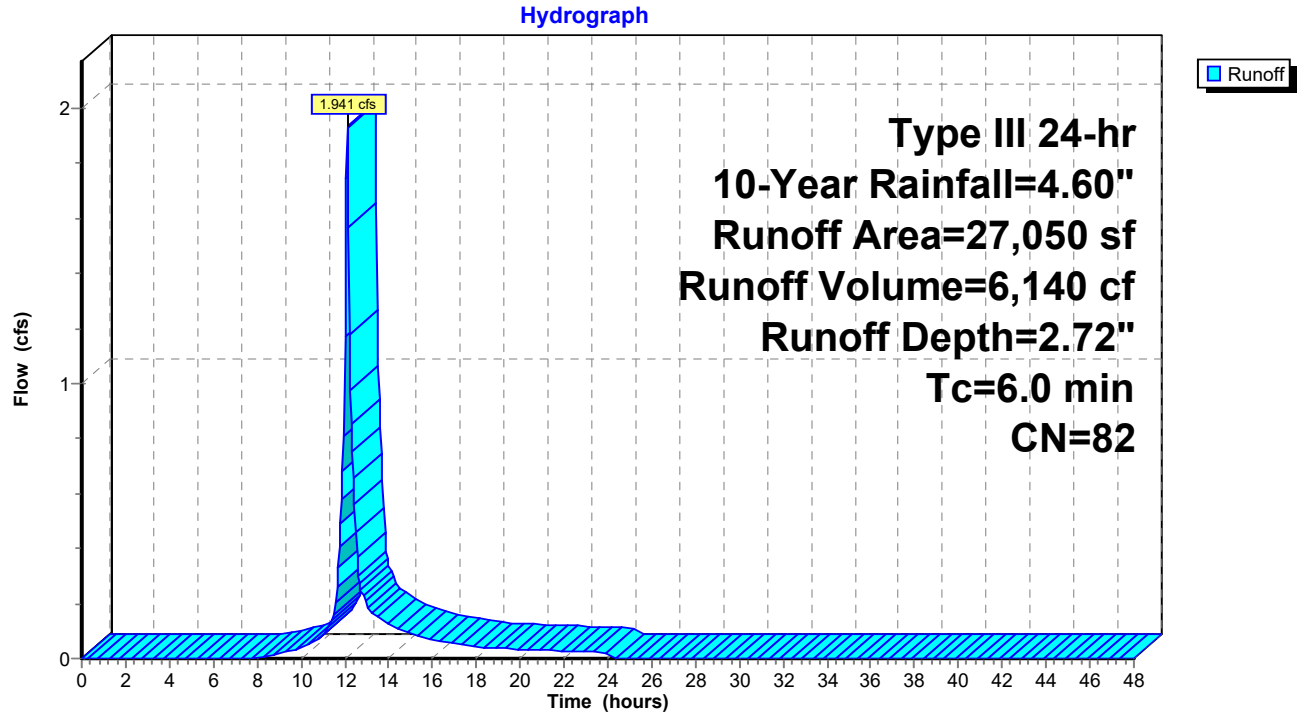
Runoff = 1.941 cfs @ 12.09 hrs, Volume= 6,140 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	2,355	98	Impervious
	24,695	80	>75% Grass cover, Good, HSG D
	27,050	82	Weighted Average
	24,695		91.29% Pervious Area
	2,355		8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 7S: Area South of Building



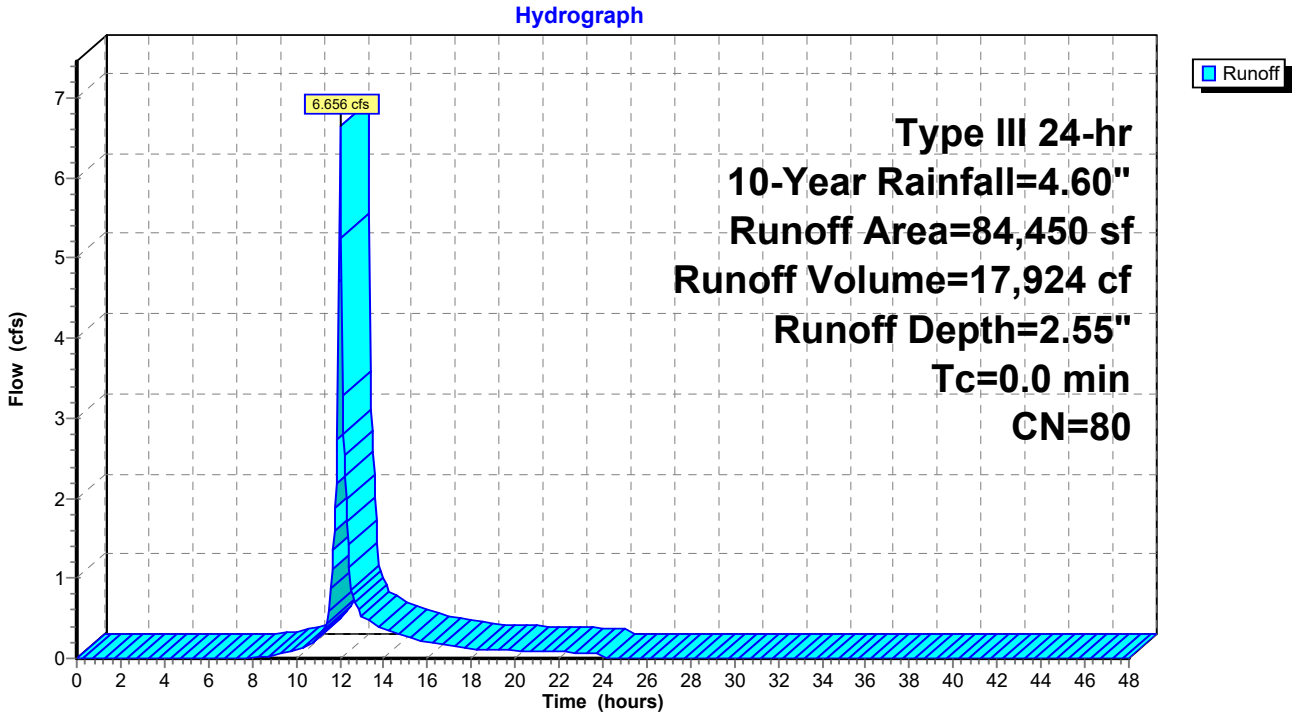
Summary for Subcatchment 8S: Western and Southern Edges of Site

Runoff = 6.656 cfs @ 12.00 hrs, Volume= 17,924 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	420	98	Impervious
	84,030	80	>75% Grass cover, Good, HSG D
	84,450	80	Weighted Average
	84,030		99.50% Pervious Area
	420		0.50% Impervious Area

Subcatchment 8S: Western and Southern Edges of Site



Summary for Pond 1P: R-Tank, StormFilter & OCS

Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth = 3.85" for 10-Year event
Inflow = 26.085 cfs @ 12.09 hrs, Volume= 89,517 cf
Outflow = 21.432 cfs @ 12.15 hrs, Volume= 88,550 cf, Atten= 18%, Lag= 3.7 min
Primary = 0.344 cfs @ 11.72 hrs, Volume= 33,719 cf
Secondary = 21.128 cfs @ 12.15 hrs, Volume= 54,831 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 5.17' @ 12.15 hrs Surf.Area= 7,194 sf Storage= 26,652 cf
Flood Elev= 9.52' Surf.Area= 7,194 sf Storage= 30,079 cf

Plug-Flow detention time= 282.2 min calculated for 88,550 cf (99% of inflow)
Center-of-Mass det. time= 275.2 min (1,047.0 - 771.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.81'	5,213 cf	**Stone Envelope (Prismatic)** Listed below (Recalc) 39,207 cf Overall - 26,174 cf Embedded = 13,033 cf x 40.0% Voids
#2	1.06'	24,866 cf	**R-Tank Triple Modules (Prismatic)** Listed below (Recalc) Inside #1 26,174 cf Overall x 95.0% Voids
		30,079 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.81	7,194	0	0
6.26	7,194	39,207	39,207

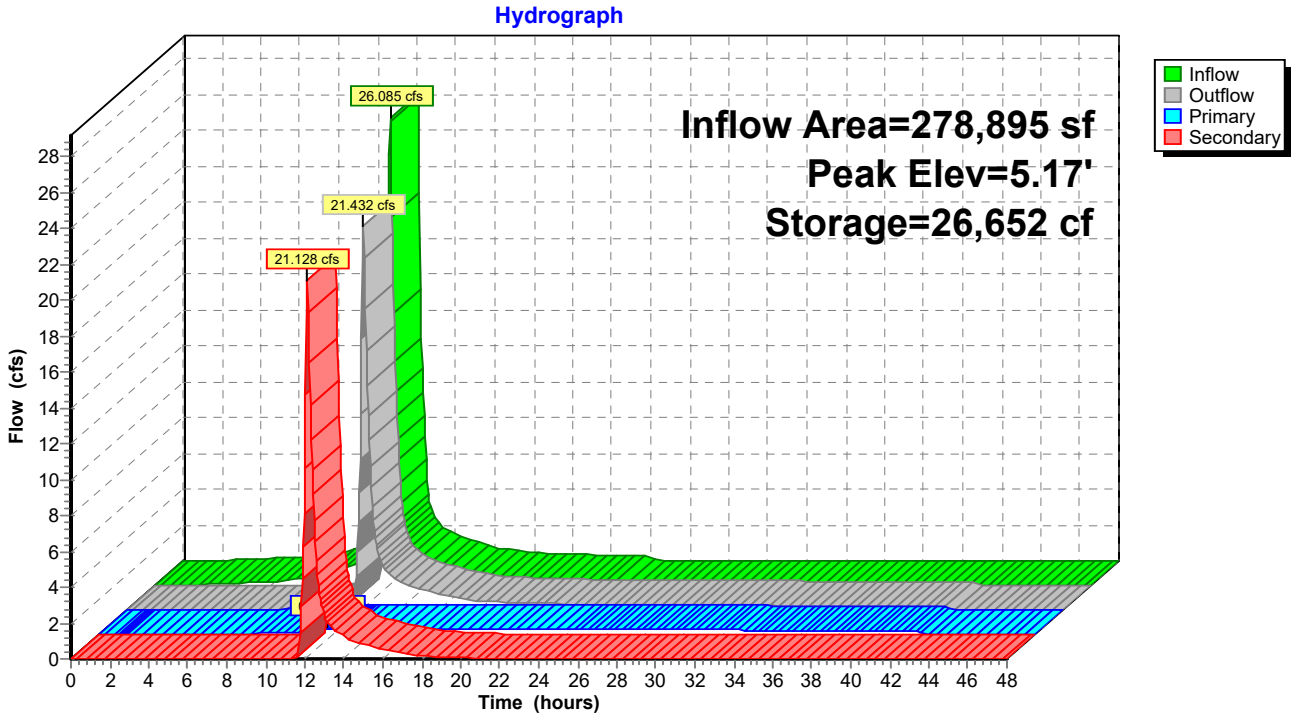
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.06	6,232	0	0
5.26	6,232	26,174	26,174

Device	Routing	Invert	Outlet Devices
#1	Primary	0.56'	**12.0" Round Culvert to DMH4** L= 4.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.56' / 0.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	0.56'	**SF - Tube/Siphon/Float Valve X 28.00** Starts@3.31' Breaks@1.23' 0.504" Diameter, C= 0.600, 0.263" Trickle Diameter
#3	Secondary	1.06'	**30.0" Round Bypass Culvert** L= 6.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1.06' / 0.85' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#4	Device 3	3.81'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.334 cfs @ 11.72 hrs HW=3.99' TW=0.79' (Dynamic Tailwater)
└─**1=Culvert to DMH4** (Passes 0.334 cfs of 5.114 cfs potential flow)
└─**2=SF - Tube/Siphon/Float Valve** (Orifice Controls 0.334 cfs @ 8.62 fps)

Secondary OutFlow Max=21.106 cfs @ 12.15 hrs HW=5.17' TW=2.64' (Dynamic Tailwater)
└─**3=Bypass Culvert** (Passes 21.106 cfs of 29.685 cfs potential flow)
└─**4=Broad-Crested Rectangular Weir** (Weir Controls 21.106 cfs @ 3.87 fps)

Pond 1P: R-Tank, StormFilter & OCS



Summary for Pond 2P: DMH-4

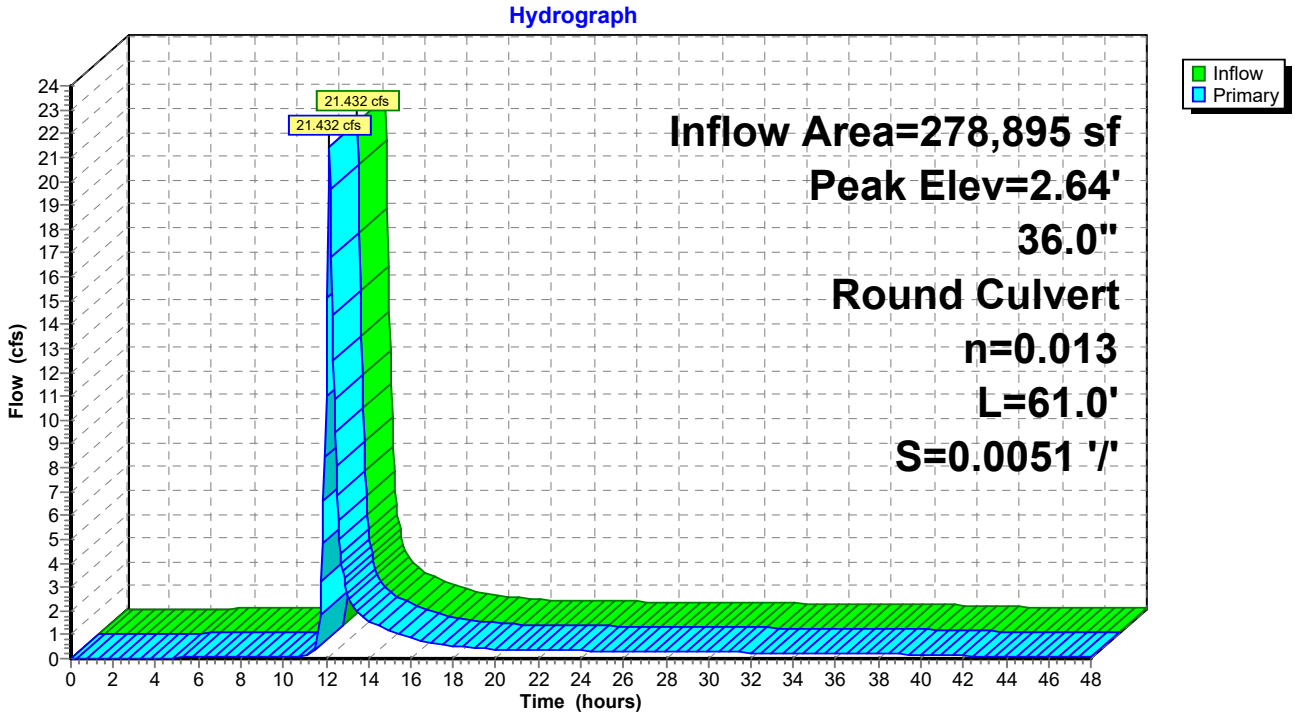
Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth > 3.81" for 10-Year event
Inflow = 21.432 cfs @ 12.15 hrs, Volume= 88,550 cf
Outflow = 21.432 cfs @ 12.15 hrs, Volume= 88,550 cf, Atten= 0%, Lag= 0.0 min
Primary = 21.432 cfs @ 12.15 hrs, Volume= 88,550 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 2.64' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.31'	**36.0" Round Culvert** L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.31' / 0.00' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=21.404 cfs @ 12.15 hrs HW=2.64' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 21.404 cfs @ 5.01 fps)

Pond 2P: DMH-4

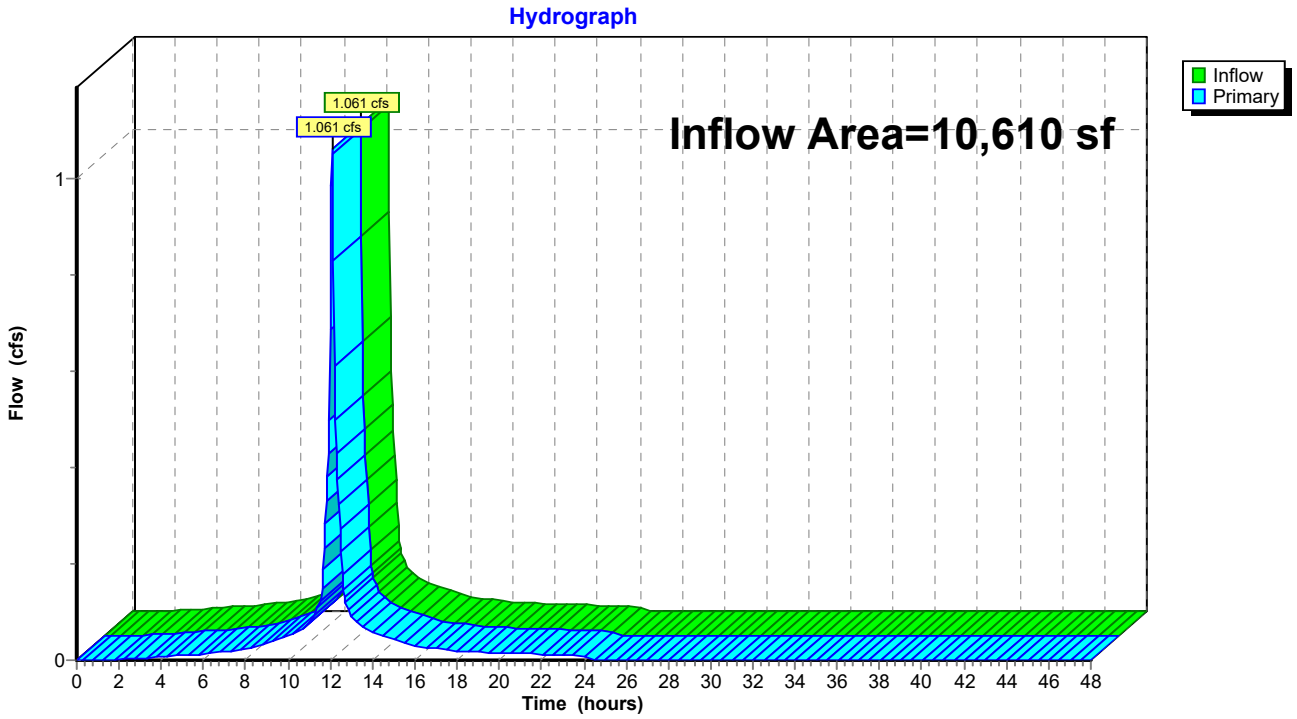


Summary for Link SP1: Commercial St Drainage

Inflow Area = 10,610 sf, 96.56% Impervious, Inflow Depth = 4.25" for 10-Year event
Inflow = 1.061 cfs @ 12.09 hrs, Volume= 3,756 cf
Primary = 1.061 cfs @ 12.09 hrs, Volume= 3,756 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP1: Commercial St Drainage

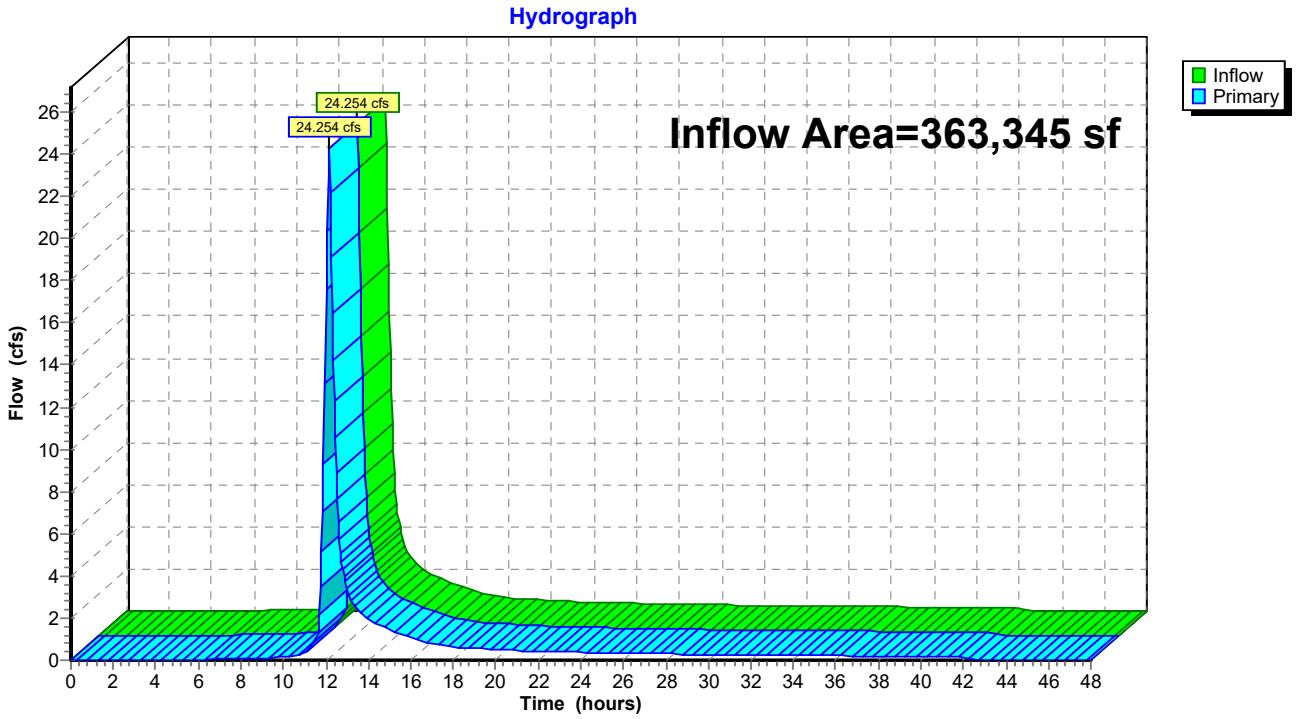


Summary for Link SP2: Fore River

Inflow Area = 363,345 sf, 57.06% Impervious, Inflow Depth > 3.52" for 10-Year event
Inflow = 24.254 cfs @ 12.14 hrs, Volume= 106,475 cf
Primary = 24.254 cfs @ 12.14 hrs, Volume= 106,475 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP2: Fore River



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Driveway Entrance Runoff Area=10,610 sf 96.56% Impervious Runoff Depth=5.44"
Tc=6.0 min CN=97 Runoff=1.344 cfs 4,814 cf

Subcatchment2S: Employee Parking Lot Runoff Area=29,100 sf 41.51% Impervious Runoff Depth=4.33"
Tc=6.0 min CN=87 Runoff=3.226 cfs 10,491 cf

Subcatchment3S: Eastern Parking Lot Runoff Area=115,360 sf 73.77% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=93 Runoff=14.073 cfs 47,925 cf

Subcatchment4S: Office Building Roof Runoff Area=17,085 sf 100.00% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=98 Runoff=2.176 cfs 7,919 cf

Subcatchment5S: Warehouse Building Runoff Area=32,430 sf 100.00% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=98 Runoff=4.131 cfs 15,032 cf

Subcatchment6S: Warehouse Building Runoff Area=57,870 sf 100.00% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=98 Runoff=7.372 cfs 26,823 cf

Subcatchment7S: Area South of Building Runoff Area=27,050 sf 8.71% Impervious Runoff Depth=3.80"
Tc=6.0 min CN=82 Runoff=2.691 cfs 8,574 cf

Subcatchment8S: Western and Southern Runoff Area=84,450 sf 0.50% Impervious Runoff Depth=3.60"
Tc=0.0 min CN=80 Runoff=9.371 cfs 25,344 cf

Pond 1P: R-Tank, StormFilter & OCS Peak Elev=5.53' Storage=27,992 cf Inflow=33.665 cfs 116,763 cf
Primary=0.340 cfs 35,005 cf Secondary=29.353 cfs 80,746 cf Outflow=29.652 cfs 115,751 cf

Pond 2P: DMH-4 Peak Elev=3.19' Inflow=29.652 cfs 115,751 cf
36.0" Round Culvert n=0.013 L=61.0' S=0.0051 '/' Outflow=29.652 cfs 115,751 cf

Link SP1: Commercial St Drainage Inflow=1.344 cfs 4,814 cf
Primary=1.344 cfs 4,814 cf

Link SP2: Fore River Inflow=33.748 cfs 141,095 cf
Primary=33.748 cfs 141,095 cf

Total Runoff Area = 373,955 sf Runoff Volume = 146,921 cf Average Runoff Depth = 4.71"
41.82% Pervious = 156,370 sf 58.18% Impervious = 217,585 sf

Summary for Subcatchment 1S: Driveway Entrance

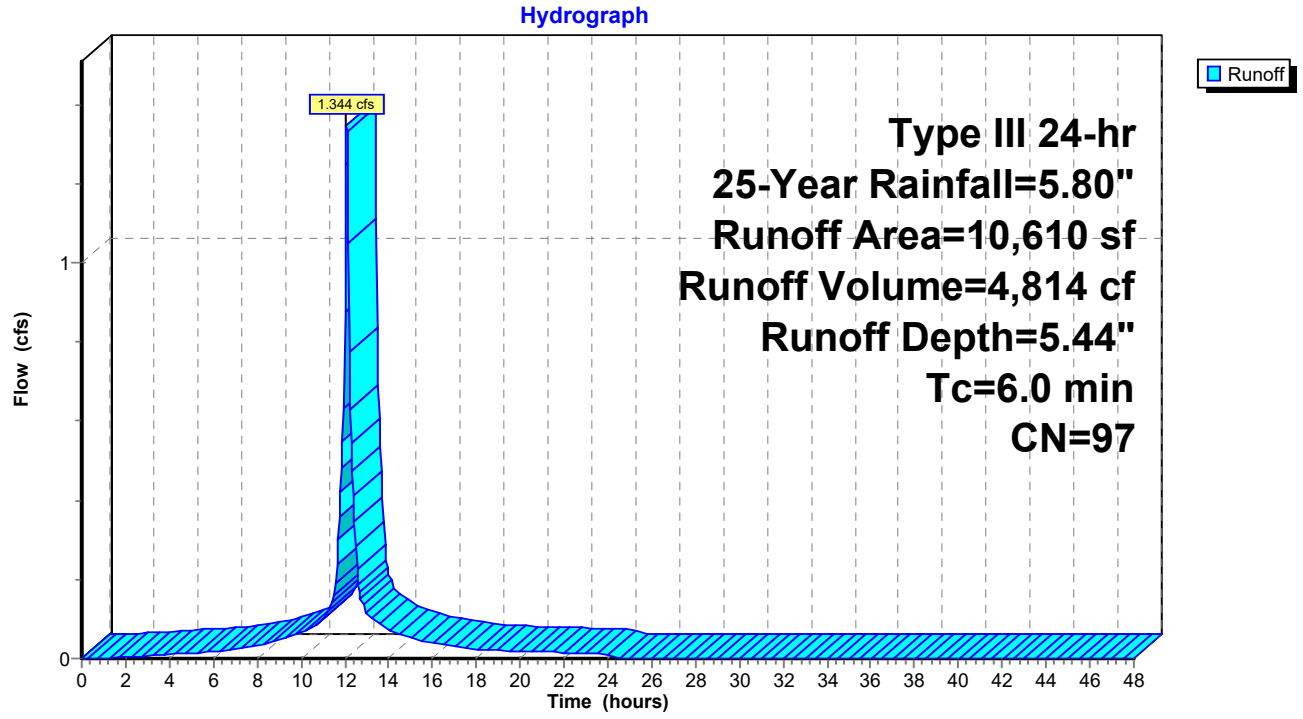
Runoff = 1.344 cfs @ 12.09 hrs, Volume= 4,814 cf, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	10,245	98	Impervious
	365	80	>75% Grass cover, Good, HSG D
	10,610	97	Weighted Average
	365		3.44% Pervious Area
	10,245		96.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1S: Driveway Entrance



Summary for Subcatchment 2S: Employee Parking Lot

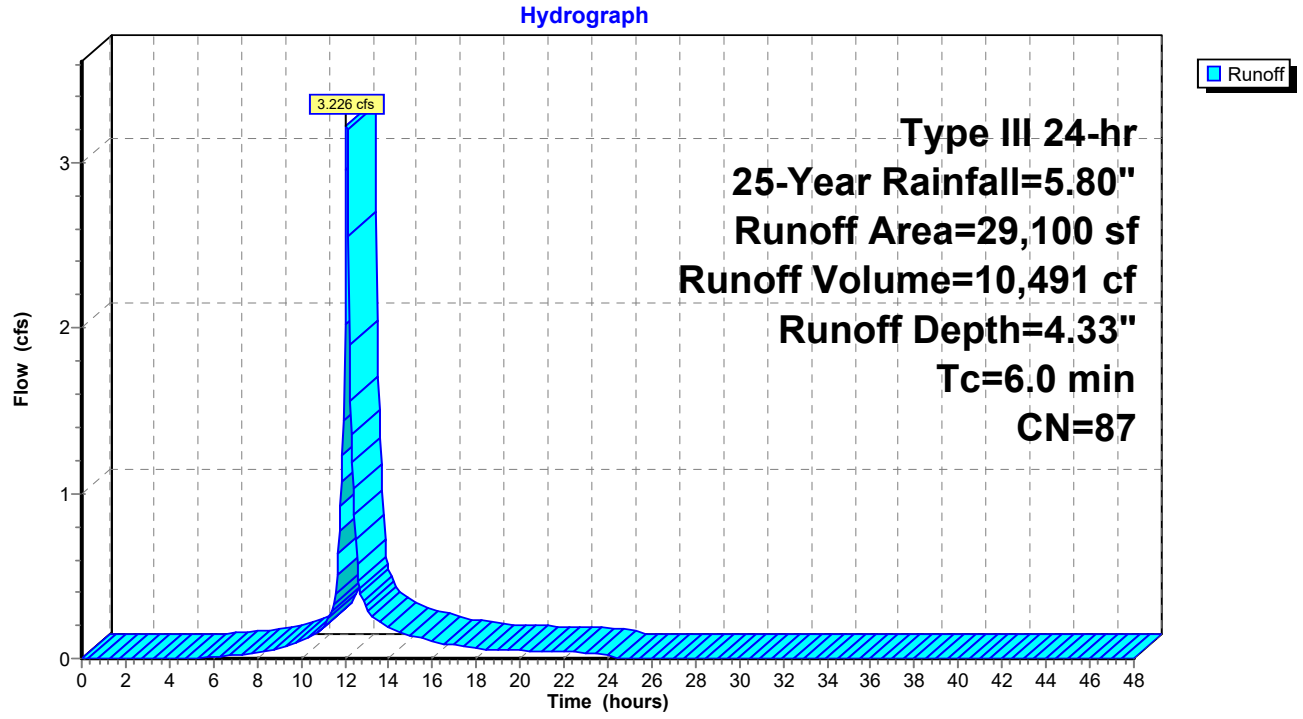
Runoff = 3.226 cfs @ 12.09 hrs, Volume= 10,491 cf, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	12,080	98	Impervious
	17,020	80	>75% Grass cover, Good, HSG D
	29,100	87	Weighted Average
	17,020		58.49% Pervious Area
	12,080		41.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Employee Parking Lot



Summary for Subcatchment 3S: Eastern Parking Lot and Loading Zone

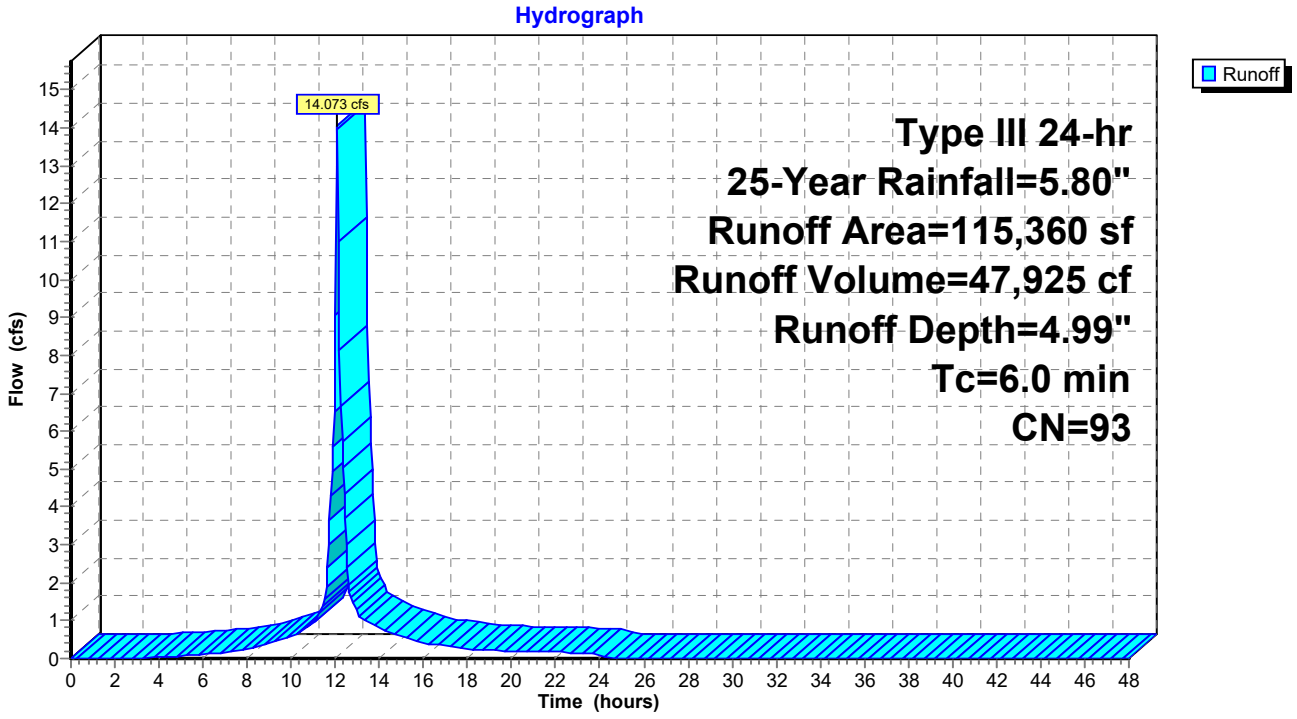
Runoff = 14.073 cfs @ 12.09 hrs, Volume= 47,925 cf, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	85,100	98	Impervious
	30,260	80	>75% Grass cover, Good, HSG D
	115,360	93	Weighted Average
	30,260		26.23% Pervious Area
	85,100		73.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3S: Eastern Parking Lot and Loading Zone



Summary for Subcatchment 4S: Office Building Roof

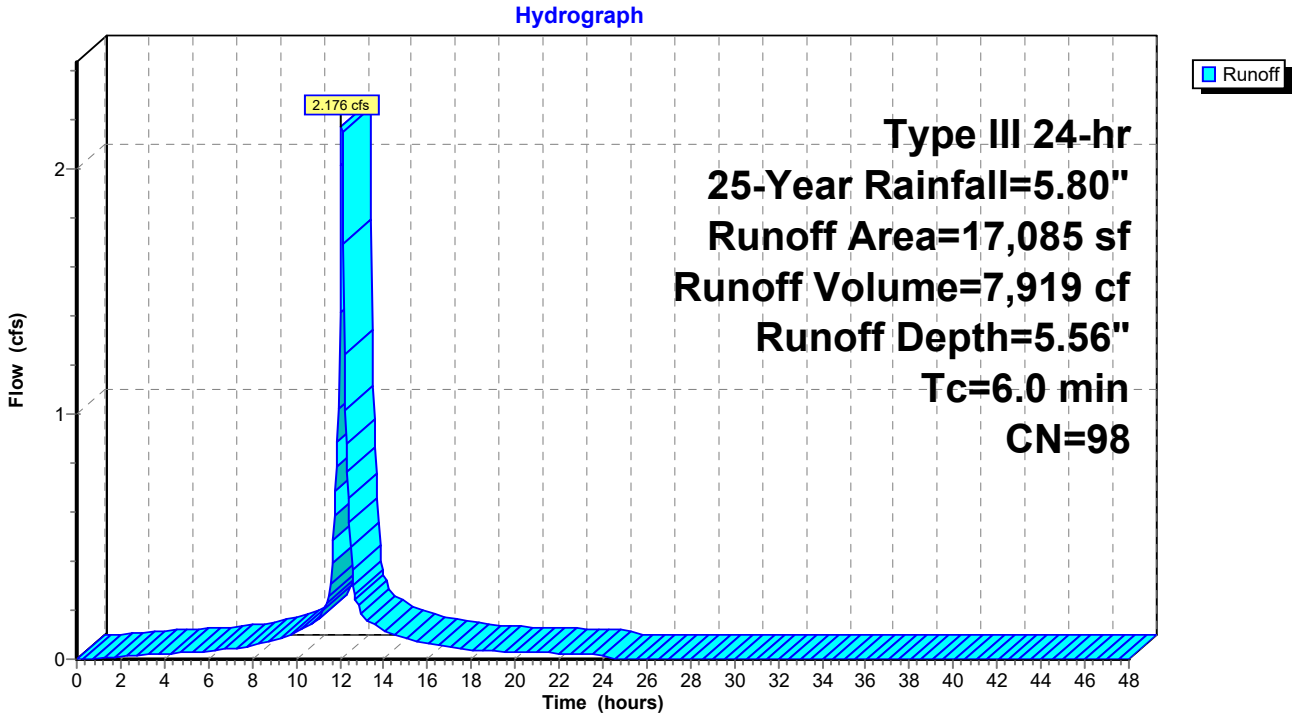
Runoff = 2.176 cfs @ 12.09 hrs, Volume= 7,919 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	17,085	98	Impervious
	17,085		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: Office Building Roof



Summary for Subcatchment 5S: Warehouse Building Roof - West

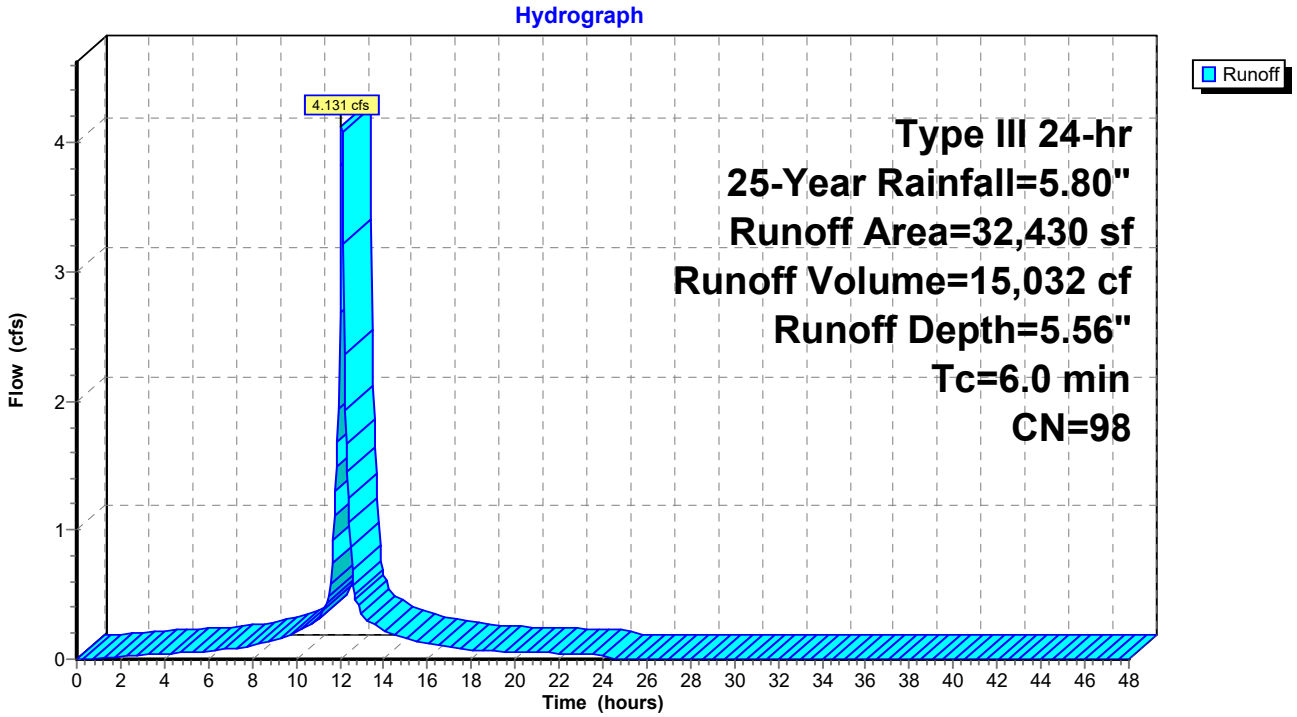
Runoff = 4.131 cfs @ 12.09 hrs, Volume= 15,032 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	32,430	98	Impervious
	32,430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: Warehouse Building Roof - West



Summary for Subcatchment 6S: Warehouse Building Roof - East

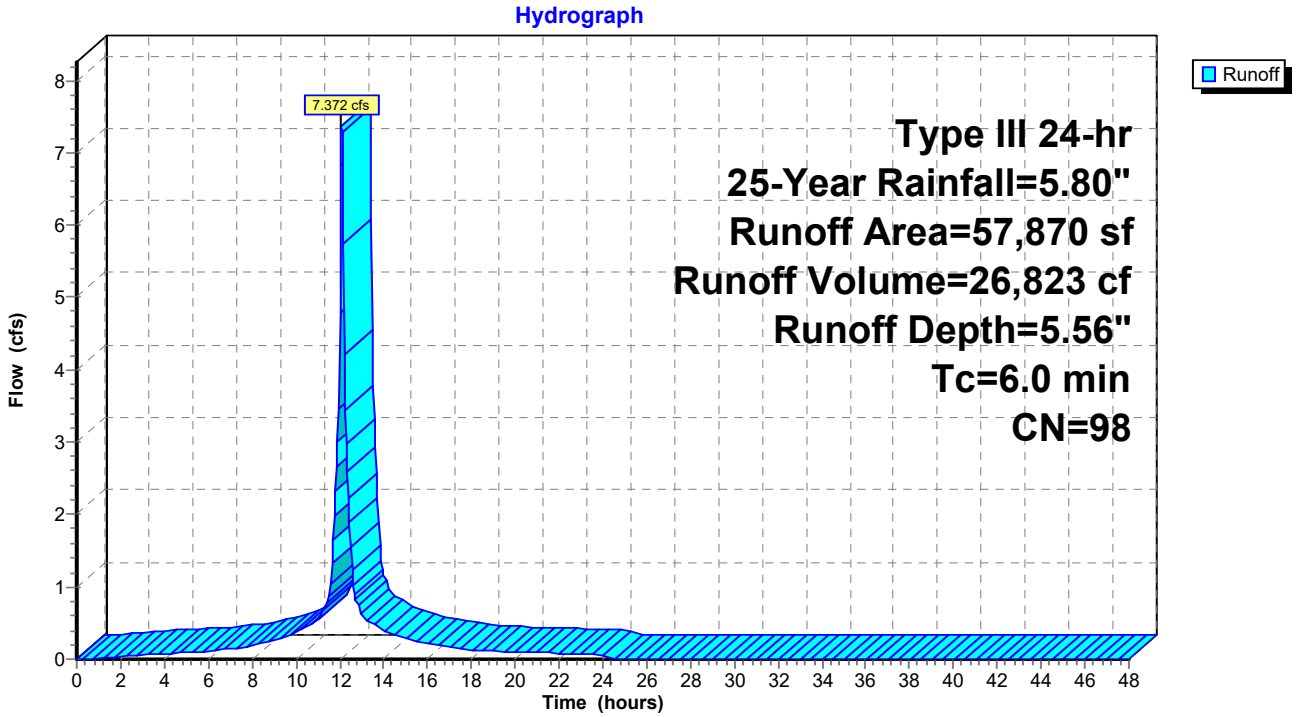
Runoff = 7.372 cfs @ 12.09 hrs, Volume= 26,823 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	57,870	98	Impervious
	57,870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6S: Warehouse Building Roof - East



Summary for Subcatchment 7S: Area South of Building

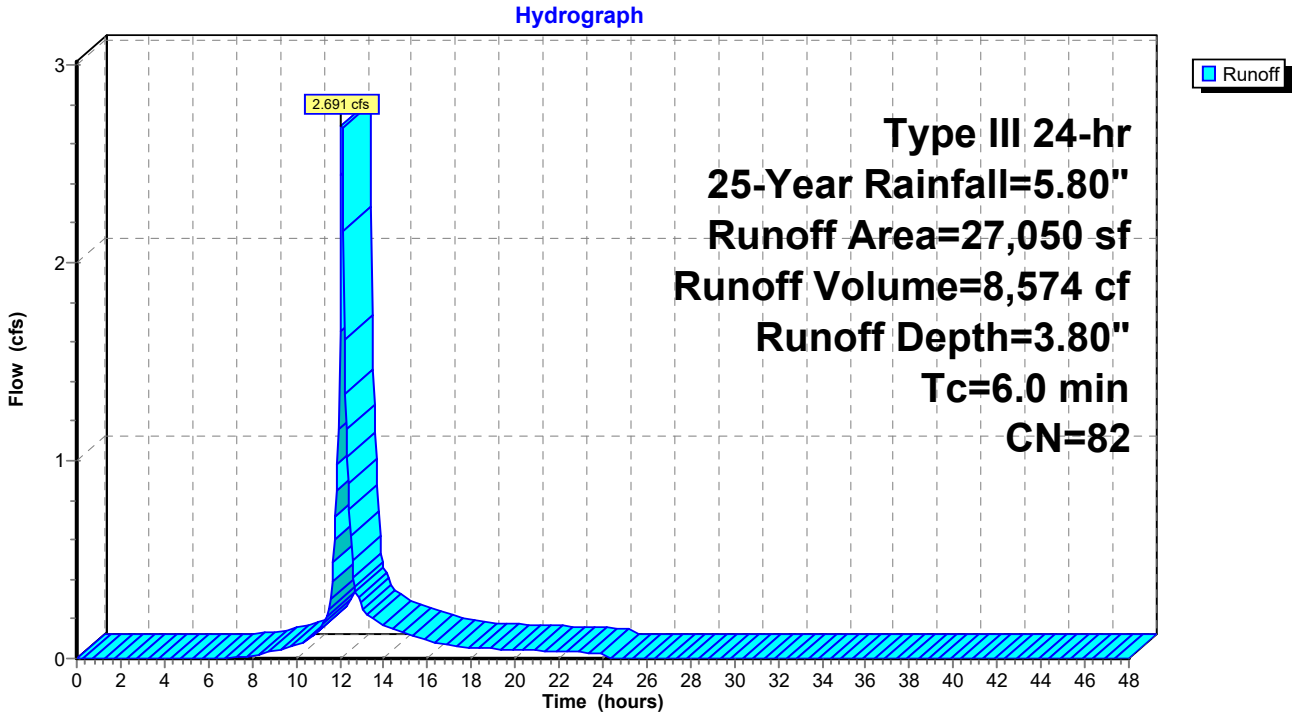
Runoff = 2.691 cfs @ 12.09 hrs, Volume= 8,574 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	2,355	98	Impervious
	24,695	80	>75% Grass cover, Good, HSG D
	27,050	82	Weighted Average
	24,695		91.29% Pervious Area
	2,355		8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 7S: Area South of Building



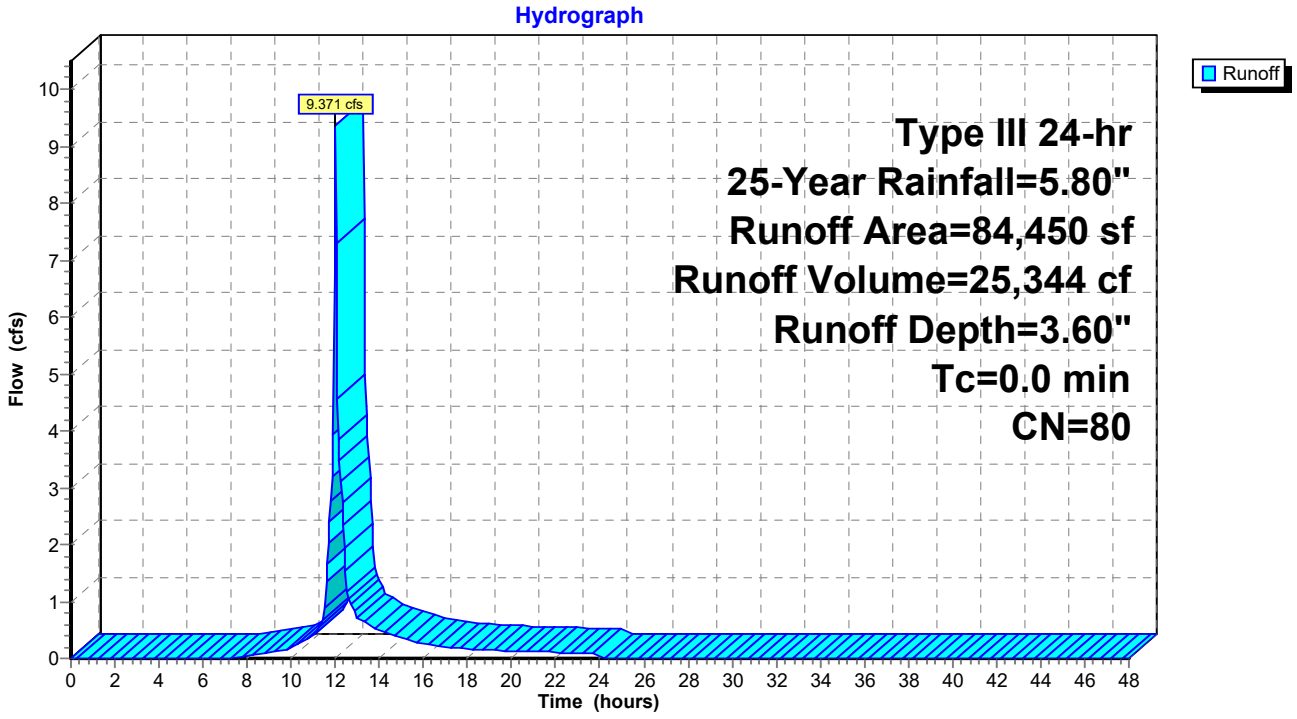
Summary for Subcatchment 8S: Western and Southern Edges of Site

Runoff = 9.371 cfs @ 12.00 hrs, Volume= 25,344 cf, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	420	98	Impervious
	84,030	80	>75% Grass cover, Good, HSG D
	84,450	80	Weighted Average
	84,030		99.50% Pervious Area
	420		0.50% Impervious Area

Subcatchment 8S: Western and Southern Edges of Site



Summary for Pond 1P: R-Tank, StormFilter & OCS

Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth = 5.02" for 25-Year event
Inflow = 33.665 cfs @ 12.09 hrs, Volume= 116,763 cf
Outflow = 29.652 cfs @ 12.13 hrs, Volume= 115,751 cf, Atten= 12%, Lag= 2.7 min
Primary = 0.340 cfs @ 11.11 hrs, Volume= 35,005 cf
Secondary = 29.353 cfs @ 12.13 hrs, Volume= 80,746 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 5.53' @ 12.14 hrs Surf.Area= 7,194 sf Storage= 27,992 cf
Flood Elev= 9.52' Surf.Area= 7,194 sf Storage= 30,079 cf

Plug-Flow detention time= 229.4 min calculated for 115,751 cf (99% of inflow)
Center-of-Mass det. time= 223.7 min (990.2 - 766.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.81'	5,213 cf	**Stone Envelope (Prismatic)** Listed below (Recalc) 39,207 cf Overall - 26,174 cf Embedded = 13,033 cf x 40.0% Voids
#2	1.06'	24,866 cf	**R-Tank Triple Modules (Prismatic)** Listed below (Recalc) Inside #1 26,174 cf Overall x 95.0% Voids
		30,079 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.81	7,194	0	0
6.26	7,194	39,207	39,207

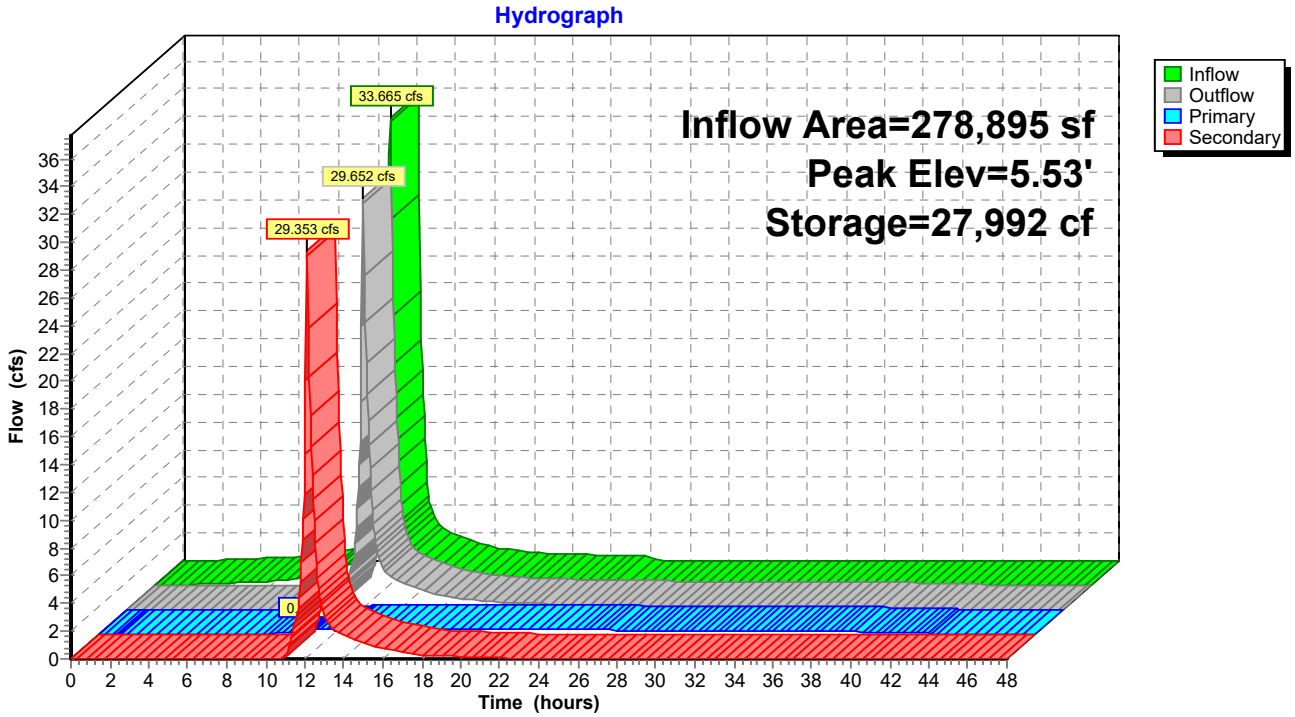
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.06	6,232	0	0
5.26	6,232	26,174	26,174

Device	Routing	Invert	Outlet Devices
#1	Primary	0.56'	**12.0" Round Culvert to DMH4** L= 4.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.56' / 0.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	0.56'	**SF - Tube/Siphon/Float Valve X 28.00** Starts@3.31' Breaks@1.23' 0.504" Diameter, C= 0.600, 0.263" Trickle Diameter
#3	Secondary	1.06'	**30.0" Round Bypass Culvert** L= 6.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1.06' / 0.85' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#4	Device 3	3.81'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.337 cfs @ 11.11 hrs HW=3.90' TW=0.66' (Dynamic Tailwater)
└─**1=Culvert to DMH4** (Passes 0.337 cfs of 5.034 cfs potential flow)
└─**2=SF - Tube/Siphon/Float Valve** (Orifice Controls 0.337 cfs @ 8.68 fps)

Secondary OutFlow Max=28.615 cfs @ 12.13 hrs HW=5.50' TW=3.15' (Dynamic Tailwater)
└─**3=Bypass Culvert** (Inlet Controls 28.615 cfs @ 5.83 fps)
└─**4=Broad-Crested Rectangular Weir** (Passes 28.615 cfs of 29.173 cfs potential flow)

Pond 1P: R-Tank, StormFilter & OCS



Summary for Pond 2P: DMH-4

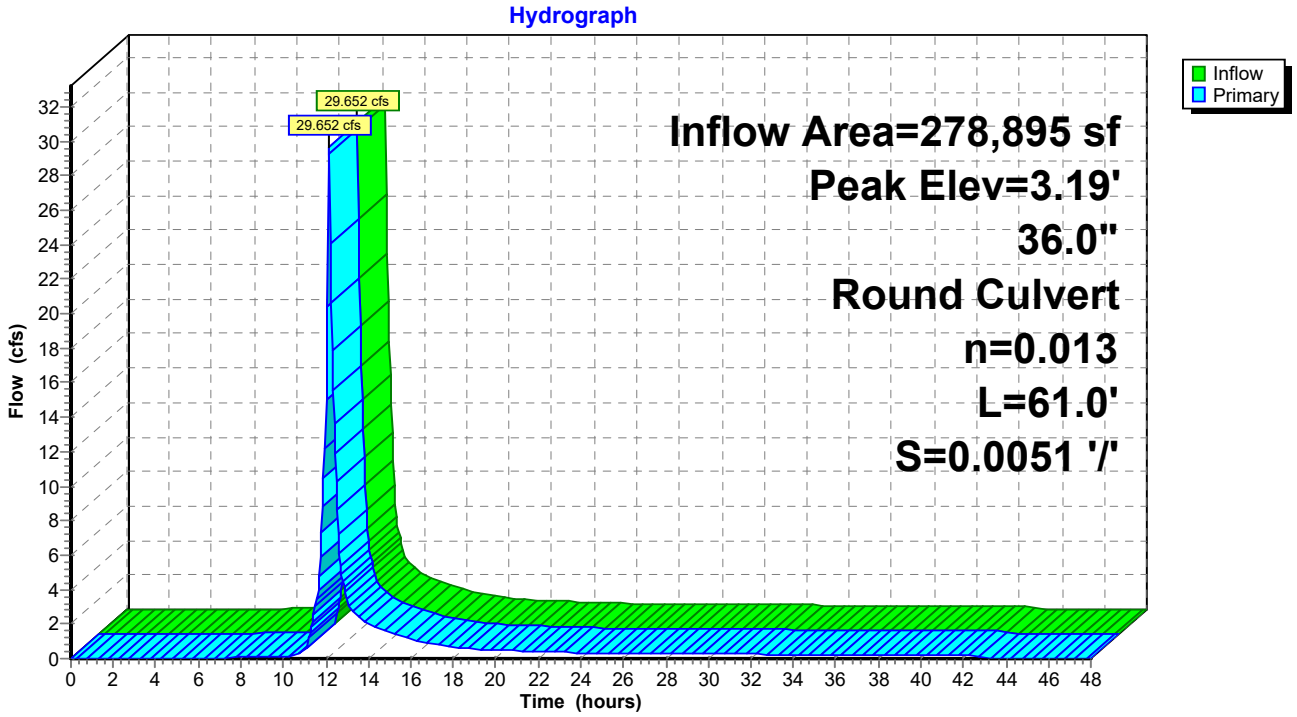
Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth > 4.98" for 25-Year event
Inflow = 29.652 cfs @ 12.13 hrs, Volume= 115,751 cf
Outflow = 29.652 cfs @ 12.13 hrs, Volume= 115,751 cf, Atten= 0%, Lag= 0.0 min
Primary = 29.652 cfs @ 12.13 hrs, Volume= 115,751 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 3.19' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.31'	**36.0" Round Culvert** L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.31' / 0.00' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=28.962 cfs @ 12.13 hrs HW=3.15' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 28.962 cfs @ 5.40 fps)

Pond 2P: DMH-4

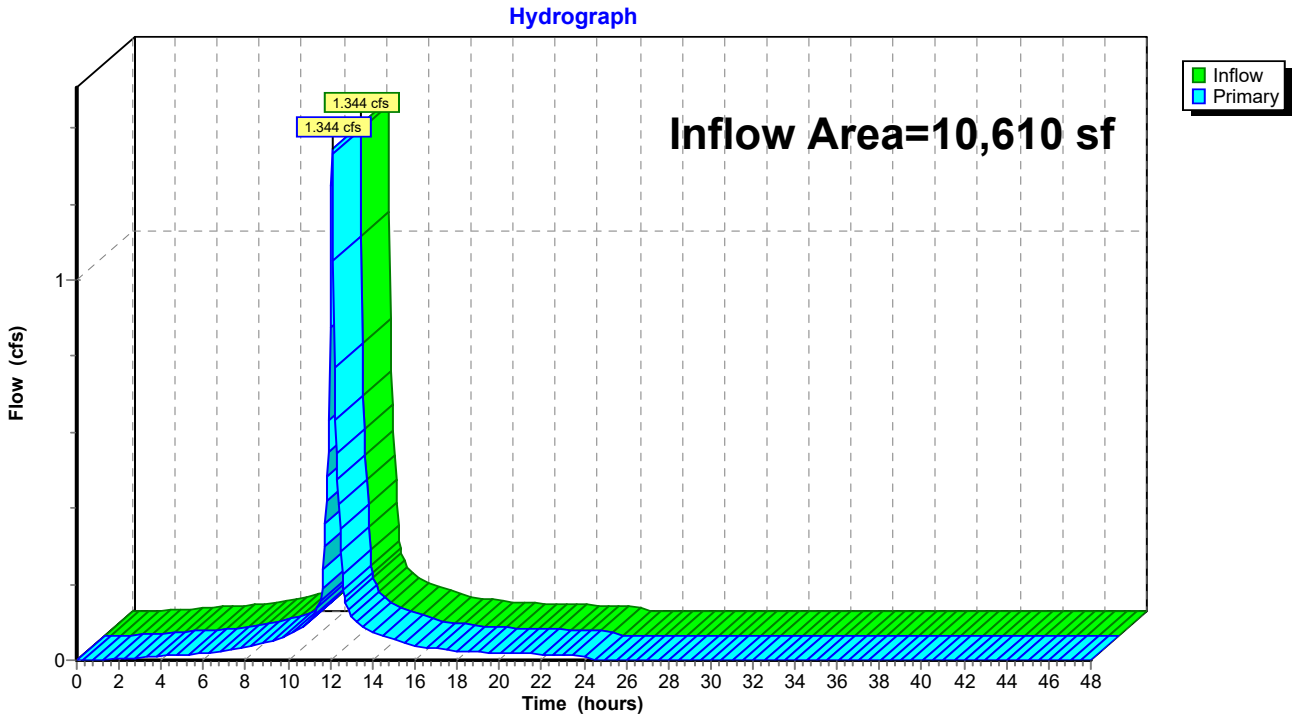


Summary for Link SP1: Commercial St Drainage

Inflow Area = 10,610 sf, 96.56% Impervious, Inflow Depth = 5.44" for 25-Year event
Inflow = 1.344 cfs @ 12.09 hrs, Volume= 4,814 cf
Primary = 1.344 cfs @ 12.09 hrs, Volume= 4,814 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP1: Commercial St Drainage

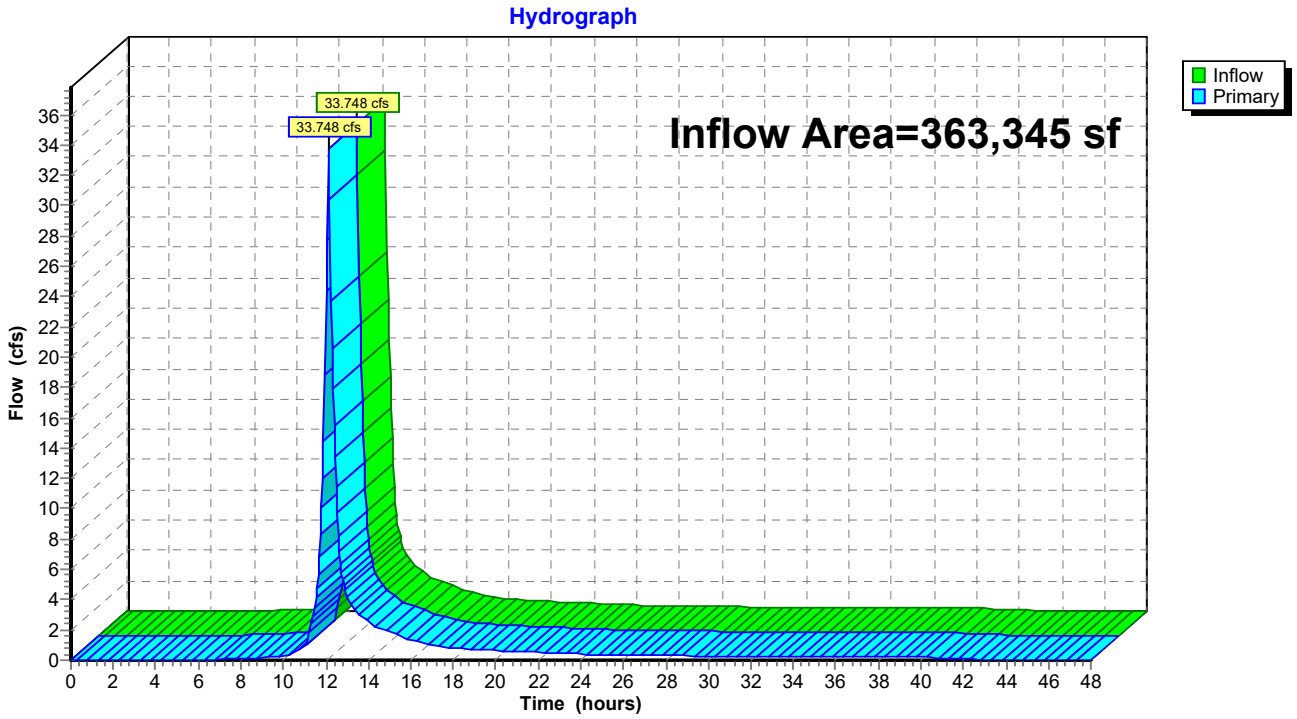


Summary for Link SP2: Fore River

Inflow Area = 363,345 sf, 57.06% Impervious, Inflow Depth > 4.66" for 25-Year event
Inflow = 33.748 cfs @ 12.13 hrs, Volume= 141,095 cf
Primary = 33.748 cfs @ 12.13 hrs, Volume= 141,095 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP2: Fore River



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Driveway Entrance Runoff Area=10,610 sf 96.56% Impervious Runoff Depth=1.13"
Tc=6.0 min CN=97 Runoff=0.302 cfs 995 cf

Subcatchment2S: Employee Parking Lot Runoff Area=29,100 sf 41.51% Impervious Runoff Depth=0.49"
Tc=6.0 min CN=87 Runoff=0.365 cfs 1,198 cf

Subcatchment3S: Eastern Parking Lot Runoff Area=115,360 sf 73.77% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=93 Runoff=2.478 cfs 7,827 cf

Subcatchment4S: Office Building Roof Runoff Area=17,085 sf 100.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=98 Runoff=0.514 cfs 1,739 cf

Subcatchment5S: Warehouse Building Runoff Area=32,430 sf 100.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=98 Runoff=0.975 cfs 3,300 cf

Subcatchment6S: Warehouse Building Runoff Area=57,870 sf 100.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=98 Runoff=1.739 cfs 5,889 cf

Subcatchment7S: Area South of Building Runoff Area=27,050 sf 8.71% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=82 Runoff=0.189 cfs 707 cf

Subcatchment8S: Western and Southern Runoff Area=84,450 sf 0.50% Impervious Runoff Depth=0.26"
Tc=0.0 min CN=80 Runoff=0.509 cfs 1,808 cf

Pond 1P: R-Tank, StormFilter & OCS Peak Elev=3.25' Storage=14,538 cf Inflow=6.252 cfs 20,659 cf
Primary=0.306 cfs 20,607 cf Secondary=0.000 cfs 0 cf Outflow=0.306 cfs 20,607 cf

Pond 2P: DMH-4 Peak Elev=0.55' Inflow=0.306 cfs 20,607 cf
36.0" Round Culvert n=0.013 L=61.0' S=0.0051 '/' Outflow=0.306 cfs 20,607 cf

Link SP1: Commercial St Drainage Inflow=0.302 cfs 995 cf
Primary=0.302 cfs 995 cf

Link SP2: Fore River Inflow=0.565 cfs 22,415 cf
Primary=0.565 cfs 22,415 cf

Total Runoff Area = 373,955 sf Runoff Volume = 23,462 cf Average Runoff Depth = 0.75"
41.82% Pervious = 156,370 sf 58.18% Impervious = 217,585 sf

Summary for Subcatchment 1S: Driveway Entrance

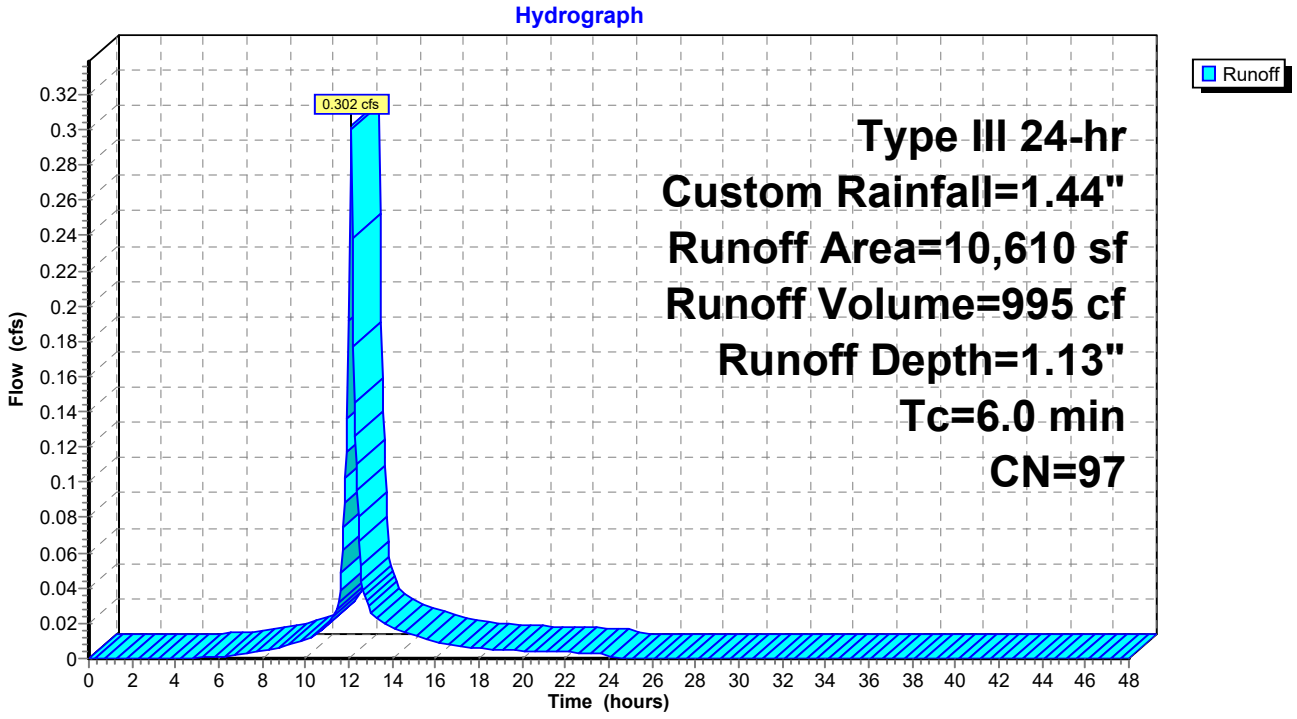
Runoff = 0.302 cfs @ 12.09 hrs, Volume= 995 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	10,245	98	Impervious
	365	80	>75% Grass cover, Good, HSG D
	10,610	97	Weighted Average
	365		3.44% Pervious Area
	10,245		96.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1S: Driveway Entrance



Summary for Subcatchment 2S: Employee Parking Lot

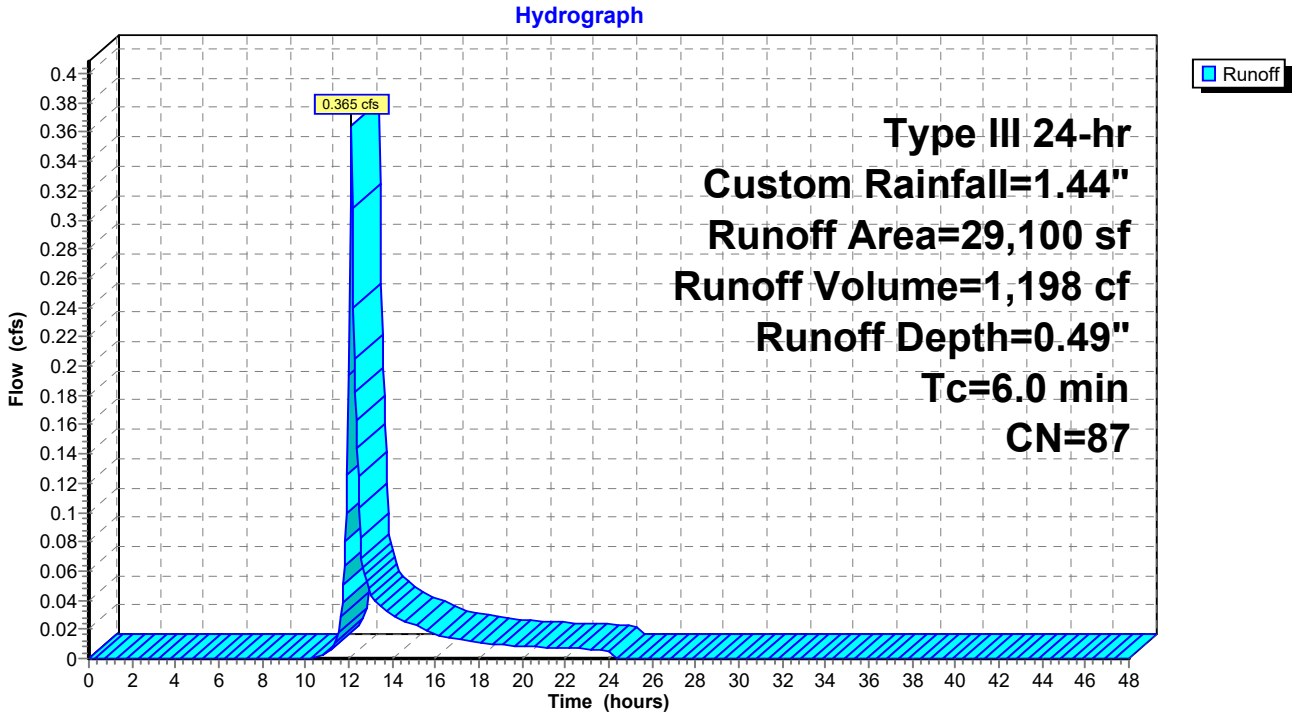
Runoff = 0.365 cfs @ 12.10 hrs, Volume= 1,198 cf, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	12,080	98	Impervious
	17,020	80	>75% Grass cover, Good, HSG D
	29,100	87	Weighted Average
	17,020		58.49% Pervious Area
	12,080		41.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Employee Parking Lot



Summary for Subcatchment 3S: Eastern Parking Lot and Loading Zone

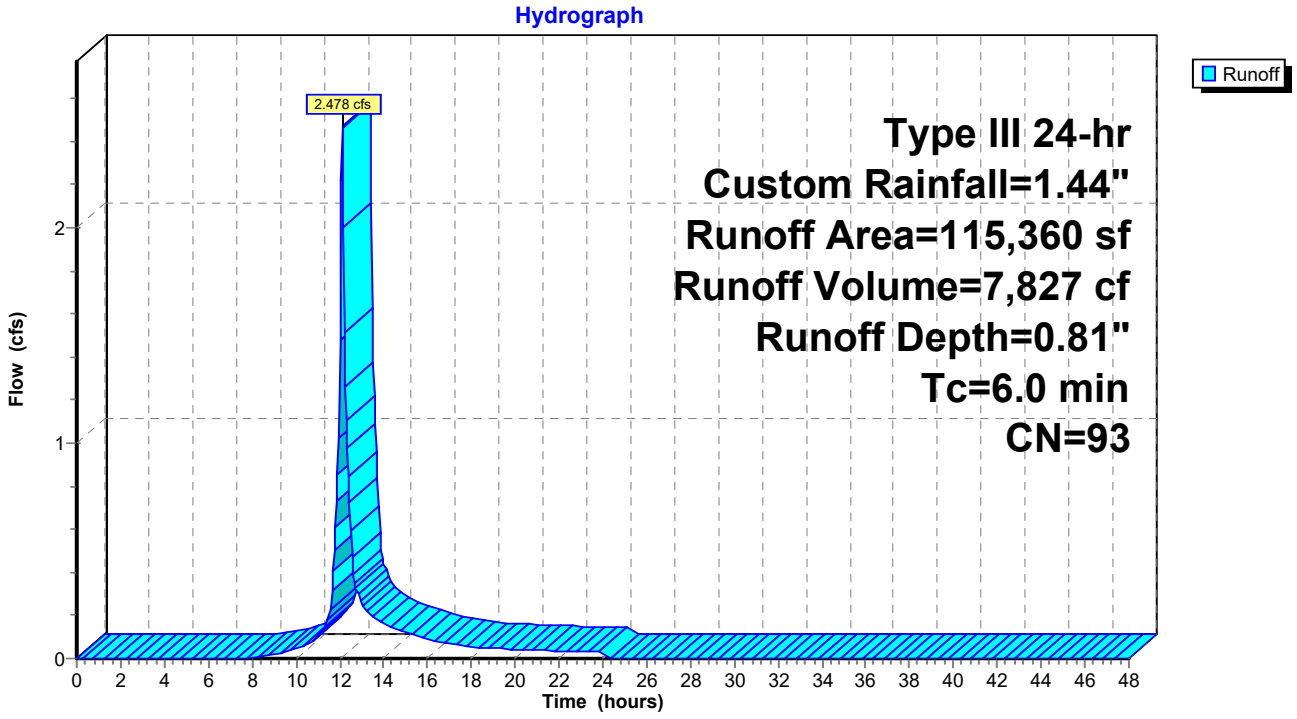
Runoff = 2.478 cfs @ 12.09 hrs, Volume= 7,827 cf, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	85,100	98	Impervious
	30,260	80	>75% Grass cover, Good, HSG D
	115,360	93	Weighted Average
	30,260		26.23% Pervious Area
	85,100		73.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3S: Eastern Parking Lot and Loading Zone



Summary for Subcatchment 4S: Office Building Roof

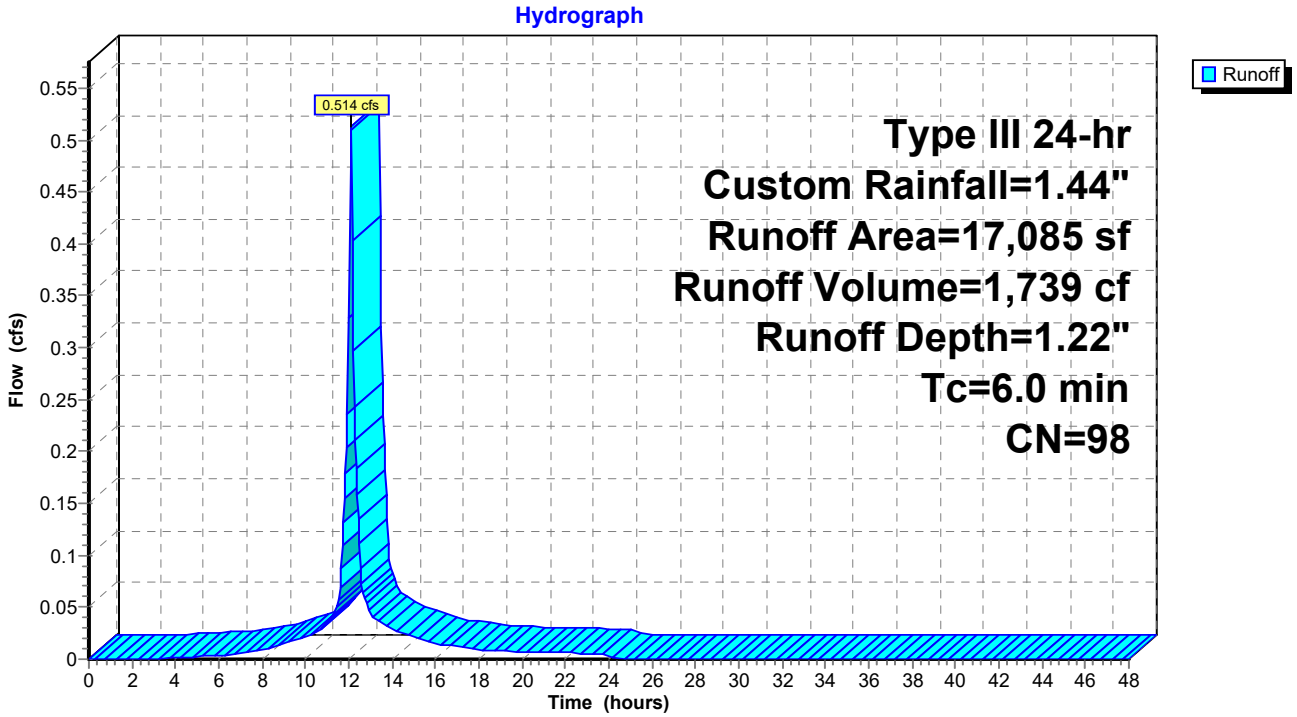
Runoff = 0.514 cfs @ 12.09 hrs, Volume= 1,739 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	17,085	98	Impervious
	17,085		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: Office Building Roof



Summary for Subcatchment 5S: Warehouse Building Roof - West

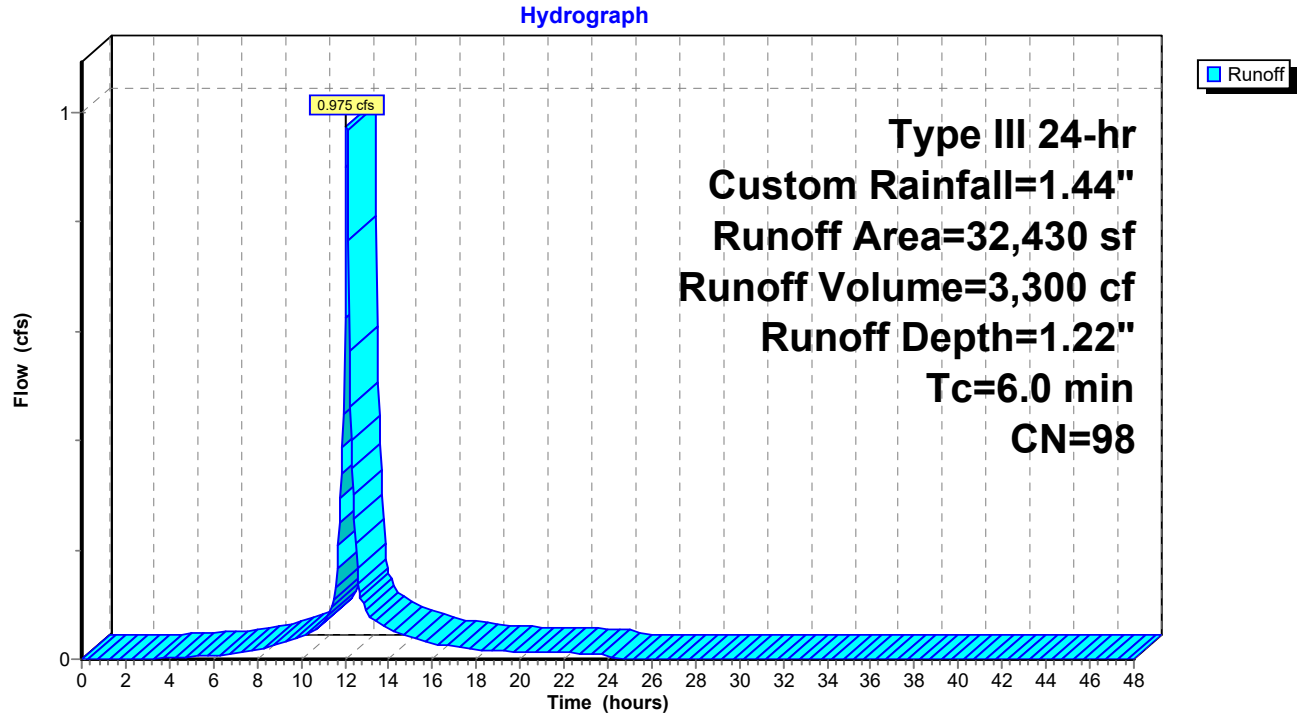
Runoff = 0.975 cfs @ 12.09 hrs, Volume= 3,300 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	32,430	98	Impervious
	32,430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: Warehouse Building Roof - West



Summary for Subcatchment 6S: Warehouse Building Roof - East

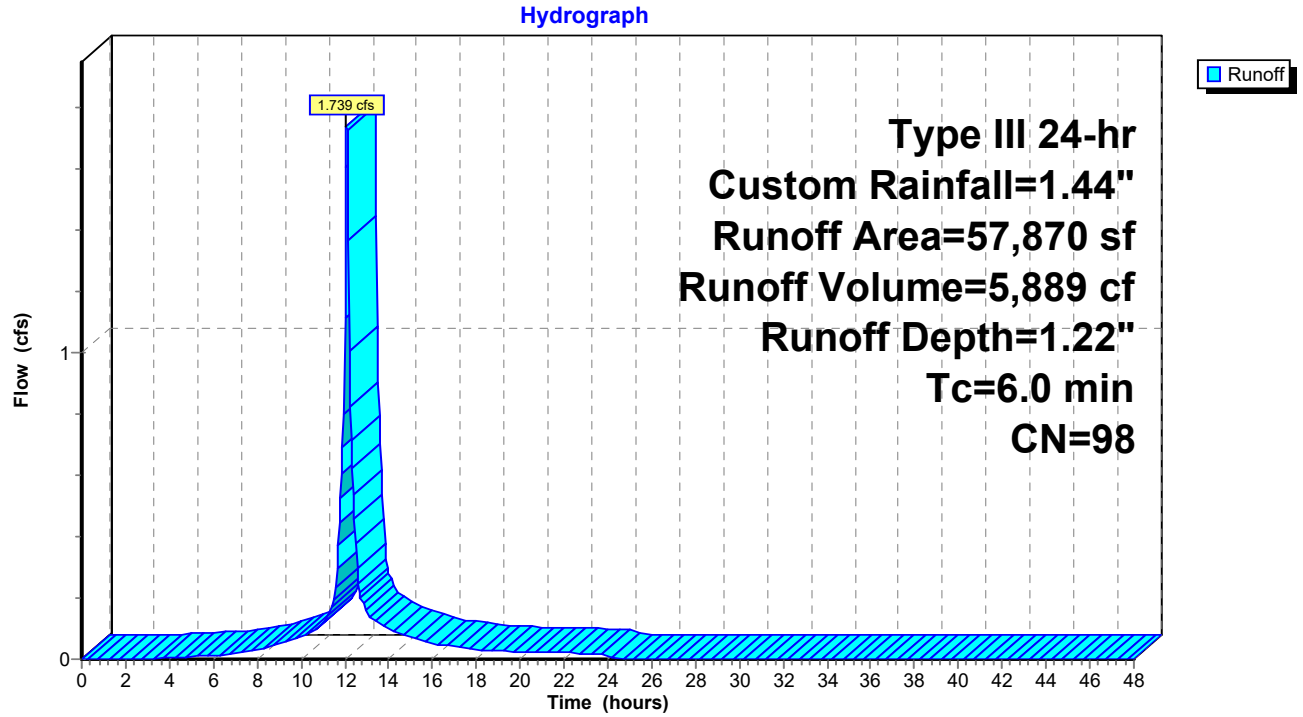
Runoff = 1.739 cfs @ 12.09 hrs, Volume= 5,889 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	57,870	98	Impervious
	57,870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6S: Warehouse Building Roof - East



Summary for Subcatchment 7S: Area South of Building

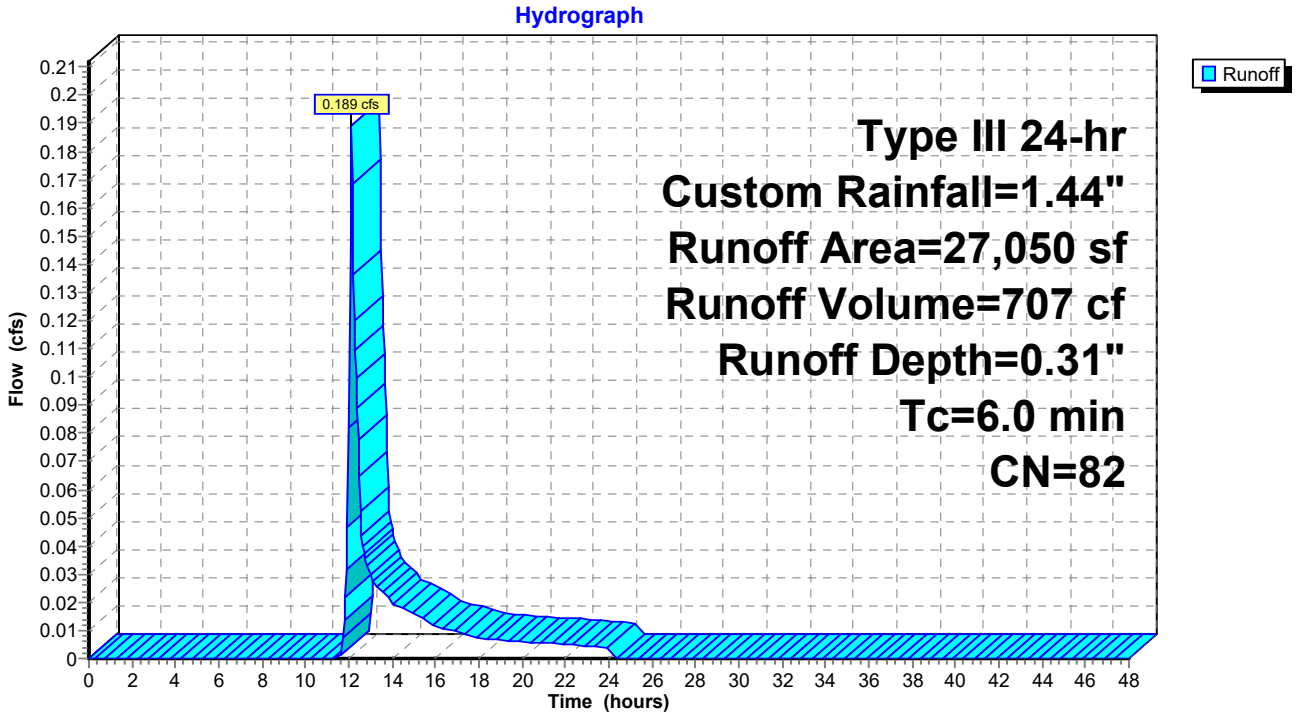
Runoff = 0.189 cfs @ 12.11 hrs, Volume= 707 cf, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	2,355	98	Impervious
	24,695	80	>75% Grass cover, Good, HSG D
	27,050	82	Weighted Average
	24,695		91.29% Pervious Area
	2,355		8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 7S: Area South of Building



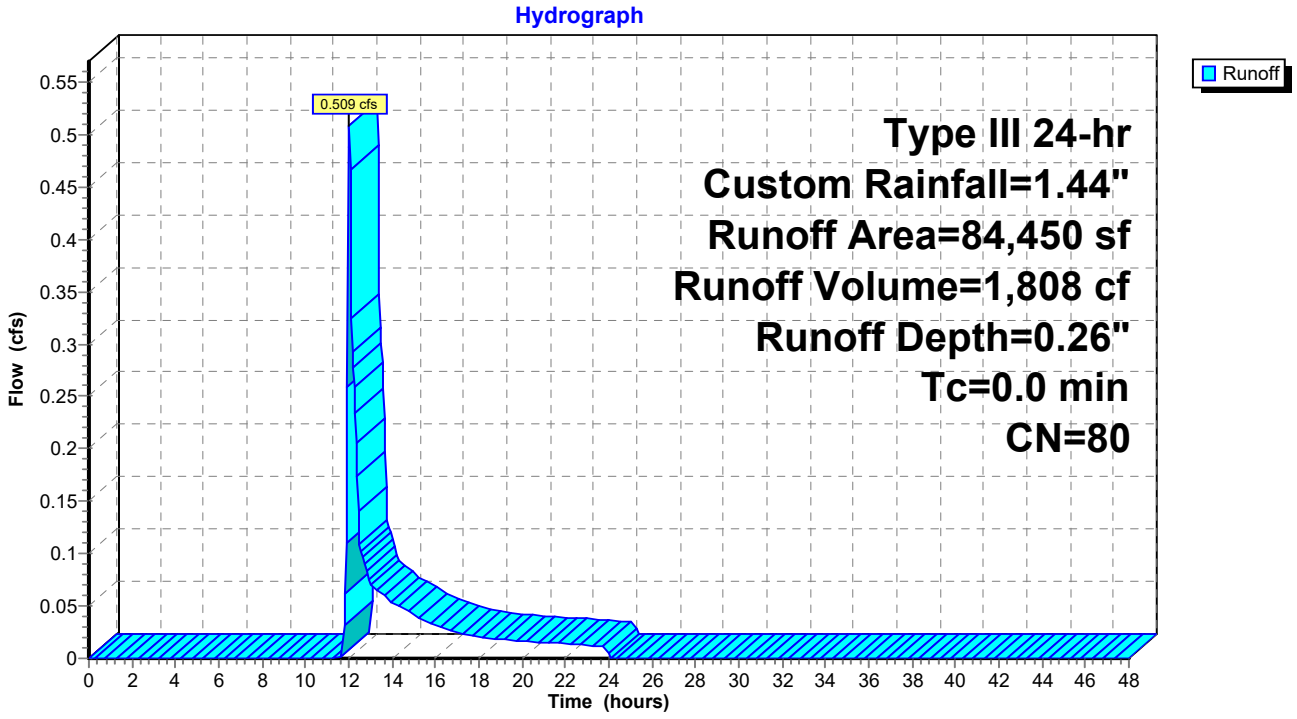
Summary for Subcatchment 8S: Western and Southern Edges of Site

Runoff = 0.509 cfs @ 12.02 hrs, Volume= 1,808 cf, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=1.44"

	Area (sf)	CN	Description
*	420	98	Impervious
	84,030	80	>75% Grass cover, Good, HSG D
	84,450	80	Weighted Average
	84,030		99.50% Pervious Area
	420		0.50% Impervious Area

Subcatchment 8S: Western and Southern Edges of Site



Summary for Pond 1P: R-Tank, StormFilter & OCS

Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth = 0.89" for Custom event
Inflow = 6.252 cfs @ 12.09 hrs, Volume= 20,659 cf
Outflow = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf, Atten= 95%, Lag= 168.1 min
Primary = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf
Secondary = 0.000 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 3.25' @ 14.89 hrs Surf.Area= 7,194 sf Storage= 14,538 cf
Flood Elev= 9.52' Surf.Area= 7,194 sf Storage= 30,079 cf

Plug-Flow detention time= 636.5 min calculated for 20,586 cf (100% of inflow)
Center-of-Mass det. time= 635.7 min (1,438.6 - 802.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.81'	5,213 cf	**Stone Envelope (Prismatic)** Listed below (Recalc) 39,207 cf Overall - 26,174 cf Embedded = 13,033 cf x 40.0% Voids
#2	1.06'	24,866 cf	**R-Tank Triple Modules (Prismatic)** Listed below (Recalc) Inside #1 26,174 cf Overall x 95.0% Voids
		30,079 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.81	7,194	0	0
6.26	7,194	39,207	39,207

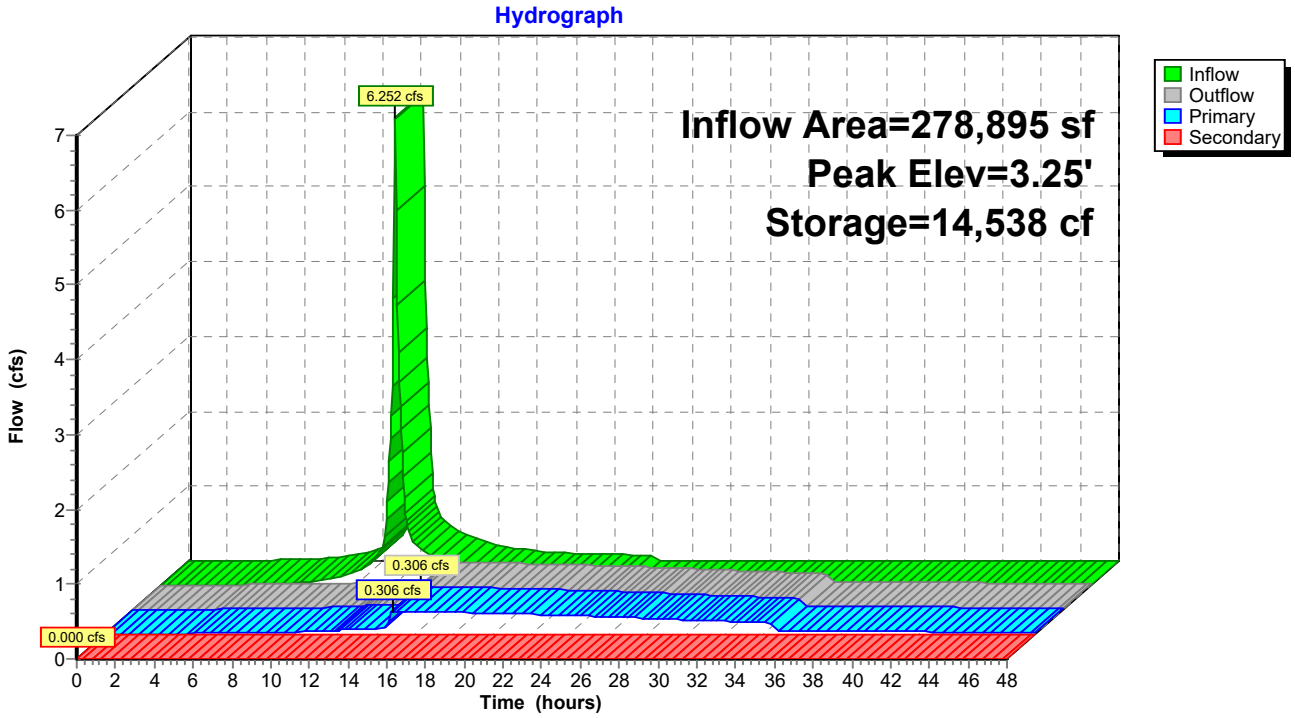
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.06	6,232	0	0
5.26	6,232	26,174	26,174

Device	Routing	Invert	Outlet Devices
#1	Primary	0.56'	**12.0" Round Culvert to DMH4** L= 4.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.56' / 0.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	0.56'	**SF - Tube/Siphon/Float Valve X 28.00** Starts@3.31' Breaks@1.23' 0.504" Diameter, C= 0.600, 0.263" Trickle Diameter
#3	Secondary	1.06'	**30.0" Round Bypass Culvert** L= 6.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1.06' / 0.85' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#4	Device 3	3.81'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.083 cfs @ 14.89 hrs HW=3.25' TW=0.55' (Dynamic Tailwater)
└─**1=Culvert to DMH4** (Passes 0.083 cfs of 4.420 cfs potential flow)
└─**2=SF - Tube/Siphon/Float Valve** (Orifice Controls 0.083 cfs @ 7.90 fps)

Secondary OutFlow Max=0.000 cfs @ 0.00 hrs HW=0.81' TW=0.31' (Dynamic Tailwater)
└─**3=Bypass Culvert** (Controls 0.000 cfs)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Pond 1P: R-Tank, StormFilter & OCS



Summary for Pond 2P: DMH-4

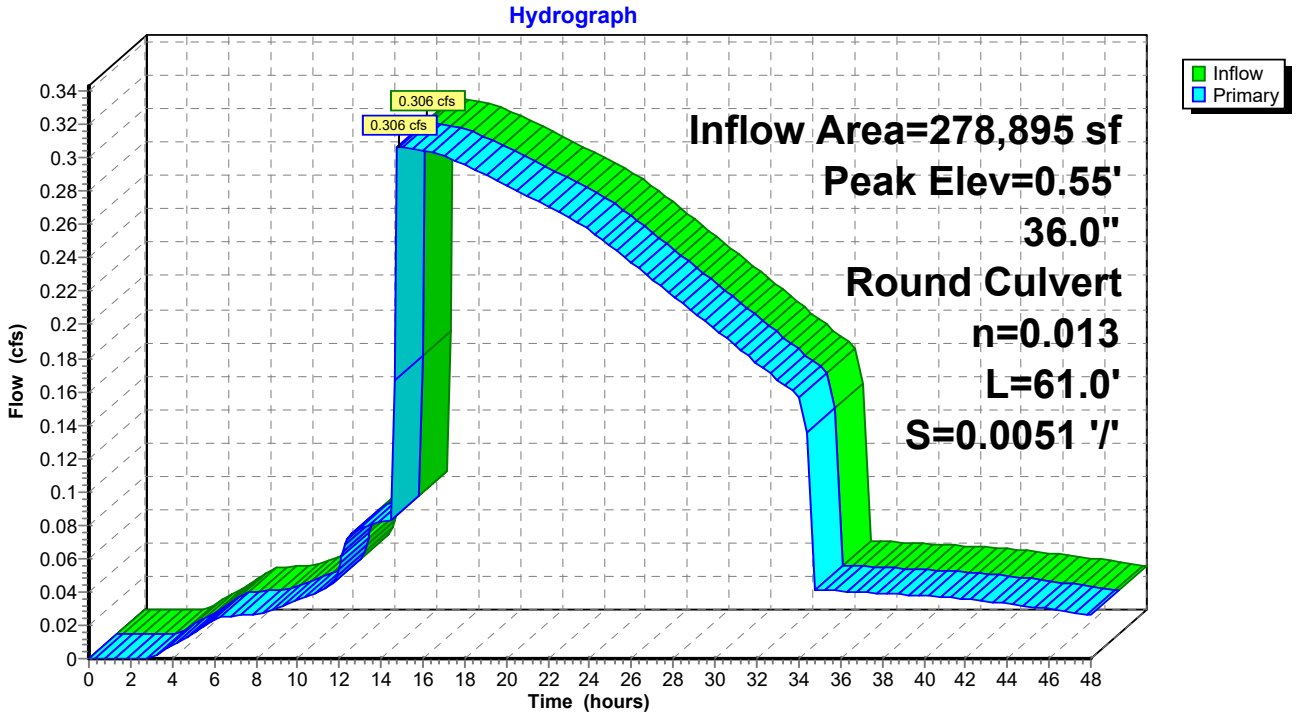
Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth > 0.89" for Custom event
Inflow = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf
Outflow = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 0.55' @ 14.89 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.31'	**36.0" Round Culvert** L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.31' / 0.00' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=0.306 cfs @ 14.89 hrs HW=0.55' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.306 cfs @ 1.81 fps)

Pond 2P: DMH-4

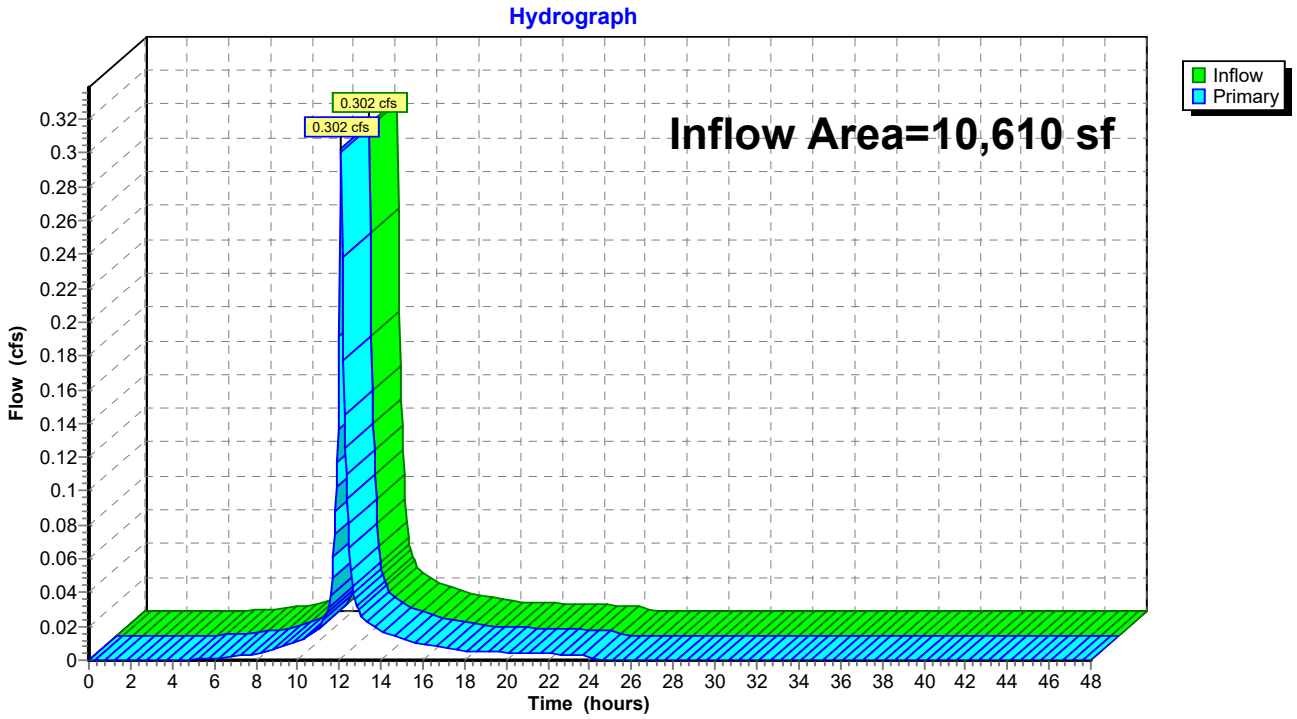


Summary for Link SP1: Commercial St Drainage

Inflow Area = 10,610 sf, 96.56% Impervious, Inflow Depth = 1.13" for Custom event
Inflow = 0.302 cfs @ 12.09 hrs, Volume= 995 cf
Primary = 0.302 cfs @ 12.09 hrs, Volume= 995 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP1: Commercial St Drainage

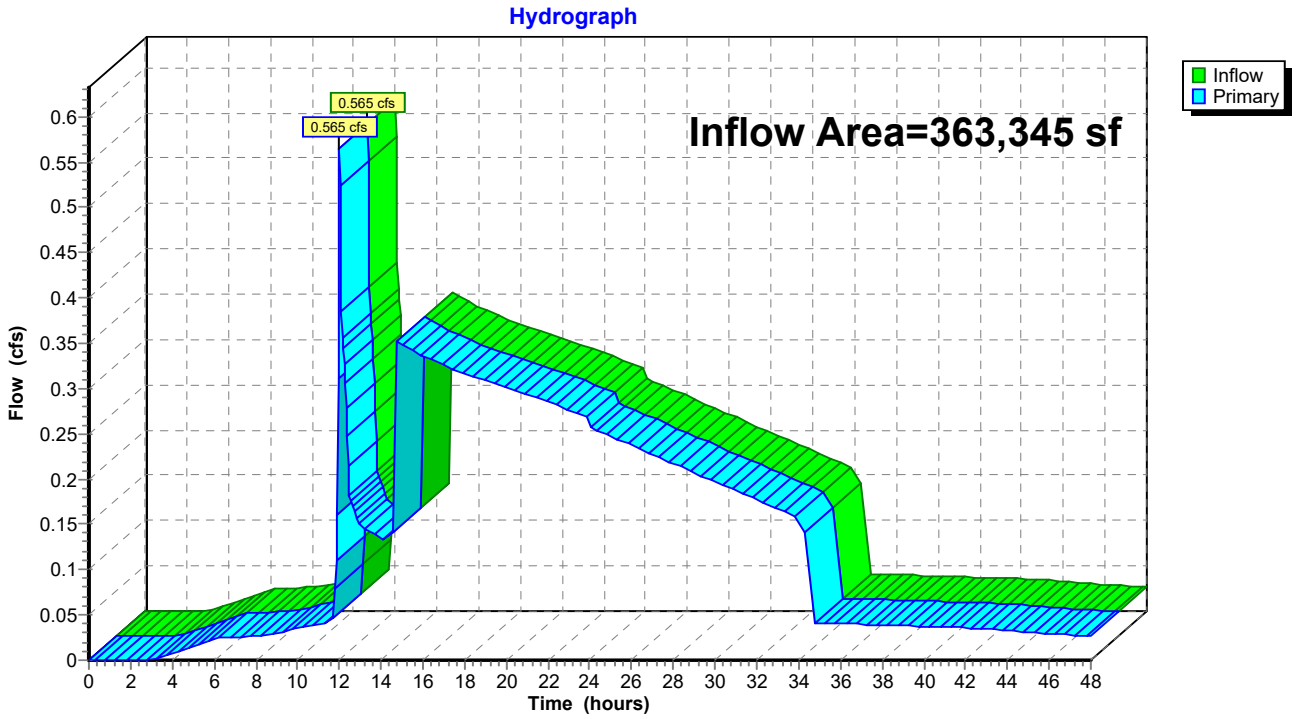


Summary for Link SP2: Fore River

Inflow Area = 363,345 sf, 57.06% Impervious, Inflow Depth > 0.74" for Custom event
Inflow = 0.565 cfs @ 12.02 hrs, Volume= 22,415 cf
Primary = 0.565 cfs @ 12.02 hrs, Volume= 22,415 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP2: Fore River



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Driveway Entrance Runoff Area=10,610 sf 96.56% Impervious Runoff Depth=1.13"
Tc=6.0 min CN=97 Runoff=0.302 cfs 995 cf

Subcatchment2S: Employee Parking Lot Runoff Area=29,100 sf 41.51% Impervious Runoff Depth=0.49"
Tc=6.0 min CN=87 Runoff=0.365 cfs 1,198 cf

Subcatchment3S: Eastern Parking Lot Runoff Area=115,360 sf 73.77% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=93 Runoff=2.478 cfs 7,827 cf

Subcatchment4S: Office Building Roof Runoff Area=17,085 sf 100.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=98 Runoff=0.514 cfs 1,739 cf

Subcatchment5S: Warehouse Building Runoff Area=32,430 sf 100.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=98 Runoff=0.975 cfs 3,300 cf

Subcatchment6S: Warehouse Building Runoff Area=57,870 sf 100.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=98 Runoff=1.739 cfs 5,889 cf

Subcatchment7S: Area South of Building Runoff Area=27,050 sf 8.71% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=82 Runoff=0.189 cfs 707 cf

Subcatchment8S: Western and Southern Runoff Area=84,450 sf 0.50% Impervious Runoff Depth=0.26"
Tc=0.0 min CN=80 Runoff=0.509 cfs 1,808 cf

Pond 1P: R-Tank, StormFilter & OCS Peak Elev=3.25' Storage=14,538 cf Inflow=6.252 cfs 20,659 cf
Primary=0.306 cfs 20,607 cf Secondary=0.000 cfs 0 cf Outflow=0.306 cfs 20,607 cf

Pond 2P: DMH-4 Peak Elev=0.55' Inflow=0.306 cfs 20,607 cf
36.0" Round Culvert n=0.013 L=61.0' S=0.0051 '/' Outflow=0.306 cfs 20,607 cf

Link SP1: Commercial St Drainage Inflow=0.302 cfs 995 cf
Primary=0.302 cfs 995 cf

Link SP2: Fore River Inflow=0.565 cfs 22,415 cf
Primary=0.565 cfs 22,415 cf

Total Runoff Area = 373,955 sf Runoff Volume = 23,462 cf Average Runoff Depth = 0.75"
41.82% Pervious = 156,370 sf 58.18% Impervious = 217,585 sf

Summary for Subcatchment 1S: Driveway Entrance

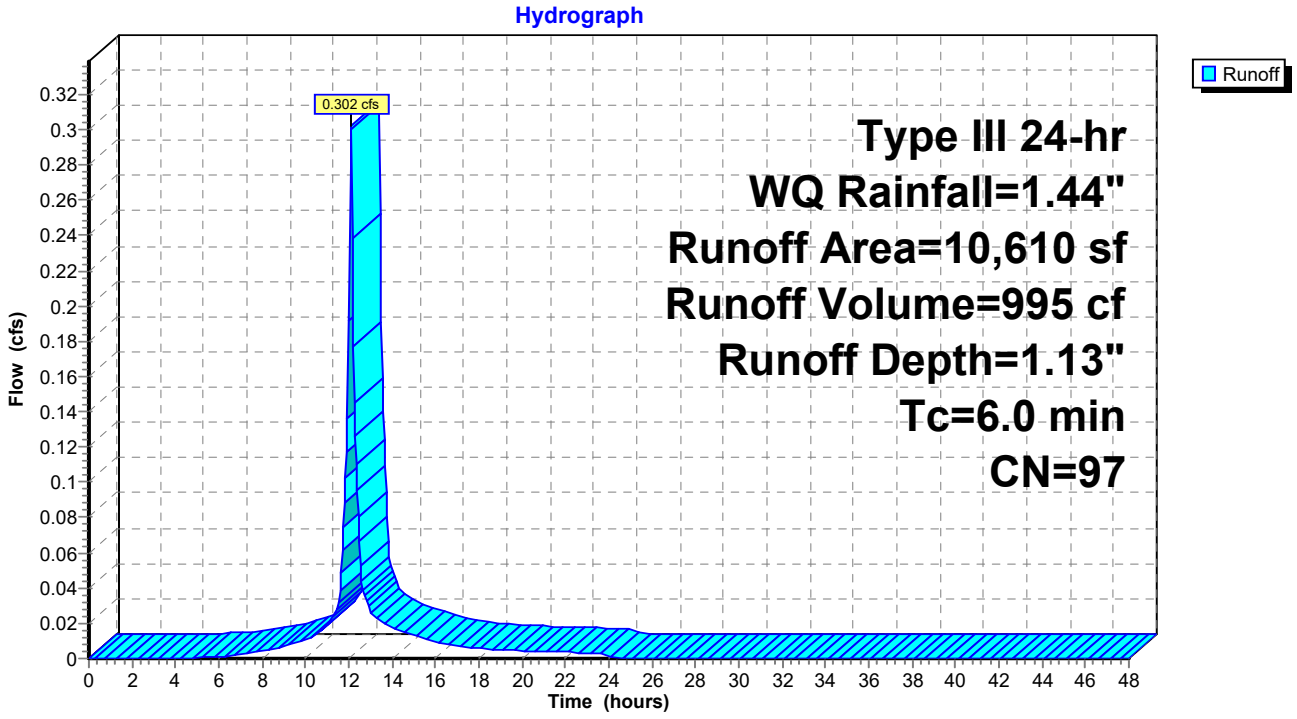
Runoff = 0.302 cfs @ 12.09 hrs, Volume= 995 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	10,245	98	Impervious
	365	80	>75% Grass cover, Good, HSG D
	10,610	97	Weighted Average
	365		3.44% Pervious Area
	10,245		96.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1S: Driveway Entrance



Summary for Subcatchment 2S: Employee Parking Lot

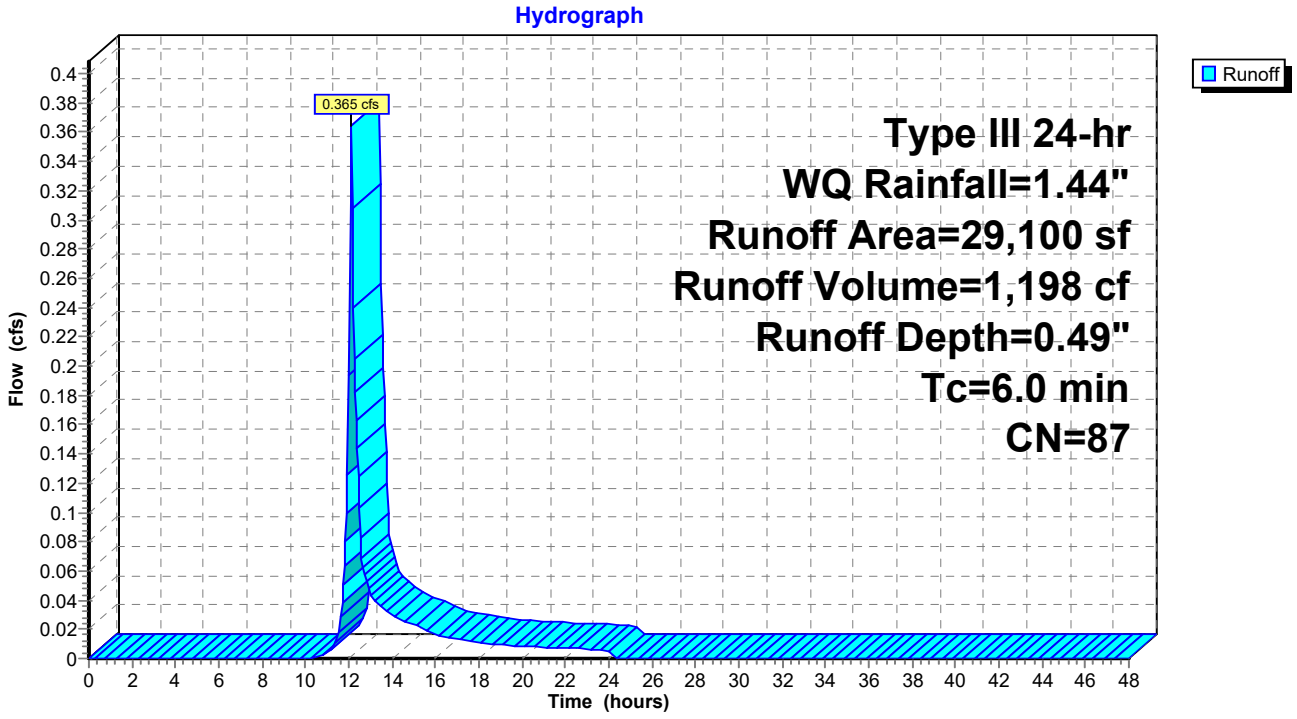
Runoff = 0.365 cfs @ 12.10 hrs, Volume= 1,198 cf, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	12,080	98	Impervious
	17,020	80	>75% Grass cover, Good, HSG D
	29,100	87	Weighted Average
	17,020		58.49% Pervious Area
	12,080		41.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Employee Parking Lot



Summary for Subcatchment 3S: Eastern Parking Lot and Loading Zone

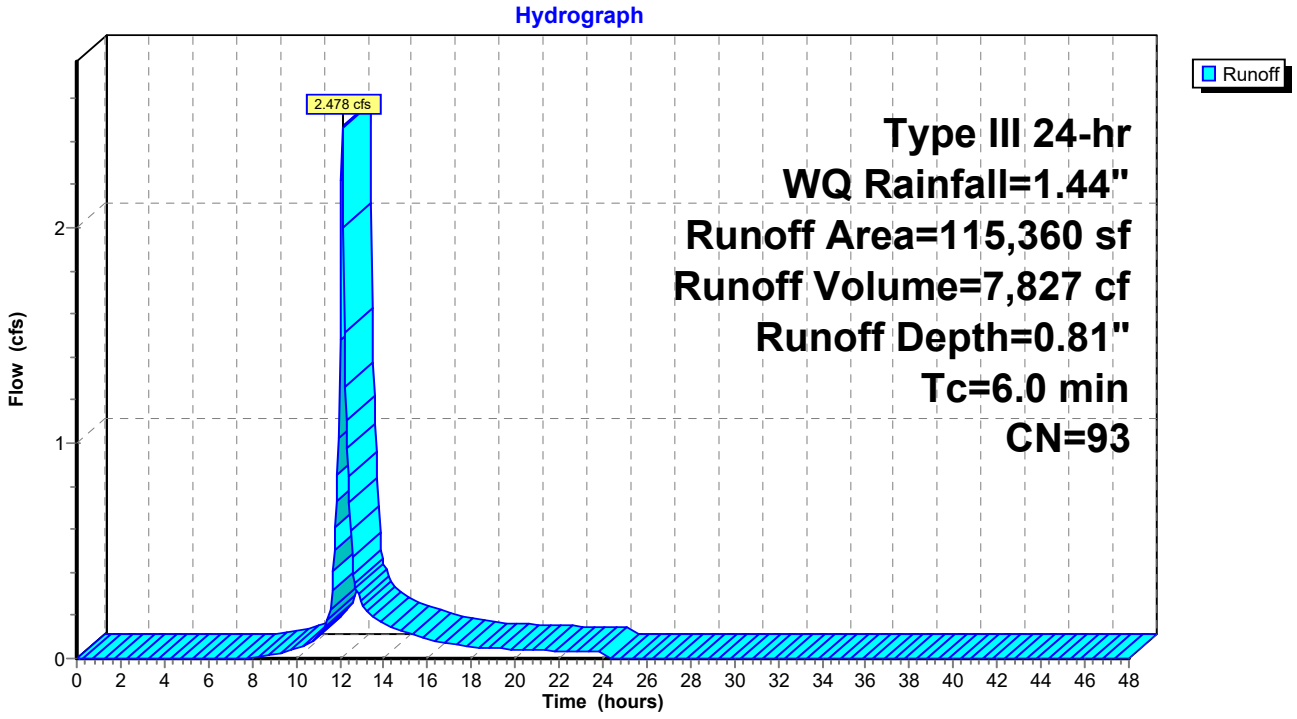
Runoff = 2.478 cfs @ 12.09 hrs, Volume= 7,827 cf, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	85,100	98	Impervious
	30,260	80	>75% Grass cover, Good, HSG D
	115,360	93	Weighted Average
	30,260		26.23% Pervious Area
	85,100		73.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 3S: Eastern Parking Lot and Loading Zone



Summary for Subcatchment 4S: Office Building Roof

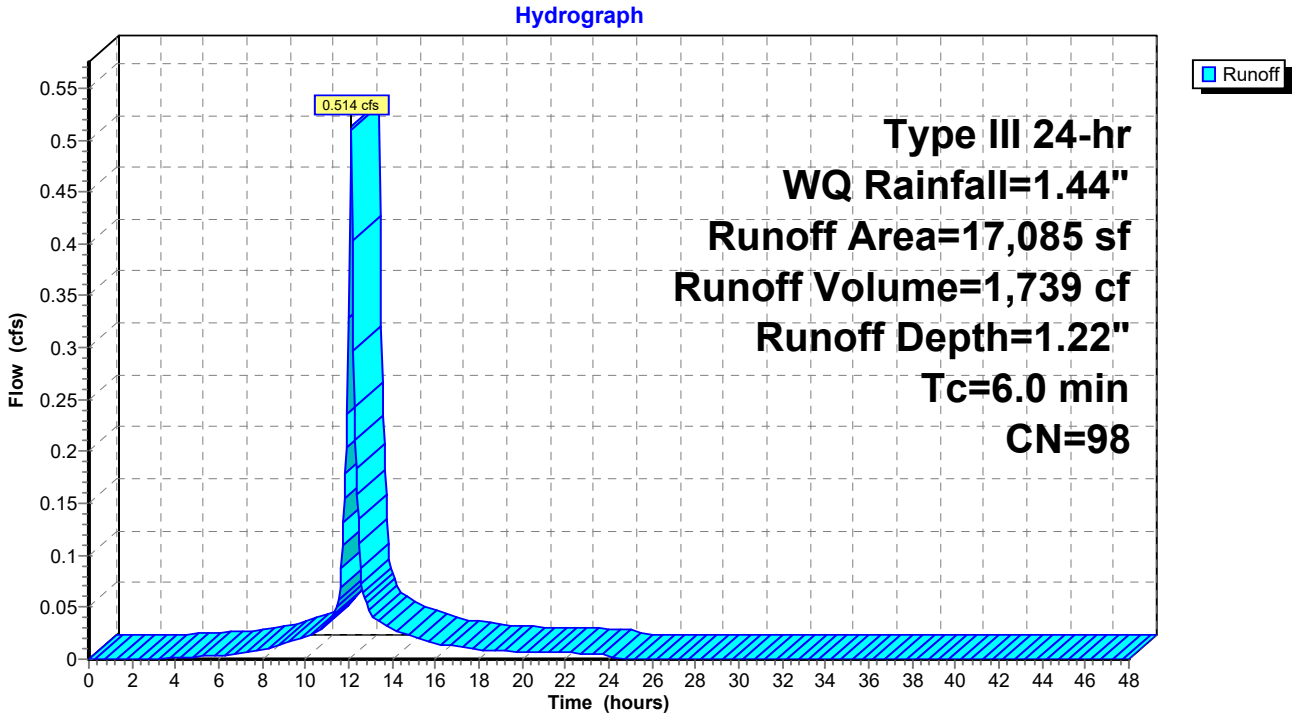
Runoff = 0.514 cfs @ 12.09 hrs, Volume= 1,739 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	17,085	98	Impervious
	17,085		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: Office Building Roof



Summary for Subcatchment 5S: Warehouse Building Roof - West

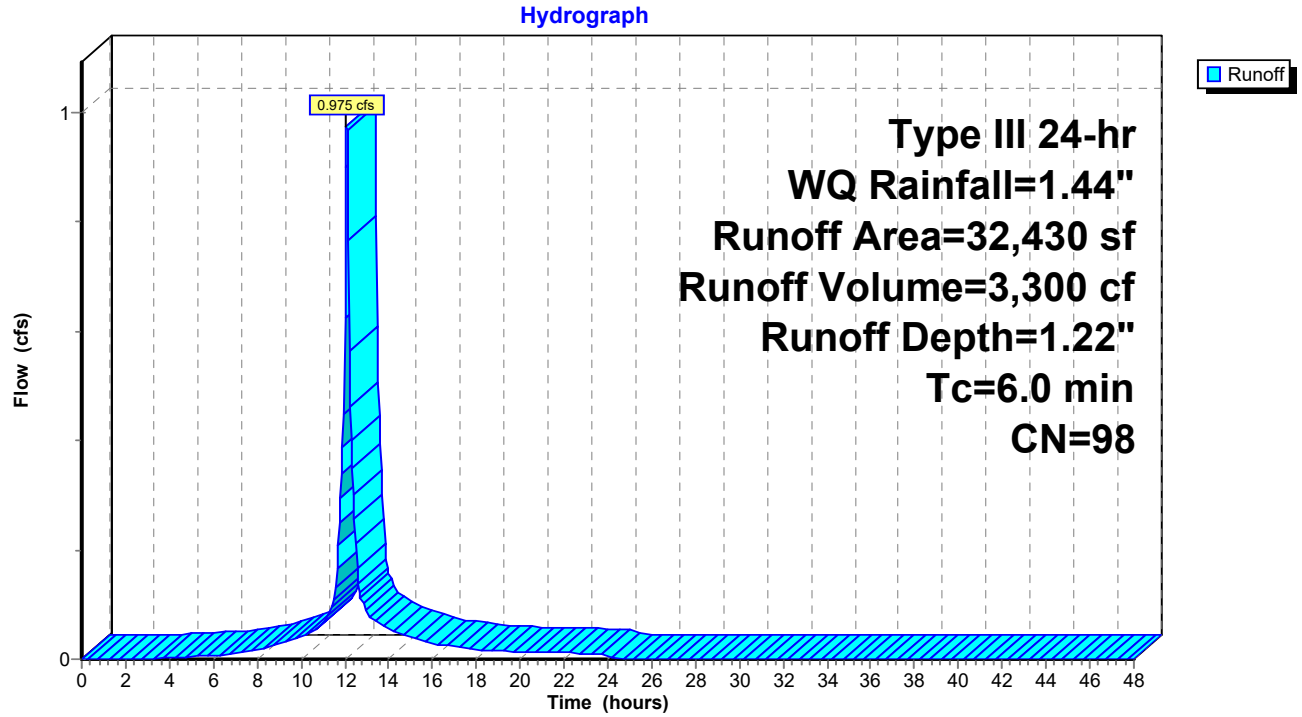
Runoff = 0.975 cfs @ 12.09 hrs, Volume= 3,300 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	32,430	98	Impervious
	32,430		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: Warehouse Building Roof - West



Summary for Subcatchment 6S: Warehouse Building Roof - East

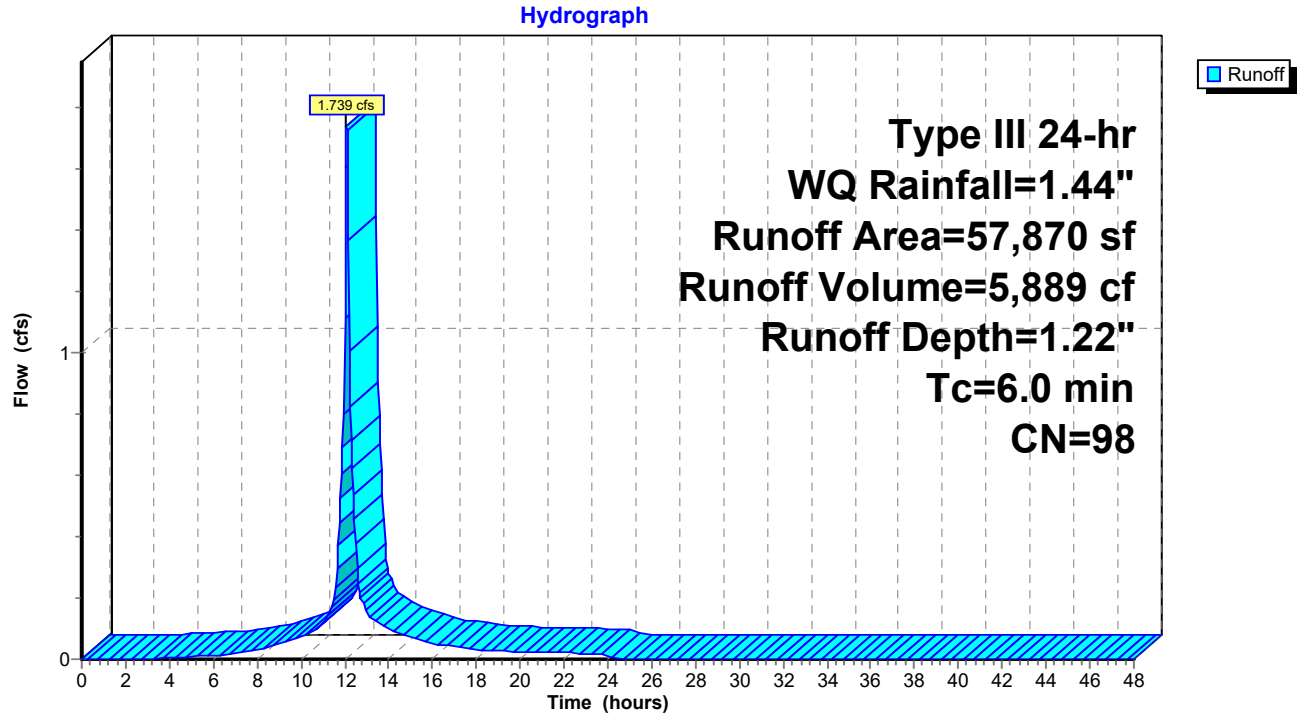
Runoff = 1.739 cfs @ 12.09 hrs, Volume= 5,889 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	57,870	98	Impervious
	57,870		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 6S: Warehouse Building Roof - East



Summary for Subcatchment 7S: Area South of Building

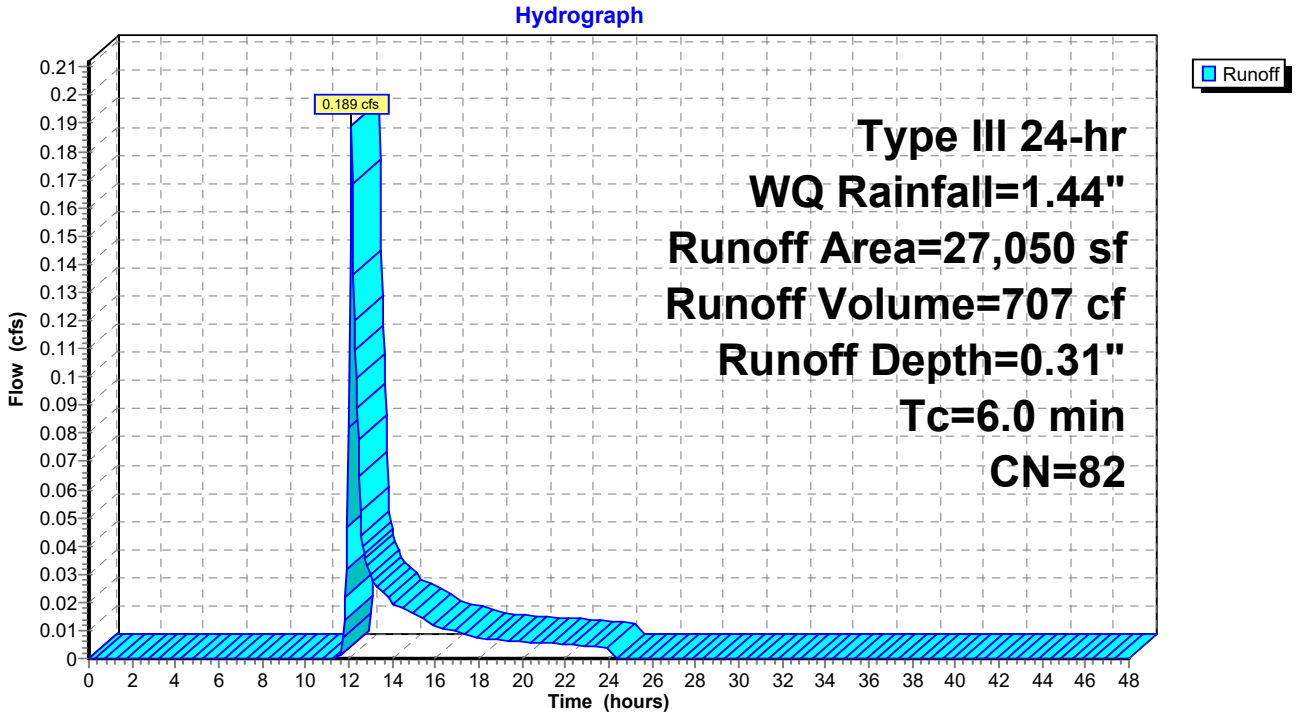
Runoff = 0.189 cfs @ 12.11 hrs, Volume= 707 cf, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	2,355	98	Impervious
	24,695	80	>75% Grass cover, Good, HSG D
	27,050	82	Weighted Average
	24,695		91.29% Pervious Area
	2,355		8.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 7S: Area South of Building



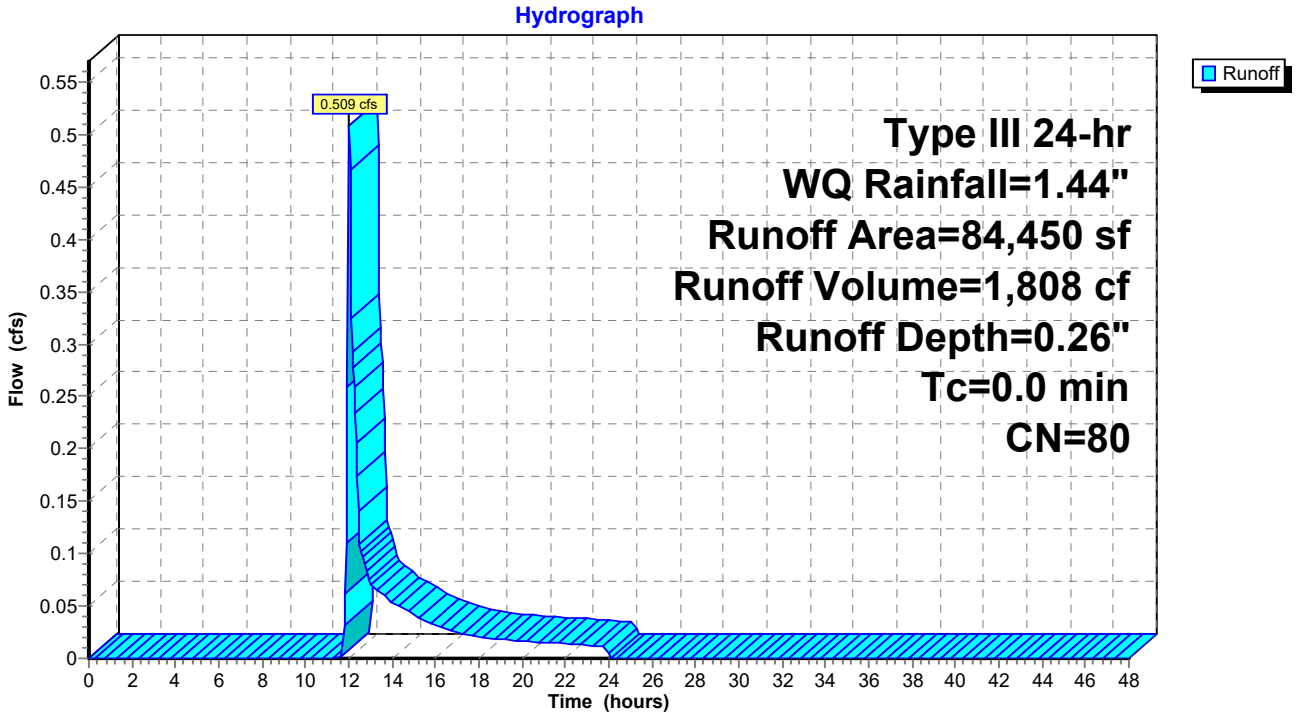
Summary for Subcatchment 8S: Western and Southern Edges of Site

Runoff = 0.509 cfs @ 12.02 hrs, Volume= 1,808 cf, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.44"

	Area (sf)	CN	Description
*	420	98	Impervious
	84,030	80	>75% Grass cover, Good, HSG D
	84,450	80	Weighted Average
	84,030		99.50% Pervious Area
	420		0.50% Impervious Area

Subcatchment 8S: Western and Southern Edges of Site



Summary for Pond 1P: R-Tank, StormFilter & OCS

Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth = 0.89" for WQ event
Inflow = 6.252 cfs @ 12.09 hrs, Volume= 20,659 cf
Outflow = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf, Atten= 95%, Lag= 168.1 min
Primary = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf
Secondary = 0.000 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 3.25' @ 14.89 hrs Surf.Area= 7,194 sf Storage= 14,538 cf
Flood Elev= 9.52' Surf.Area= 7,194 sf Storage= 30,079 cf

Plug-Flow detention time= 636.5 min calculated for 20,586 cf (100% of inflow)
Center-of-Mass det. time= 635.7 min (1,438.6 - 802.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.81'	5,213 cf	**Stone Envelope (Prismatic)** Listed below (Recalc) 39,207 cf Overall - 26,174 cf Embedded = 13,033 cf x 40.0% Voids
#2	1.06'	24,866 cf	**R-Tank Triple Modules (Prismatic)** Listed below (Recalc) Inside #1 26,174 cf Overall x 95.0% Voids
		30,079 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.81	7,194	0	0
6.26	7,194	39,207	39,207

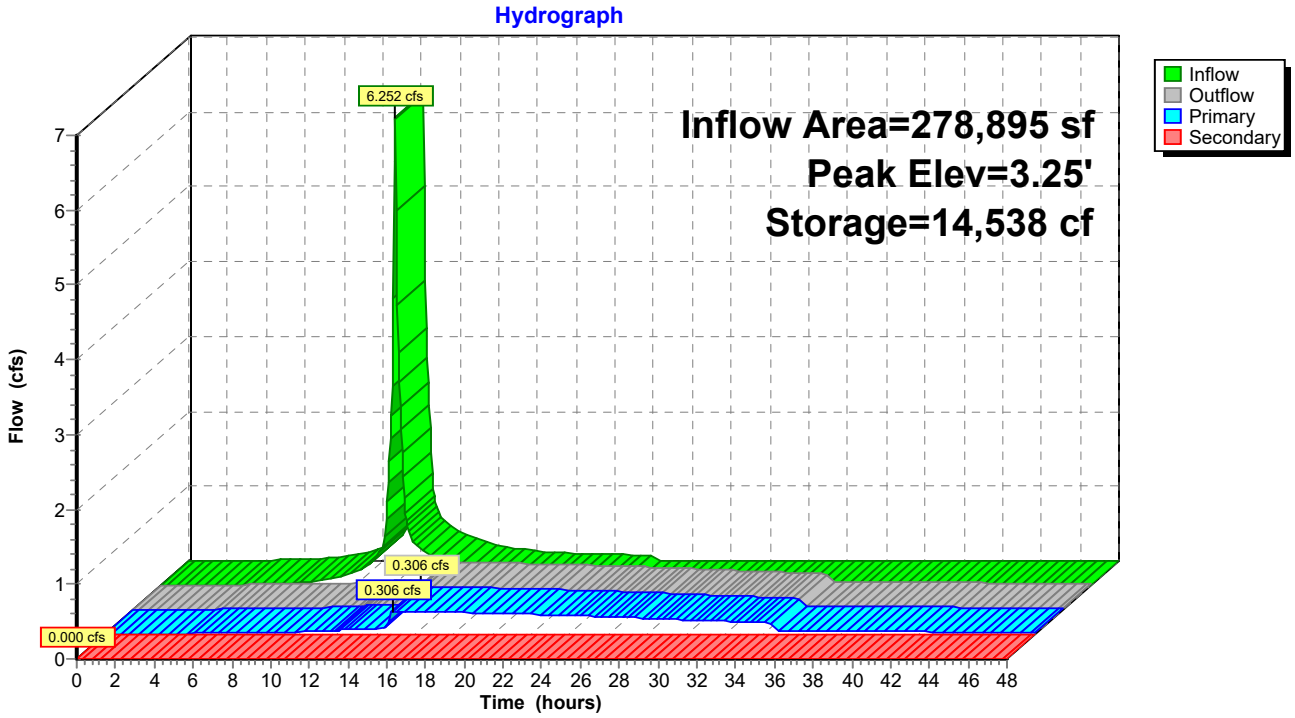
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.06	6,232	0	0
5.26	6,232	26,174	26,174

Device	Routing	Invert	Outlet Devices
#1	Primary	0.56'	**12.0" Round Culvert to DMH4** L= 4.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.56' / 0.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	0.56'	**SF - Tube/Siphon/Float Valve X 28.00** Starts@3.31' Breaks@1.23' 0.504" Diameter, C= 0.600, 0.263" Trickle Diameter
#3	Secondary	1.06'	**30.0" Round Bypass Culvert** L= 6.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1.06' / 0.85' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#4	Device 3	3.81'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.083 cfs @ 14.89 hrs HW=3.25' TW=0.55' (Dynamic Tailwater)
└─**1=Culvert to DMH4** (Passes 0.083 cfs of 4.420 cfs potential flow)
└─**2=SF - Tube/Siphon/Float Valve** (Orifice Controls 0.083 cfs @ 7.90 fps)

Secondary OutFlow Max=0.000 cfs @ 0.00 hrs HW=0.81' TW=0.31' (Dynamic Tailwater)
└─**3=Bypass Culvert** (Controls 0.000 cfs)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Pond 1P: R-Tank, StormFilter & OCS



Summary for Pond 2P: DMH-4

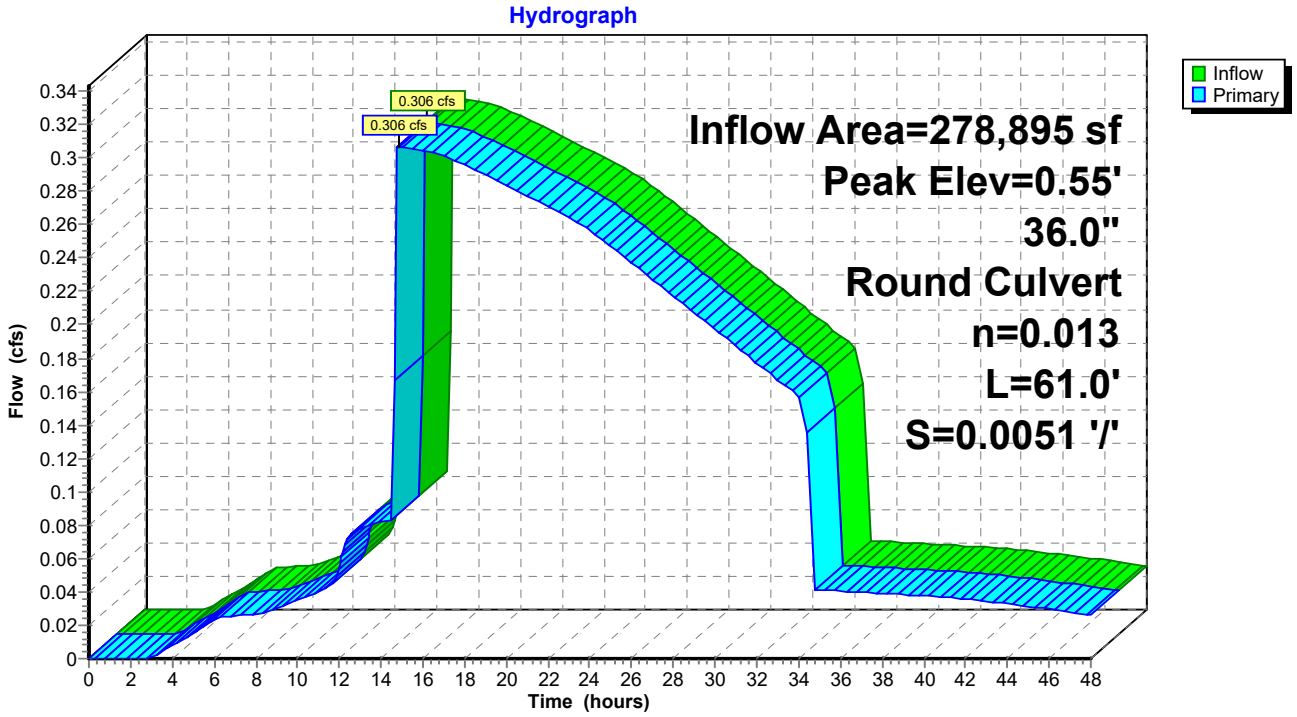
Inflow Area = 278,895 sf, 74.19% Impervious, Inflow Depth > 0.89" for WQ event
Inflow = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf
Outflow = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.306 cfs @ 14.89 hrs, Volume= 20,607 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 0.55' @ 14.89 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.31'	**36.0" Round Culvert** L= 61.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 0.31' / 0.00' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=0.306 cfs @ 14.89 hrs HW=0.55' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.306 cfs @ 1.81 fps)

Pond 2P: DMH-4

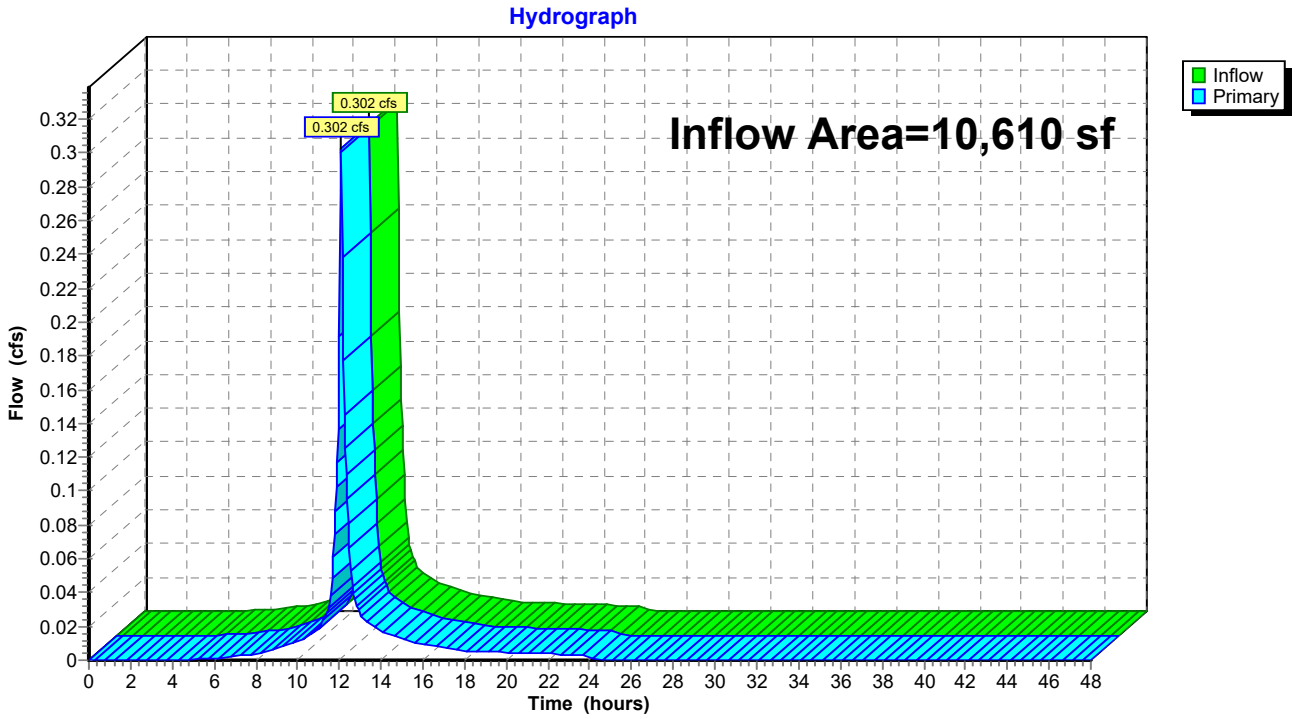


Summary for Link SP1: Commercial St Drainage

Inflow Area = 10,610 sf, 96.56% Impervious, Inflow Depth = 1.13" for WQ event
Inflow = 0.302 cfs @ 12.09 hrs, Volume= 995 cf
Primary = 0.302 cfs @ 12.09 hrs, Volume= 995 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP1: Commercial St Drainage

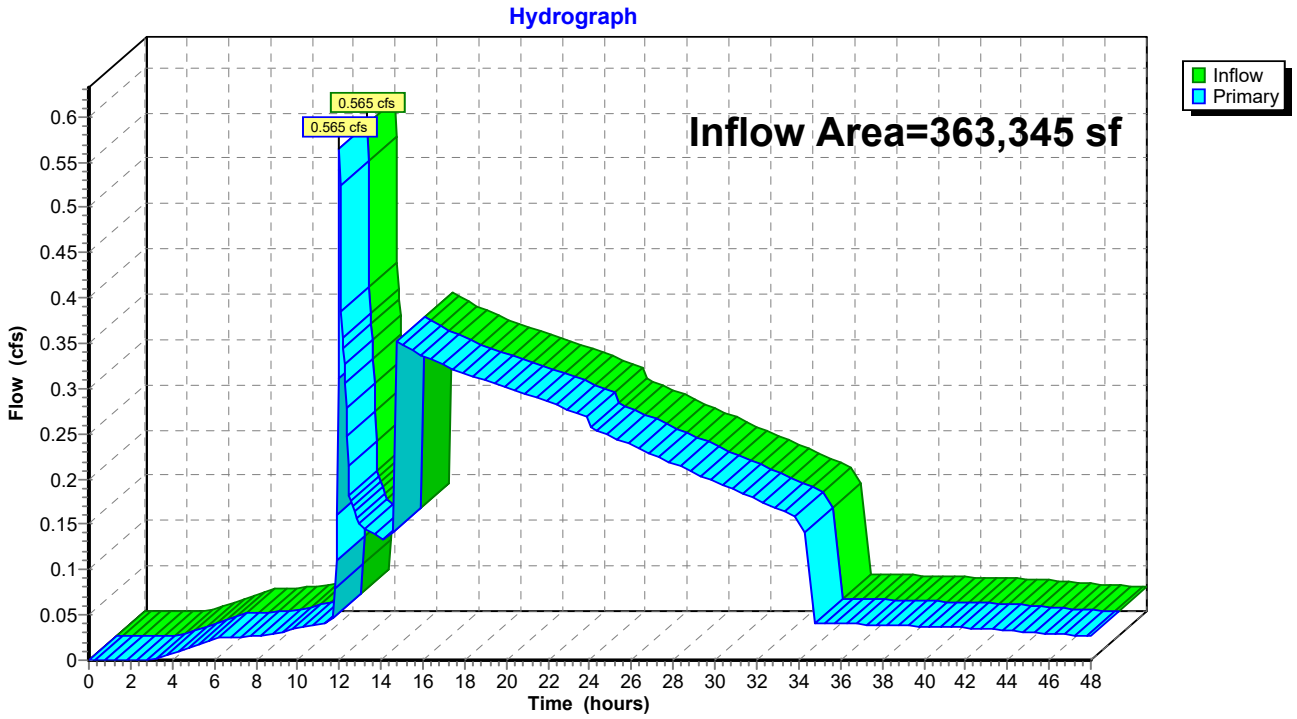


Summary for Link SP2: Fore River

Inflow Area = 363,345 sf, 57.06% Impervious, Inflow Depth > 0.74" for WQ event
Inflow = 0.565 cfs @ 12.02 hrs, Volume= 22,415 cf
Primary = 0.565 cfs @ 12.02 hrs, Volume= 22,415 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link SP2: Fore River



42x30 SHEET
1:1

WEST COMMERCIAL STREET
U.S. ROUTE 1A
PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST.

LAND NOW OR FORMERLY
OWNED BY
NEW YARD, LLC
30887/247

1S
2S
3S
4S
5S
6S
7S
8S
SP1
SP2
1P
2P

LEGEND
XX SUBCATCHMENT AREAS
DRAINAGE AREA
SPX STUDY POINT
XX POND

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

ISSUE FOR BID - NOT FOR CONSTRUCTION

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
	03/27/20 1105 - STORM Pro	

REV	DESCRIPTION	DATE
	DESIGNED BY: ANL DRAWN BY: JEC	

DRAINAGE AREA FIGURE

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL
COLD STORAGE FACILITY

JOB NO.: 232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 1 OF 1

Drainage

WEST COMMERCIAL STREET
U.S. ROUTE 1A
PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST.

REDEVELOPMENT AREA

LAND NOW OR FORMERLY
OWNED BY
NEW YARD, LLC
30887/247

FORE RIVER

HIGHEST ANNUAL TIDE
LINE ELEVATION 7.2
NGVD 1929

FORMER HARBOR COMMISSIONERS' LINE OF 1923

250' FROM H.A.T.
SHORELAND ZONE

EXISTING LIGHT TO REMAIN

30' WIDE SEWER EASEMENT TO CITY OF PORTLAND
31021/187
31378/333

20' WIDE CMP EASEMENT

ISSUE FOR BID - NOT FOR CONSTRUCTION

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LICENSED PROFESSIONAL ENGINEER

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	DESIGNED BY: ANL DRAWN BY: JEC CHECKED BY: DS	

REDEVELOPMENT FIGURE

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL
COLD STORAGE FACILITY

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

JOB NO.: 232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 1 OF 1

Redevelopment

TRAFFIC IMPACT STUDY

MAINE INTERNATIONAL COLD STORAGE FACILITY

PORTLAND, MAINE

August 25, 2020



Prepared For:

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The evolution of expertise

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INTRODUCTION

The purpose of this report is to summarize a traffic impact study for the proposed Maine International Cold Storage Facility (MICS). The cold storage facility will be located adjacent to the International Marine Terminal (IMT) on West Commercial Street in Portland, as shown on the map in Figure 1. The proposed cold storage facility will be 108,000 square feet (S.F.) in size. The facility is expected to employ a maximum of 25 employees, which will be spread over two primary shifts and a late night shift. Access to the facility will be provided by a single full movement signalized drive to West Commercial Street, directly opposite Beach Street, and by an internal connection to the IMT. The facility is projected to generate a maximum of 70 trucks per day or 140 one-way truck trips. The majority of these truck trips (75 %) are expected to occur between 6:00 AM and 12:00 noon with the remaining 25 % occurring in the afternoon. It is expected that the facility will reduce off-site truck trips from the adjacent IMT since there is no available cold storage at the IMT now.

Construction of the facility is expected to begin in late 2020 with completion and occupancy planned for 2022. Given this construction schedule, 2022 was selected as the study year for traffic analysis purposes.

TRIP GENERATION ANALYSIS

The number of trips to be generated by the proposed storage facility was estimated using the most recent Institute of Transportation Engineers (ITE) "Trip Generation, 10th Edition" report. The calculations were performed utilizing Land Use Code 150 - Warehousing on the basis of both employees and square footage. The results on the basis of 108,000 S.F. and 25 employees are summarized in the table below:

	10th Edition ITE (one-way trip ends)		
Time Period	Emp.	S.F.	Average
Weekday	126	188	158
AM Peak Hour – Adjacent Street	15	18	17
AM Peak Hour – Generator	17	24	21
PM Peak Hour – Adjacent Street	17	21	19
PM Peak Hour – Generator	17	26	22

As seen above, the employee and square footage bases yielded similar results so they were averaged to best estimate expected site trips.

SITE SPECIFIC ESTIMATES

Given the availability of specific truck and employee numbers, trip generation was also estimated specific to this site. The facility expects 53 trucks from 6:00 AM to noon, or 9 per hour. To allow for some peaking within that period, 12 trucks are assumed for this analysis, equal to 24 one-way truck trips. The ITE estimates on an employee basis appear reasonable for the facility even though those numbers would have included some trucks. Assuming 15 employee trips and 24 truck trips results in an AM peak hour estimate of 39 one-way trips. Only 17 trucks are anticipated in the afternoon period, from noon to 6:00 PM, which equates to approximately 3 trucks per hour. To allow for peaking within this slower period, 6 trucks are assumed during the PM peak hour with 15 employee trips for 21 PM peak hour trips. This PM estimate is virtually identical to the ITE result of 22, which will be utilized for the remainder of this analysis to be conservative.

PERMITTING REQUIREMENTS

The trips must be converted to passenger car equivalents (PCEs) to determine if a Traffic Movement Permit (TMP) is required under state law. For these calculations, each truck trip equals two PCES. The peak hour calculations are as follows:

AM Peak Hour – 24 trucks x 2.0 PCEs = 48 PCEs + 15 employee PCEs = 63 PCEs

PM Peak Hour – 7 trucks X 2.0 PCEs = 14 PCEs + 15 employee PCEs = 29 PCEs

Based upon these results, which are expected to be conservative, a TMP would not be required for the Cold Storage facility since peak hour trip generation will not exceed the 100-trip threshold, defined in terms of PCEs. However, the City of Portland has requested that trips generated by the adjacent IMT also be considered.

IMT TRIP GENERATION

Trips to and from the IMT were recorded in turning movement and classification counts performed in 2019 by Gorrill Palmer and Traffic Solutions. These counts were conducted as follows:

Intersection	Date/Count Period	Peak Hour
W. Commercial St, Beach St. & Site Drive	8/13/2019 7 – 9 AM	7:30 – 8:30 AM
W. Commercial St, Beach St. & Site Drive	8/13/2019 3 – 6 PM	4:45 - 5:45 PM
W. Commercial Street & IMT Drive	11/14/2019 7 – 9 AM	7:30 – 8:30 AM
W. Commercial Street & IMT Drive	11/14/2019 4 – 6 PM	4:30 – 5:30 PM

The counts were summarized in terms of passenger car equivalents for the AM and PM peak hours of both the adjacent street system and the peak hour of the IMT. The AM results are shown in Figure 2 while the PM results are summarized in Figure 3. As seen in these figures, during the AM peak hour of the IMT it generated 33 PCEs. During the PM peak hour of the IMT it generated 28 PCEs. These trips are added to the projected peak hours for the International Cold Storage Facility as follows:

AM Peak Hour – 63 PCEs Cold Storage + 33 PCEs IMT = 96 PCEs

PM Peak Hour –29 PCEs Cold Storage + 28 PCEs IMT = 57 PCEs

As seen above, the maximum PCEs for the entire combined site after development of the cold storage facility will be 96 during the AM peak hour and 57 during the PM peak hour. These estimates are expected to be conservative since they are based upon the following assumptions:

- Both the IMT and Cold Storage facilities will peak during the exact same hours of the day
- Both the employee trips and truck trips for the cold storage facility will peak during the same hours
- The cold storage facility will reduce off-site trips from the IMT since there is no cold storage currently available
- The analysis allowed for peaking in truck traffic while in practice the cold storage trips will be scheduled and more steady state

Given the above results, with the AM peak hour approaching the 100-PCE TMP threshold, additional information was requested by the City of Portland regarding IMT operations and expected growth. Specifically, additional information was requested regarding IMT shipping to determine if the traffic counts conducted in August and November of 2019 would be considered typical of average conditions. Additionally, the City was interested to know if the IMT facility was operating at projected full build out volumes in 2019 and what growth in their traffic numbers could be anticipated.

This information was provided to the City in a letter dated July 7th and the City concurred that a TMP is not required based upon this additional information, supplied by the Port, including an expected 30 % reduction in Port trucks due to the addition of the cold storage facility.

Based upon the trip generation results, and the finding that a TMP is not required, the study area was defined by the City as encompassing the intersection of West Commercial Street, Beach Street and the site drive. The expected AM and PM peak hour trips for the analysis are summarized in the following table:

COLD STORAGE TRIP GENERATION (one-way trip-ends)

Time Period	Passenger Vehicles	Trucks	Total Trips
AM Peak Hour – Adjacent Street	15	24	39
Entering	11	12	23
Exiting	4	12	16
PM Peak Hour – Adjacent Street	15	7	22
Entering	5	3	8
Exiting	10	4	14

The trip assignments were based upon the passenger vehicle and truck patterns recorded during the turning movement counts at the IMT drives. The resulting trip assignments are shown in Figures 4 and 5 for the AM and PM peak hour analysis periods.

TRAFFIC VOLUMES

As previously noted, turning movement counts were performed at the study area intersection by Traffic Solutions in 2019 for the "Traffic Impact Study for Proposed Department of Veteran Affairs, Community Based Outpatient Clinic". This study was performed by William Bray, P.E. and was dated Revised April 5, 2020. The counts are summarized below and the count records are included in the appendix:

Intersection	Date/Count Period	Peak Hour
Commercial, Beach & Site Drive	8/13/2019 7 – 9 AM	7:30 – 8:30 AM
Commercial, Beach & Site Drive	8/13/2019 3 – 6 PM	4:45 - 5:45 PM

Existing average annual daily traffic (AADT) data for the vicinity of the site was obtained from "Traffic Volume Counts, 2017 and 2014 Annual Reports", published by MaineDOT. This data is summarized as follows:

	Average Annual Daily Traffic		
Location	2010	2013	2016
West Commercial Street, east of Cassidy Point	19,000	20,890	20,430
Commercial Street, southwest of Park Street	---	---	17,320
Commercial Street, southwest of High Street	13,820	15,460	14,330

As demonstrated above, traffic volumes in the vicinity of the site have increased at an annual rate of less than 1 % during the period 2010 to 2016 period. Hence, based upon this historical data, a 1 % annual growth rate would have been utilized by Sewall to project the 2019 volumes to base 2022 conditions. It is noted that the volumes developed in the Bray VA Clinic study also utilized a 1 % annual traffic growth rate. The VA Clinic study included volumes from ten other recently approved developments within the VA Clinic study area. The City of Portland has directed Sewall to build upon these VA volumes so that these other developments, as well as

the VA clinic, are considered in the cold storage analysis. The VA volumes were developed for the same 2022 study year as the cold storage facility. Hence, the VA Clinic's Post Development 2022 volumes are the same as the 2022 No Build volumes for the Maine International Cold Storage facility. These No Build volumes are shown in Figures 6 and 7. Lastly, the projected Build volumes with the cold storage at full operations are shown in Figures 8 and 9. It is important to note that no reduction was made for the 30 % reduction in trucks entering and exiting the IMT to be conservative.

ACCIDENT REVIEW

The Maine Department of Transportation uses two criteria to determine high crash locations (HCLs). The first is the critical rate factor (CRF), which is a measure of the accident rate. A CRF greater than one indicates a location which has a higher than expected crash rate. The expected rate is calculated as a statewide average of similar facilities.

The second criterion, which must also be met, is based upon the number of accidents that occur at a particular location. Eight or more accidents must occur over the three-year study period for the location to be considered a high crash location. Accident data was obtained from MaineDOT for Commercial Street and Beach Street in the vicinity of the site and is included in the appendix. The CRF and number of accidents are summarized by location for the most recent three-year period, 2017 to 2019, in the following table:

Location Description	# of Acc.	CRF
West Commercial between Beach Street and 0.29 mile west	11	0.45
Intersection of West Commercial Street and Beach Street	28	1.02
West Commercial Street between Beach Street and Commercial Street	4	0.43
Beach Street between West Commercial Street and Clark/York Streets	0	0.00

As seen above, there is one high crash location in the vicinity of the site, the signalized intersection of West Commercial Street, Beach Street and the site drive. An analysis in the Bray Traffic Impact Study for the VA Clinic found that the intersection had a CRF of 1.17 and 30 crashes during the 2016 – 2018 3-year period. The data for the most recent 3-year period has a CRF of 1.02 (just over 1.00) with 28 reported accidents. The Bray study found a pattern of rear-end crashes between through vehicles on West Commercial Street. Additionally, it identified a minor pattern of four crashes involving left turns off Commercial Street onto Beach Street.

An updated collision diagram was obtained from MaineDOT for the more recent 2017 – 2019 period. That collision diagram is included in the appendix of this report. The diagram shows a continued pattern of crashes involving through vehicles on West Commercial Street, with 19

crashes being of this type. Due to the left-turn lanes on the mainline this crash pattern is generally considered uncorrectable provided the clearance times for the traffic signal are appropriate. There were six angle collisions involving left turns onto Beach Street, also constituting a pattern and a small increase from the 2016 – 2018 period.

The VA Clinic project will be making improvements at this intersection to improve safety. Specifically the project will:

- Provide “No Right Turn on Red” Blank Out sign for the Beach Street approach given that vehicles often take inadequate gaps.
- Provide “Red Signal Ahead” advance traffic light warning sign on the outside of the curve for westbound Commercial Street traffic to reduce the rear-end potential.
- Provide improved directional signage on West Commercial Street in advance of the left turn lane to Beach Street with guidance to Casco Bay Bridge and the Old Port to potentially reduce rear-ends in this direction.

Additionally, the Bray report suggested that the City may want to consider protected only left turn phasing for the turns onto Beach Street if that crash pattern becomes more predominant. Currently, the left turn operates as protected-permitted. The impacts of this potential change in signal phasing will be evaluated in the capacity analysis.

CAPACITY ANALYSIS

Traffic operations are evaluated in terms of level of service (LOS). Level of service is a qualitative measure that describes operations by letter designation. The levels range from A - very little delay to F - extreme delays. Level of service "D" is generally considered acceptable in urban locations while LOS "E" is generally considered the capacity of a facility and the minimum tolerable level. The level of service for signalized intersections is based upon the average control or signal delay per vehicle. These criteria are defined in the following table excerpted from the 2010 "Highway Capacity Manual":

Signalized Intersection Level of Service

LOS	Delay Range
A	< = 10.0 seconds
B	> 10.0 and <= 20.0
C	> 20.0 and <= 35.0
D	> 35.0 and <= 55.0
E	> 55.0 and <= 80.0
F	> 80.0

SIGNALIZED INTERSECTION ANALYSIS

The level of service (LOS) was calculated for the signalized access intersection of West Commercial Street and Beach Street for projected 2022 No Build and Build conditions using Synchro 10/SimTraffic. The signal timings and phasings from the Bray study for 2022 conditions were optimized so the timings for this anlaysis were similarly optimized. The City also requested analysis of providing Adaptive Signal Control at this intersection so the optimization best represents adaptive control. The capacity analysis accounted for the planned "No Right Turn on Red" blank out sign for Beach Street by reducing the right-turns on red accordingly. The average of the results of five (5) SimTraffic runs for No Build and Build conditions are provided in the appendix and are summarized in the following tables:

West Commercial, Beach and Site Drive
AM Peak Hour Level of Service

Approach	No Build 2022	Build 2022
Eastbound West Commercial	B (16.3)	C (21.8)
Westbound West Commercial	C (20.9)	D (39.1)
Northbound Site Drive	D (38.7)	E (65.6)
Southbound Beach	D (47.3)	D (38.6)
Intersection Overall	**B (18.2)**	**C (29.3)**

PM Peak Hour Level of Service

Approach	No Build 2022	Build 2022
Eastbound West Commercial	D (44.5)	D (44.1)
Westbound West Commercial	F (95.5)	F (96.7)
Northbound Site Drive	F (87.8)	F (124.5)
Southbound Beach	F (126.3)	F (132.8)
Intersection Overall	**E (69.1)**	**E (71.5)**

As shown above, the signalized intersection of West Commercial Street, Beach Street and the site drive is expected to operate at an overall LOS "C", with all road approaches at LOS "D" or better during the AM peak hour under Build volumes. The site drive will operate at a LOS "E" but given the minor volumes this is desirable to preserve capacity for the mainline. This indicates that there are no capacity concerns during the AM peak hour, which is expected to be the busiest peak hour (versus PM peak hour) for the cold storage facility.

The intersection is projected to be constrained at an overall LOS "E" for the PM peak hour, under both No Build and Build condition, given 1 % annual traffic growth and the other approved development projects. Several approaches will operate with extensive delays, at LOS "F", based upon the analysis. Given that this intersection has been built to its maximum desirable lanes and given the multi-modal complete streets aspects, providing bicycle lanes and pedestrian amenities, there is little that can be done to the intersection configuration to improve operations and lessen these delays. It is important to note that the proposed cold storage facility will have minimal impact on operations at this intersection during the constrained PM peak hour, with similar delays and LOS for all approaches, with the exception of the site drive given the increase in site volumes, as well as overall.

Modification of the signal to adaptive control is recommended, due to the large directional shifts between AM and PM peak hours and given that the intersection is capacity constrained during the PM peak hour. During the AM peak hour, there are 1,256 eastbound through movements and 810 westbound through movements. These volumes are essentially flipped during the PM peak hour with 860 eastbound through movements and 1,251 westbound movements. Additionally, it is expected that weekend patterns and Old Port and Portland events add to the variation in daily and hourly traffic flows, which favors adaptive control.

As previously noted, the Bray VA Clinic study suggested that protected only left-turn phasing for eastbound traffic (versus the current permitted/protected) be evaluated to reduce the angle collisions occurring between left turns onto Beach Street and westbound Commercial Street traffic. The overall impact on delays for Build volumes for the protected-only left option is summarized below:

	West Commercial, Beach and Site Drive Build 2022 Peak Hour Level of Service with Protected Left-Turn Phasing	
Approach	AM Peak Hour	PM Peak Hour
Eastbound West Commercial	C (26.6)	E (74.9)
Westbound West Commercial	D (48.5)	F (97.5)
Northbound Site Drive	D (52.2)	F (106.0)
Southbound Beach	D (54.5)	F (125.3)
Intersection Overall	**D (35.3)**	**F (87.2)**

The overall LOS for the intersection drops from "C" with 29.3 seconds of delay to "D" with 35.3 seconds of delay during the AM peak hour. The overall impact on operations during this time period is minor and the improvement in safety would be justified since operations would remain acceptable. During the PM peak hour, which is already constrained, the LOS would drop from "E" to "F" with a 16 second increase in delay. The City of Portland should determine if the potential reduction in crashes (a potential of six over the most recent three-year period) involving these left turns warrants the overall increases in delay.

QUEUE ANALYSIS

In addition to level of service, queues were also evaluated using SimTraffic, to assure that the cold storage facility will have minimal impact off-site on queue lengths and to evaluate existing turn lane storage lengths. The average of five (5) runs for projected 2022 No Build and Build conditions, with and without the protected only left-turn phasing, are summarized below:

AM Peak Hour - 95th Percentile Queues

Approach/Lane	Available	No Build 2022	Build 2022	w/ Protected Left-Turn 2022
Eastbound West Commercial Street Left	700'	276'	289'	388'
Eastbound West Commercial Through/Rights	---	234'	365'	407'
Westbound West Commercial Street Left	55'	12'	31'	73'
Westbound West Commercial Through/Rights	---	557'	899'	975'
Southbound Beach Street	350'	30'	35'	20'
Northbound Site Drive	---	59'	207'	160'

PM Peak Hour - 95th Percentile Queues

Approach/Lane	Available	No Build 2022	Build 2022	w/ Protected Left-Turn 2022
Eastbound West Commercial Street Left	700'	779'	749'	847'
Eastbound West Commercial Through/Rights	---	940'	815'	1,958'
Westbound West Commercial Street Left	55'	8'	12'	13'
Westbound West Commercial Through/Rights	---	1,202'	1,239'	1,223'
Southbound Beach Street	350'	277'	334'	291'
Northbound Site Drive	---	119'	217'	218'

As seen above, the 95th percentile Build queue lengths in turn lanes are generally similar to No Build queue lengths, again demonstrating that the proposed cold storage will have limited impact on this signalized intersection. The Commercial Street through queues will increase somewhat, as would be expected, given the drop in LOS and associated increase in delay. Adequate storage is available for all turn lanes considering the Build volumes with the exception of the eastbound left onto Beach Street during the PM peak hour, which based upon the anlaysis, exceeds the storage length by two vehicles. This is an existing deficiency, which is not especially problematic in that it only increases the through queue until the left-turning vehicles can reach the left-turn lane. It is important to note that under Build volumes this queue length actually decreases. Hence, the trips generated by the cold storage facility are not expected to worsen this existing deficiency.

The protected left-turn option would significantly increase the eastbound queue lengths, as would be expected, since the portion of the cycle when left-turn movements can occur will be more limited. The other queue lengths are not significantly affected by this potential change in phasing.

To summarize, the signalized intersection of West Commercial Street, Beach Street and the site drive is expected to operate at LOS "C" overall during the AM peak hour with no capacity concerns. The intersection is expected to operate at LOS "E" overall during the PM peak hour with most approaches near or over capacity. The analysis did not show any significant increase in delays due to the proposed cold storage facility which is expected given the limited volumes generated by the IMT and Cold Storage facility. The provision of protected only left-turn phasing for turns onto Beach Street would worsen LOS and increase delays but it would improve safety. This change in phasing has the potential to eliminate or reduce the six angle collisions that occurred at the intersection during the past three years but will significantly increase delays and also queues for eastbound movements.

PEDESTRIAN AND BICYCLE EVALUATION

The City requested an evaluation of the West Commercial Street, Beach Street and site drive intersection in regard to multi-modal transportation.

There are bike lanes provided (and marked) through the Beach Street intersection on West Commercial Street connecting bicyclists to the Fore River Parkway Trail. The shoulder on West Commercial Street ranges from six to ten feet providing for bicyclists until they reach the Fore River Trail. At the Beach Street intersection there is a blank out "no right turn on red" sign, which activates when bicyclists are approaching Beach Street.

There is a continuous sidewalk on Commercial Street to the east connecting to the Old Port. The sidewalk continues to the west on West Commercial Street for approximately ½ mile where there is a gap until one reaches the Fore River Parkway Trail. MaineDOT has scheduled (funded) a multi-modal trail which will run from Beach Street for 0.57 mile connecting to the Fore River Parkway Trail. With this project there will be continuous sidewalk or trail along West Commercial Street from the Veteran's Memorial Bridge and Fore River Parkway area to the Old Port providing continuous pedestrian facilities. There is also existing sidewalk along Beach Street, connecting to York Street and Clark Street and the West End neighborhood.

There are two crosswalks at the signalized intersection. One crosses the Beach Street approach and one crosses West Commercial Street on the easterly side, connecting to the site. A field review showed that there are pedestrian pushbuttons which activate the pedestrian signals and that they operate acceptably with adequate walk time. It is recommended that the blank out "no right turn" sign onto Beach Street also activate when the pedestrian signal crossing Beach Street is activated to improve pedestrian safety.

The pedestrian phase for the Beach Street crossing is concurrent with West Commercial Street movements. Under current phasing this is more difficult and potentially dangerous for pedestrians to cross given the high volume of permitted left turns onto Beach Street, especially during the PM peak hour with 482 eastbound left turns. If protected only left turn phasing was implemented the pedestrian phase could be concurrent with the Commercial Street through movements improving the safety of this pedestrian crosswalk.

TRAVEL DEMAND MANAGEMENT PLAN

The City has requested that the project consider a Travel Demand Management (TDM) plan. The cold storage facility is expected to have a maximum of 25 employees, which will be split between 3 shifts. There will be 10 employees during the first primary shift, 10 during the second primary shift, and up to 5 during the third (night) shift. The provision of three shifts inherently manages demand and reduces peak hour trips.

As noted in the preceding pedestrian and bicycle evaluation, there will be continuous sidewalk or multi-use trail, which will allow nearby employees to walk to work or employees to walk to lunch, etc. There will be a bike rack and showers at the cold storage facility so that employees could bike longer distances to work. Additionally, the site is approximately 1,300 feet from a Portland Metro Route 8 – Peninsula Loop bus stop, providing a transit alternative. It is expected that there will be limited opportunities for ride sharing (given the limited number of employees per shift) but it is recommended that a rideshare board be placed in the employee break room to encourage employees to seek ride sharing opportunities.

SUMMARY AND RECOMMENDATIONS

The Maine International Cold Storage Facility is expected to generate 39 one-way trips during the AM peak hour and 22 during the PM peak hour.

The signalized intersection of West Commercial Street, Beach Street and the site drive is expected to operate at LOS "C" under Build volumes overall during the AM peak hour with no capacity concerns. It is important to note that the AM peak hour is when the cold storage facility is expected to be busiest (versus the PM peak hour).

The intersection is expected to operate at LOS "E" overall during the PM peak hour with most approaches near or over capacity. This same LOS "E" is projected under No Build volumes. The analysis did not show any significant increase in delays due to the proposed cold storage facility which would be expected given the limited volumes generated by the Cold Storage facility.

Given that this intersection has been built to its maximum desirable lanes, and given the multi-modal components, there is little that can be done to improve operations and lessen the PM peak hour delays. Modification of the signal to adaptive control is recommended given the existing capacity constraint and large directional shifts between the AM and PM peak hours. Additionally, it is expected that weekend patterns and Old Port and Portland events add to the variation in daily and hourly traffic flows, favoring adaptive control.

Build queue lengths in the turn lanes are generally similar to No Build queue lengths, again demonstrating that the proposed cold storage will have limited impact on the signalized intersection. The Commercial Street through queues will increase somewhat, as would be expected, given the drop in LOS and associated increase in delay. Adequate storage is available for the turn lanes for Build volumes with the exception of the eastbound left onto Beach Street during the PM peak hour, which based upon the anlaysis, exceeds the storage length by two vehicles. This is an existing deficiency and under Build volumes this queue length actually decreases.

In terms of safety, there is one high crash location within the study area; the intersection of West Commercial Street, Beach Street and the site drive. Analysis of the collision diagram for the most recent three-year period shows a continued pattern of rear ends for through vehicles on West Commercial Street as well as minor pattern of angle collisions involving left-turns onto Beach Street. The VA Clinic will be enhancing signage on West Commercial to reduce the potential for the rear-end collisions on Commercial Street. The Bray VA Clinic study suggested that protected only left-turn phasing for eastbound traffic (versus the current permitted/protected) would reduce the angle collisions occurring between left turns onto Beach Street and westbound Commercial Street traffic. This option of protected only left-turn phasing for turns onto Beach Street would worsen LOS and increase delays but it would improve safety. This change in phasing has the potential to eliminate or reduce the six angle

collisions that occurred at the intersection during the past three years but it will significantly increase delays and also queues for eastbound movements. A change to protected left-turn only phasing would also improve the safety of the Beach Street crosswalk since the pedestrian phase could be concurrent with the Commercial Street through movements eliminating conflicts between permitted left turns and pedestrians.

In terms of a TDM, the 25 employees will be spread over three shifts thus reducing peak hour trips. The site is directly served by both pedestrian and bicycle facilities. Additionally, there is a transit stop within a reasonable distance of the facility. The facility will provide a bike rack and showers to encourage employees to bike to work. It is recommended that a ride share board be located in the employee break room although given the small number of employees per shift rideshare opportunities are expected to be limited.



Figure 1

Site Location Map

Maine International Cold Storage Facility

Portland, Maine

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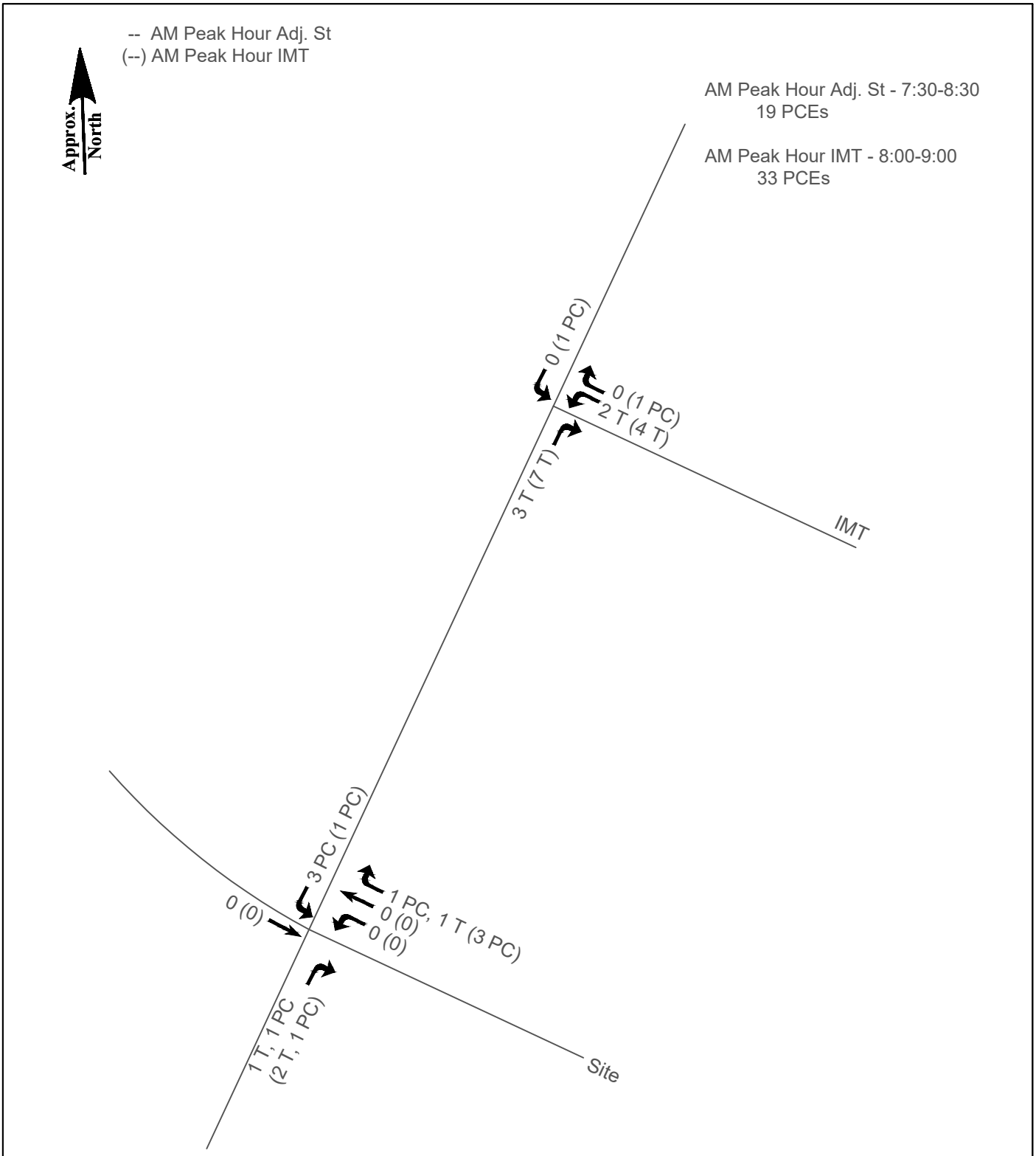


Figure 2

Existing AM IMT Trips
Maine International Cold Storage Facility
Portland, Maine

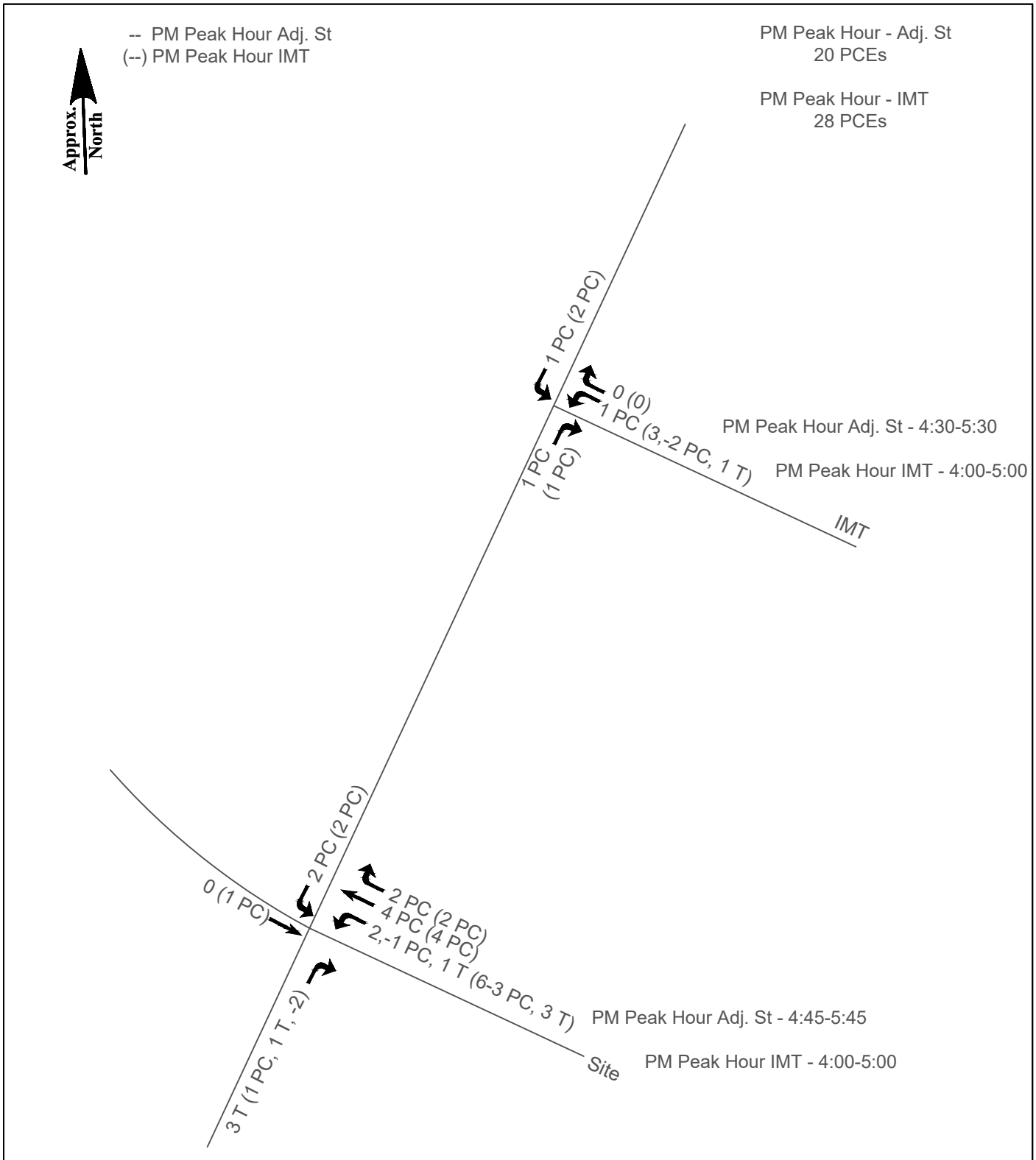


Figure 3

Existing PM IMT Trips
Maine International Cold Storage Facility
Portland, Maine

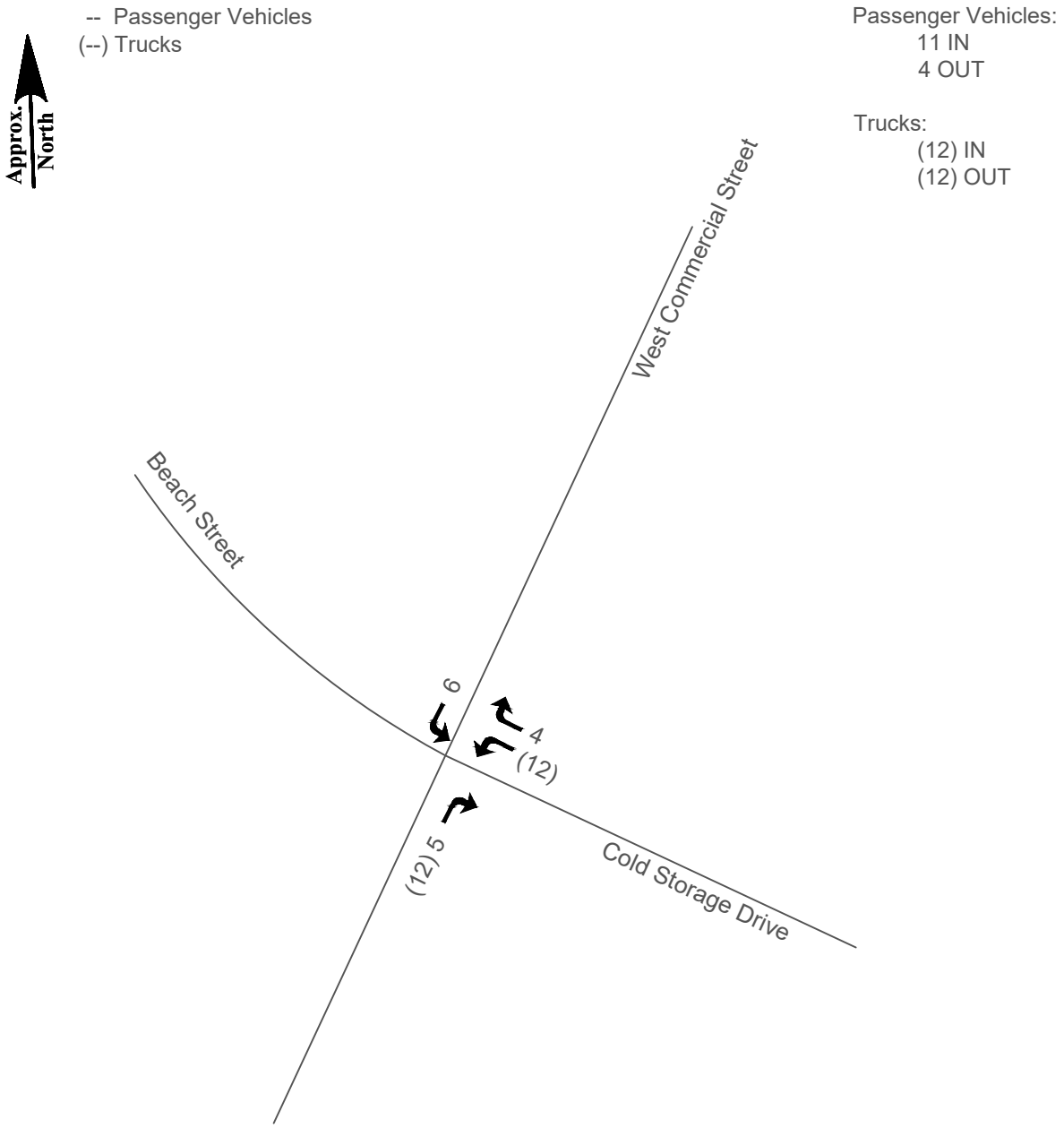


Figure 4

AM Peak Hour Trip Assignments
Maine International Cold Storage Facility
Portland, Maine

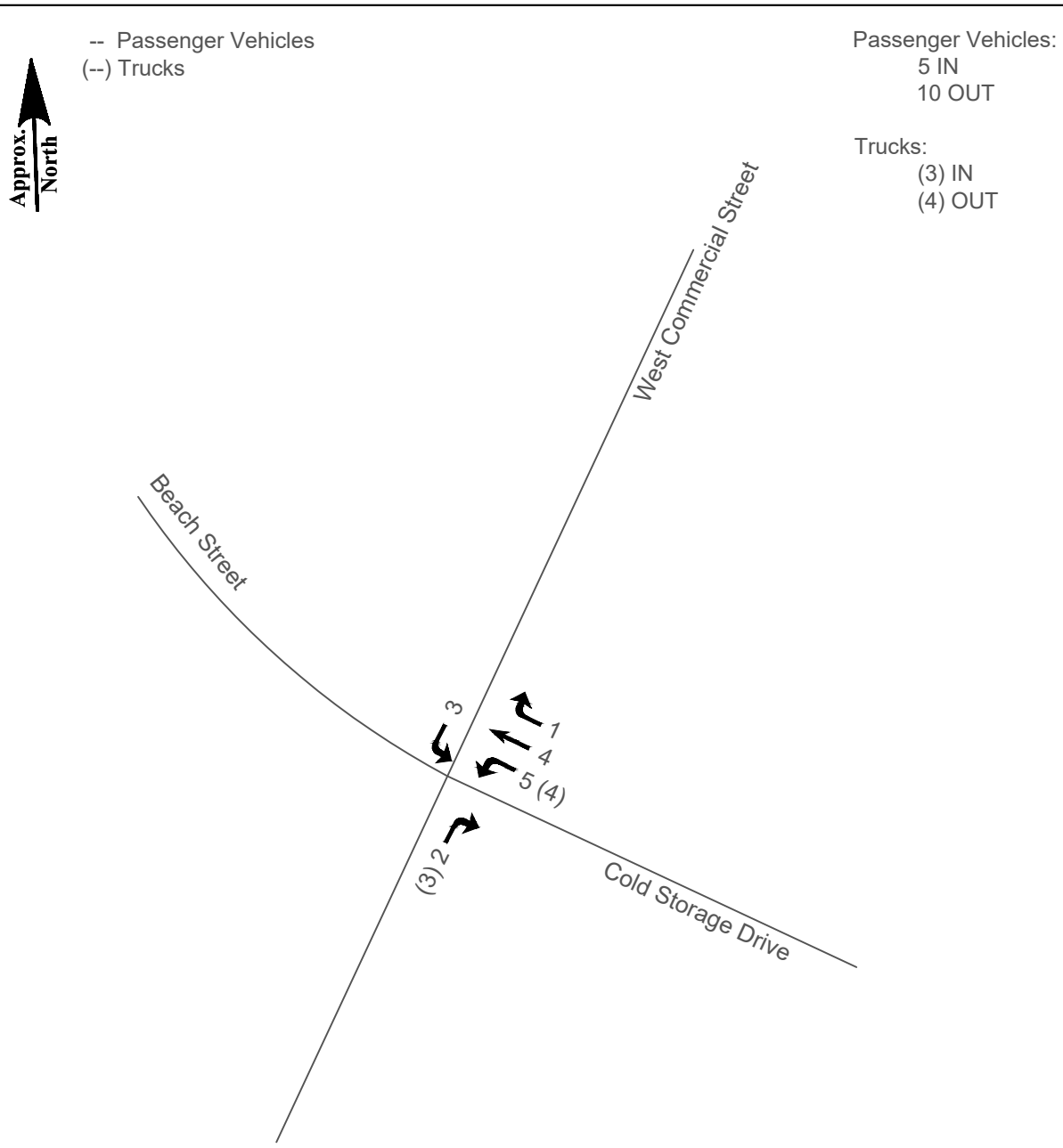


Figure 5

PM Peak Hour Trip Assignments
Maine International Cold Storage Facility
Portland, Maine

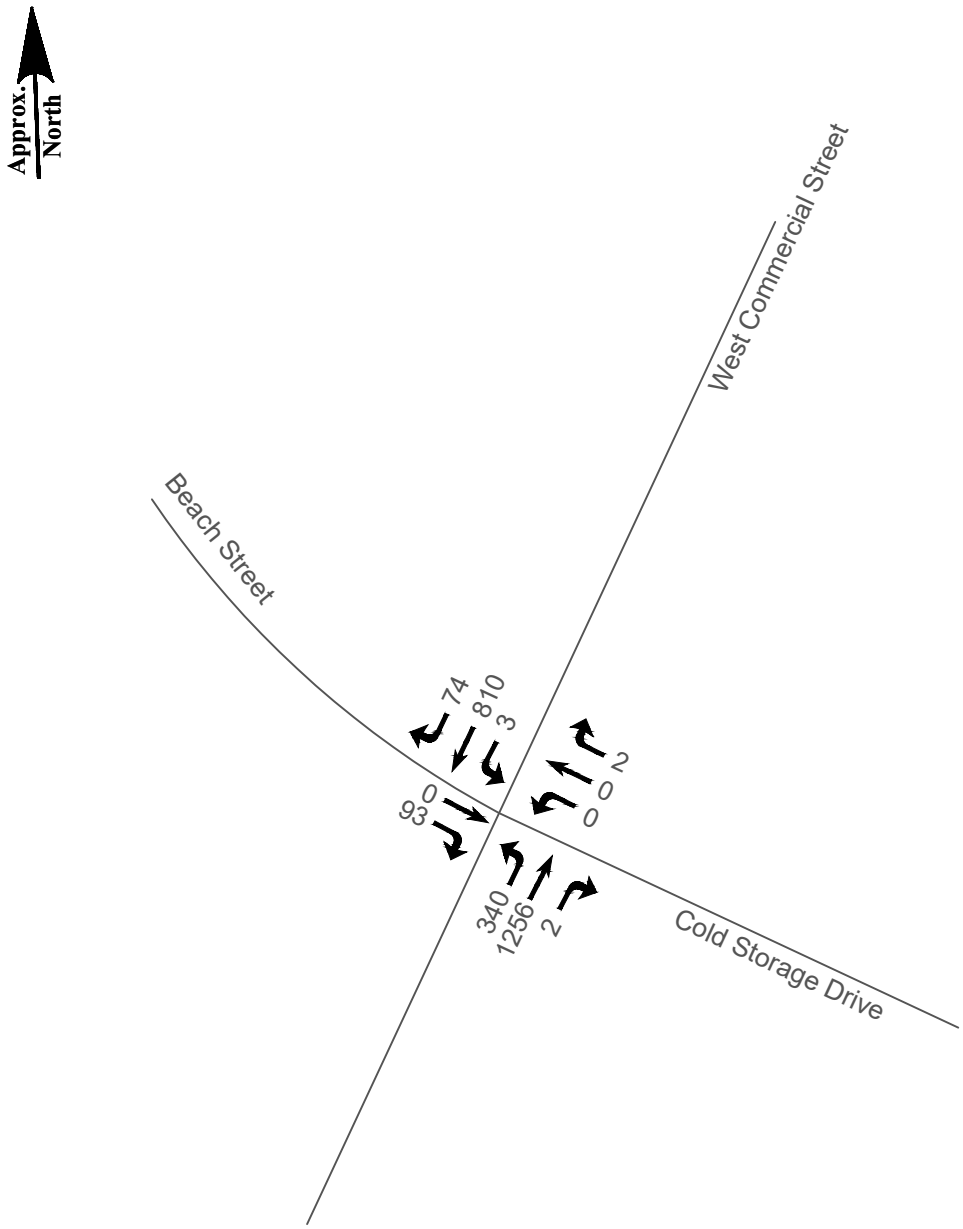


Figure 6

2022 No-Build AM Peak Hour Volumes
Maine International Cold Storage Facility
Portland, Maine

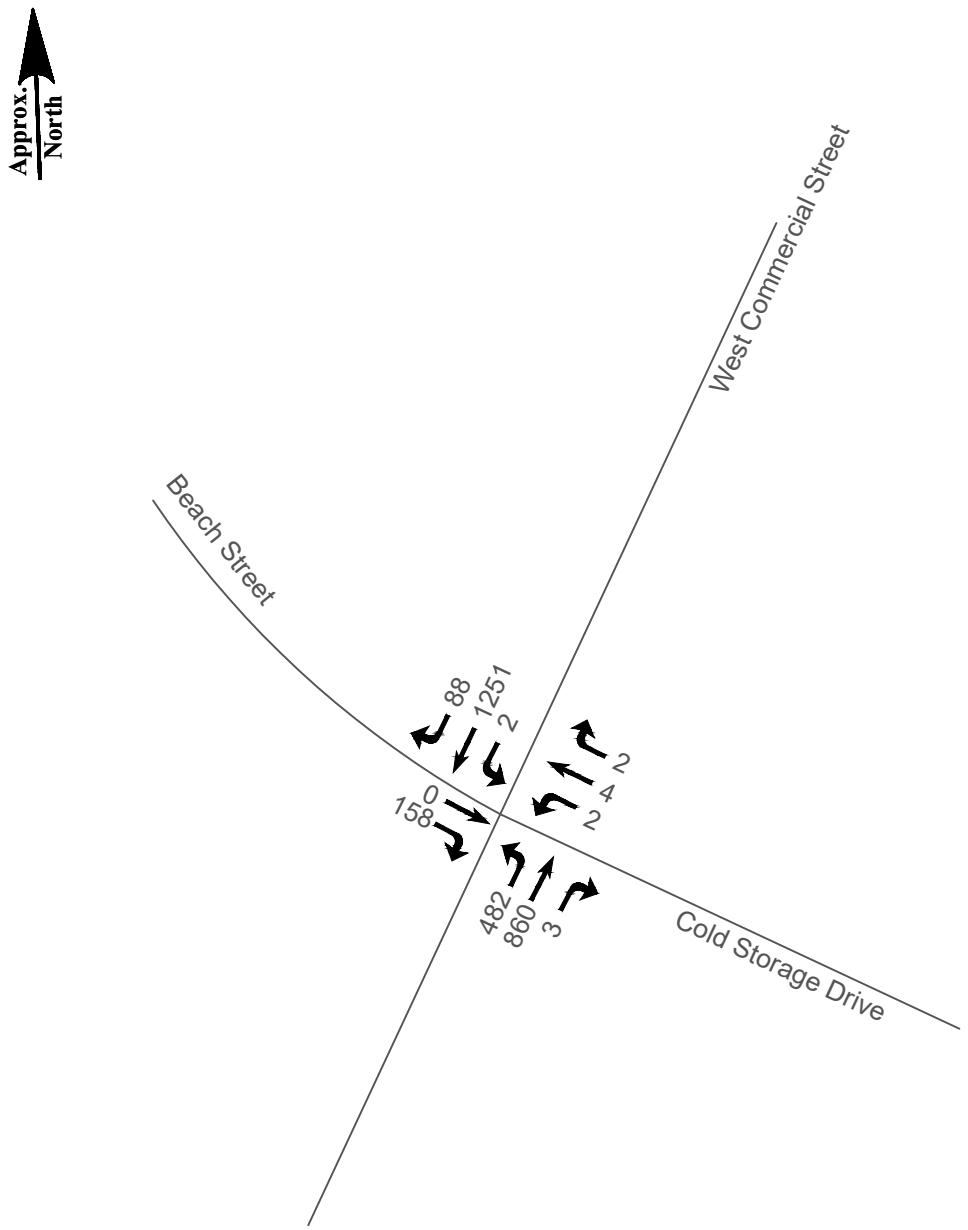


Figure 7

2022 No-Build PM Peak Hour Volumes
Maine International Cold Storage Facility
Portland, Maine

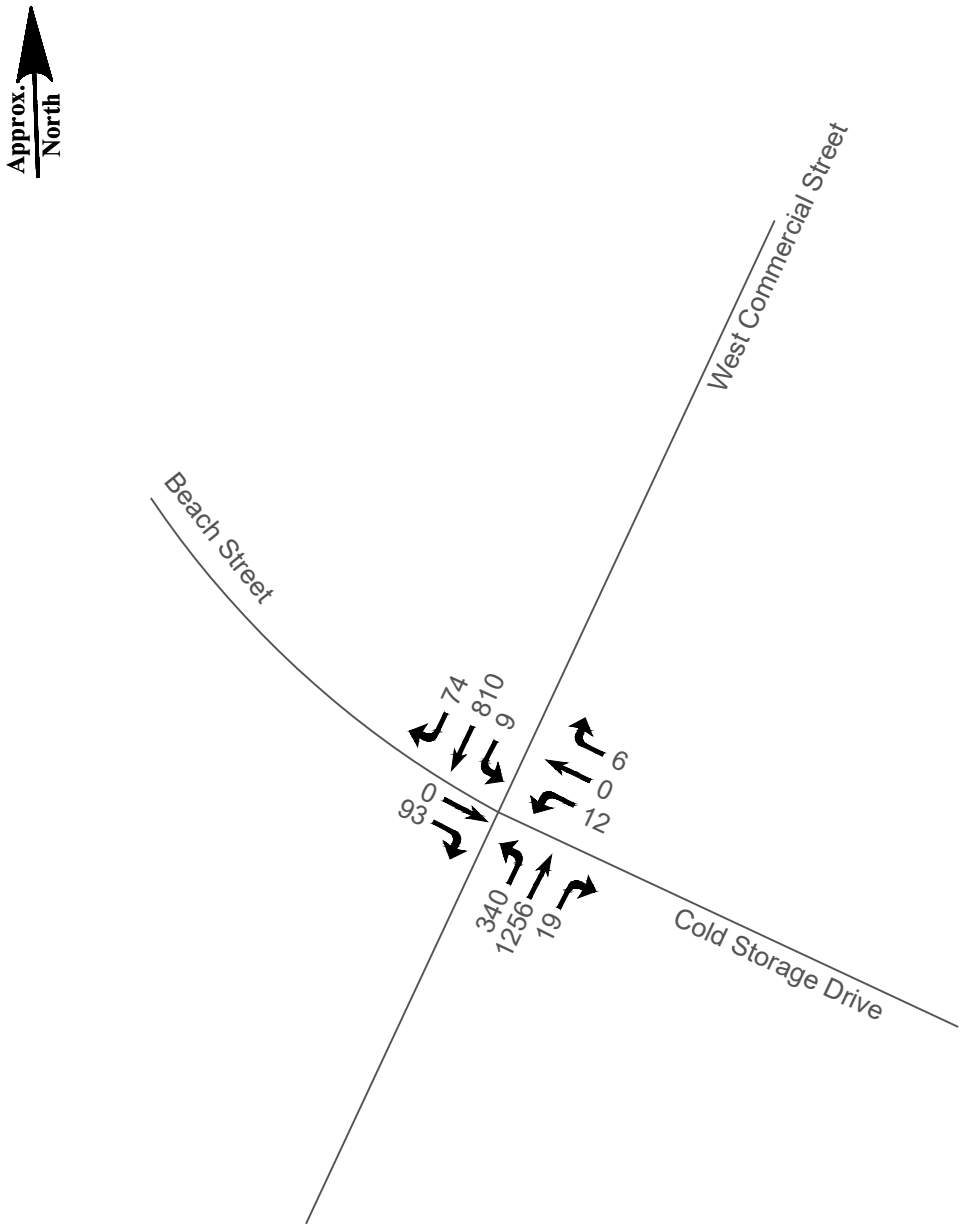


Figure 8

2022 Build AM Peak Hour Volumes
Maine International Cold Storage Facility
Portland, Maine

Sewall
The evolution of expertise
A TFK company

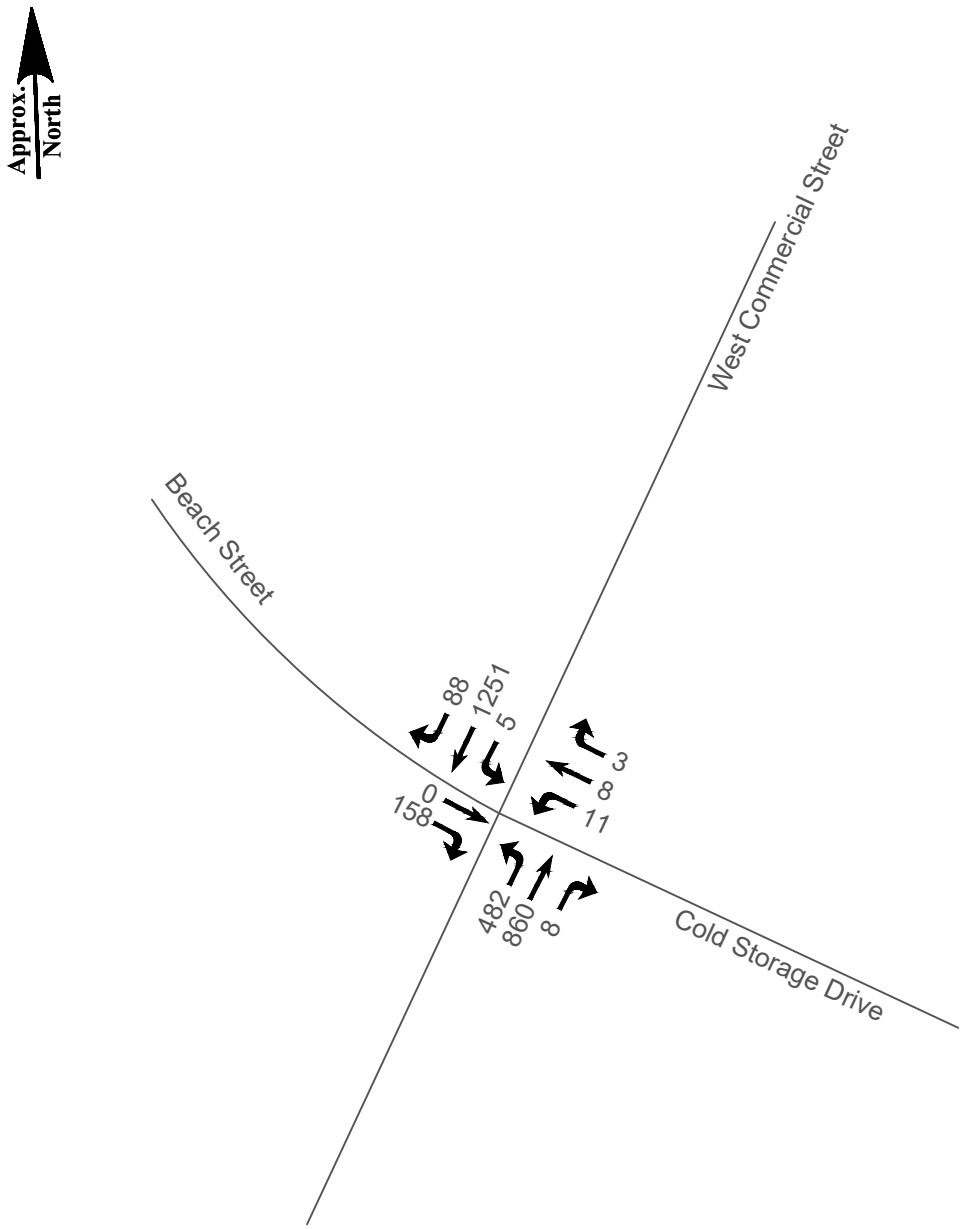


Figure 9

2022 Build PM Peak Hour Volumes
Maine International Cold Storage Facility
Portland, Maine

APPENDIX

Turning Movement Counts

Accident Data

Collision Diagram

Capacity Analysis

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 1

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commerical St From North				Eimskip From East				W Commerical St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	12	129	0	141	0	0	0	0	0	166	40	206	19	0	0	19	366
07:15 AM	14	142	0	156	1	0	0	1	3	189	66	258	26	0	0	26	441
07:30 AM	17	182	0	199	0	0	0	0	0	230	86	316	21	0	0	21	536
07:45 AM	16	168	2	186	0	0	0	0	1	259	81	341	22	0	0	22	549
Total	59	621	2	682	1	0	0	1	4	844	273	1121	88	0	0	88	1892
08:00 AM	15	154	0	169	2	0	0	2	1	240	85	326	28	0	0	28	525
08:15 AM	14	138	1	153	0	0	0	0	0	268	81	349	18	0	0	18	520
08:30 AM	6	141	0	147	0	0	0	0	0	216	71	287	27	0	0	27	461
08:45 AM	16	114	0	130	1	0	0	1	1	192	86	279	26	0	0	26	436
Total	51	547	1	599	3	0	0	3	2	916	323	1241	99	0	0	99	1942

*** BREAK ***

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 2

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

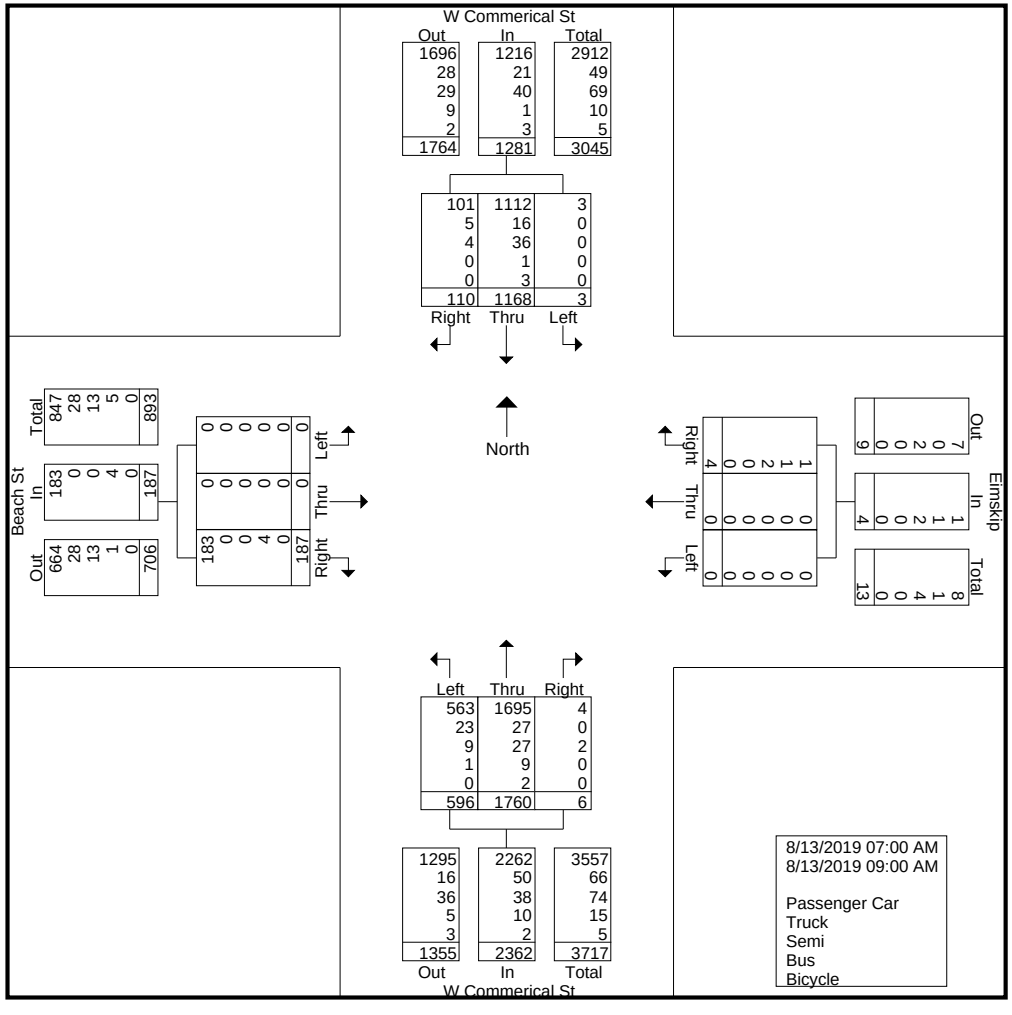
	W Commerical St From North				Eimskip From East				W Commerical St From South				Beach St From West				
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Grand Total	110	1168	3	1281	4	0	0	4	6	1760	596	2362	187	0	0	187	3834
Apprch %	8.6	91.2	0.2		100	0	0		0.3	74.5	25.2		100	0	0		
Total %	2.9	30.5	0.1	33.4	0.1	0	0	0.1	0.2	45.9	15.5	61.6	4.9	0	0	4.9	
Passenger Car	101	1112	3	1216	1	0	0	1	4	1695	563	2262	183	0	0	183	3662
% Passenger Car	91.8	95.2	100	94.9	25	0	0	25	66.7	96.3	94.5	95.8	97.9	0	0	97.9	95.5
Truck	5	16	0	21	1	0	0	1	0	27	23	50	0	0	0	0	72
% Truck	4.5	1.4	0	1.6	25	0	0	25	0	1.5	3.9	2.1	0	0	0	0	1.9
Semi	4	36	0	40	2	0	0	2	2	27	9	38	0	0	0	0	80
% Semi	3.6	3.1	0	3.1	50	0	0	50	33.3	1.5	1.5	1.6	0	0	0	0	2.1
Bus	0	1	0	1	0	0	0	0	0	9	1	10	4	0	0	4	15
% Bus	0	0.1	0	0.1	0	0	0	0	0	0.5	0.2	0.4	2.1	0	0	2.1	0.4
Bicycle	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0	5
% Bicycle	0	0.3	0	0.2	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 3



Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 5

	W Commerical St From North				Eimskip From East				W Commerical St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**17**	**182**	0	**199**	0	0	0	0	0	230	**86**	316	21	0	0	21	536
07:45 AM	16	168	**2**	186	0	0	0	0	**1**	259	81	341	22	0	0	22	**549**
08:00 AM	15	154	0	169	**2**	0	0	**2**	1	240	85	326	**28**	0	0	**28**	525
08:15 AM	14	138	1	153	0	0	0	0	0	**268**	81	**349**	18	0	0	18	520
Total Volume	62	642	3	707	2	0	0	2	2	997	333	1332	89	0	0	89	2130
% App. Total	8.8	90.8	0.4		100	0	0		0.2	74.8	25		100	0	0		
PHF	.912	.882	.375	.888	.250	.000	.000	.250	.500	.930	.968	.954	.795	.000	.000	.795	.970

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 PM
Thunder Showers
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 PM
Site Code : 00813192
Start Date : 8/13/2019
Page No : 1

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commercial St From North				Eimskip From East				W Commercial St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
03:00 PM	21	203	0	224	0	1	1	2	0	102	87	189	30	1	0	31	446
03:15 PM	23	208	2	233	2	1	4	7	1	106	92	199	15	0	0	15	454
03:30 PM	20	227	0	247	0	0	2	2	0	120	84	204	25	0	0	25	478
03:45 PM	16	177	1	194	1	1	2	4	3	136	66	205	21	0	1	22	425
Total	80	815	3	898	3	3	9	15	4	464	329	797	91	1	1	93	1803
04:00 PM	24	194	1	219	2	1	5	8	0	102	104	206	36	1	0	37	470
04:15 PM	13	217	0	230	0	0	0	0	0	117	117	234	37	0	0	37	501
04:30 PM	13	226	0	239	0	2	0	2	1	118	110	229	24	0	0	24	494
04:45 PM	19	239	1	259	0	1	1	2	1	156	95	252	28	0	0	28	541
Total	69	876	2	947	2	4	6	12	2	493	426	921	125	1	0	126	2006
05:00 PM	17	222	1	240	1	1	0	2	1	144	140	285	36	0	0	36	563
05:15 PM	19	241	0	260	1	2	0	3	1	175	88	264	39	0	0	39	566
05:30 PM	10	211	0	221	0	0	1	1	0	142	98	240	46	0	0	46	508
05:45 PM	25	232	0	257	0	0	0	0	0	124	85	209	14	0	1	15	481
Total	71	906	1	978	2	3	1	6	2	585	411	998	135	0	1	136	2118

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 PM
Thunder Showers
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 PM
Site Code : 00813192
Start Date : 8/13/2019
Page No : 2

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commercial St From North				Eimskip From East				W Commercial St From South				Beach St From West				
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Grand Total	220	2597	6	2823	7	10	16	33	8	1542	1166	2716	351	2	2	355	5927
Apprch %	7.8	92	0.2		21.2	30.3	48.5		0.3	56.8	42.9		98.9	0.6	0.6		
Total %	3.7	43.8	0.1	47.6	0.1	0.2	0.3	0.6	0.1	26	19.7	45.8	5.9	0	0	6	
Passenger Car	216	2542	5	2763	7	10	7	24	7	1504	1150	2661	342	2	2	346	5794
% Passenger Car	98.2	97.9	83.3	97.9	100	100	43.8	72.7	87.5	97.5	98.6	98	97.4	100	100	97.5	97.8
Truck	1	27	0	28	0	0	0	0	0	15	7	22	3	0	0	3	53
% Truck	0.5	1	0	1	0	0	0	0	0	1	0.6	0.8	0.9	0	0	0.8	0.9
Semi	1	14	1	16	0	0	9	9	1	12	9	22	0	0	0	0	47
% Semi	0.5	0.5	16.7	0.6	0	0	56.2	27.3	12.5	0.8	0.8	0.8	0	0	0	0	0.8
Bus	1	7	0	8	0	0	0	0	0	5	0	5	6	0	0	6	19
% Bus	0.5	0.3	0	0.3	0	0	0	0	0	0.3	0	0.2	1.7	0	0	1.7	0.3
Bicycle	1	7	0	8	0	0	0	0	0	6	0	6	0	0	0	0	14
% Bicycle	0.5	0.3	0	0.3	0	0	0	0	0	0.4	0	0.2	0	0	0	0	0.2

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 PM
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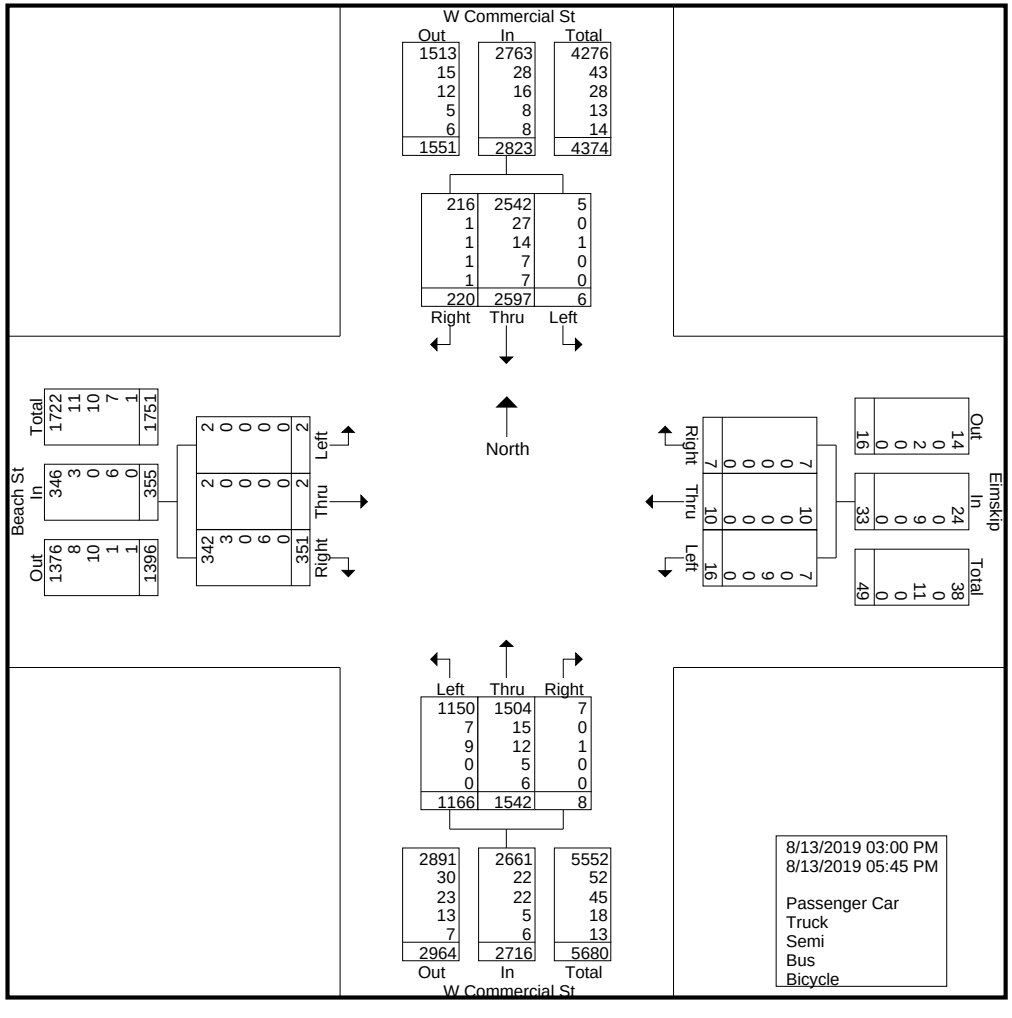

Traffic Solutions

17 Mountview Drive
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Portland W Commerical & Beach St
August 13, 2019 PM
Thunder Showers
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File Name : Portland W Commercial St & Beach St 8-14-19 PM
Site Code : 00813192
Start Date : 8/13/2019
Page No : 5

	W Commercial St From North				Eimskip From East				W Commercial St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**19**	239	**1**	259	0	1	**1**	2	**1**	156	95	252	28	0	0	28	541
05:00 PM	17	222	1	240	**1**	1	0	2	1	144	**140**	**285**	36	0	0	36	563
05:15 PM	19	**241**	0	**260**	1	**2**	0	**3**	1	**175**	88	264	39	0	0	39	**566**
05:30 PM	10	211	0	221	0	0	1	1	0	142	98	240	**46**	0	0	**46**	508
Total Volume	65	913	2	980	2	4	2	8	3	617	421	1041	149	0	0	149	2178
% App. Total	6.6	93.2	0.2		25	50	25		0.3	59.3	40.4		100	0	0		
PHF	.855	.947	.500	.942	.500	.500	.500	.667	.750	.881	.752	.913	.810	.000	.000	.810	.962

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Portland: W Commercial St/Commercial St/Rte 1A from Veterans Memorial Bridge (node 66542) to High St (node 16784); Beach St from Commercial St (node 16780) to York St (node 19129); Beach St Ramp to Casco Bay Bridge (nodes 16780-10549)

REPORT PARAMETERS

Year 2017, Start Month 1 through Year 2019 End Month: 12

Route: 0001A	Start Node: 66542	Start Offset: 0	☐ Exclude First Node
	End Node: 16784	End Offset: 0	☐ Exclude Last Node
Route: 001AS	Start Node: 16779	Start Offset: 0	☑ Exclude First Node
	End Node: 60469	End Offset: 0	☑ Exclude Last Node
Route: 001AS	Start Node: 60469	Start Offset: 0	☑ Exclude First Node
	End Node: 16747	End Offset: 0	☑ Exclude Last Node
Route: 001AS	Start Node: 16747	Start Offset: 0	☑ Exclude First Node
	End Node: 66542	End Offset: 0	☑ Exclude Last Node
Route: 0560041	Start Node: 16780	Start Offset: 0	☑ Exclude First Node
	End Node: 19129	End Offset: 0	☐ Exclude Last Node
Route: 05A0077	Start Node: 16780	Start Offset: 0	☑ Exclude First Node
	End Node: 10549	End Offset: 0	☐ Exclude Last Node

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
66542	0001A - 9.70	Int of FORE RIVER PKY VETERANS BRIDGE	9	10	0	0	0	2	8	20.0	9.969	0.33	1.14	0.00
												Statewide Crash Rate:	0.75	
16747	0001A - 9.86	Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST	9	29	0	1	2	5	21	27.6	10.636	0.91	1.13	0.00
												Statewide Crash Rate:	0.75	
66547	0001A - 9.91	Int of CASSIDY POINT DR W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	4.216	0.00	0.41	0.00
												Statewide Crash Rate:	0.16	
60470	0001A - 9.95	Int of CASSIDY POINT DR W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	4.169	0.00	0.41	0.00
												Statewide Crash Rate:	0.16	
60469	0001A - 10.04	Int of CASSIDY POINT DR W COMMERCIAL ST	9	4	0	0	0	2	2	50.0	8.163	0.16	1.18	0.00
												Statewide Crash Rate:	0.75	
16779	0001A - 10.10	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	7.948	0.00	0.35	0.00
												Statewide Crash Rate:	0.16	
73433	0001A - 10.12	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.951	0.00	0.42	0.00
												Statewide Crash Rate:	0.16	
73122	0001A - 10.40	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.951	0.00	0.42	0.00
												Statewide Crash Rate:	0.16	
16780	0001A - 10.69	Int of BEACH ST ENT TO PORTLAND YACHT RAMP BEACI	9	28	0	0	2	9	17	39.3	7.648	1.22	1.19	1.02
												Statewide Crash Rate:	0.75	
16781	0001A - 10.79	Int of COMMERCIAL ST W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.290	0.00	0.44	0.00
												Statewide Crash Rate:	0.16	
16782	0001A - 10.96	RRX 837536 COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.290	0.00	0.44	0.00
												Statewide Crash Rate:	0.16	
16783	0001A - 11.05	Int of COMMERCIAL ST PARK ST	2	17	0	0	1	4	12	29.4	7.962	0.71	0.35	2.03
												Statewide Crash Rate:	0.16	
16784	0001A - 11.13	Int of COMMERCIAL ST HIGH ST	2	4	0	2	0	1	1	75.0	5.860	0.23	0.38	0.00
												Statewide Crash Rate:	0.16	
66548	001AS - 2.61	Int of FORE RIVER PKY RD INV 3209586	2	0	0	0	0	0	0	0.0	5.475	0.00	0.38	0.00
												Statewide Crash Rate:	0.16	
19129	0560041 - 0.08	Int of BEACH ST CLARK ST YORK ST	2	0	0	0	0	0	0	0.0	0.243	0.00	0.68	0.00
												Statewide Crash Rate:	0.16	
10549	05A0077 - 0.22	Int of RAMP BEACH ST ROUTE 77 SB	2	1	0	0	0	1	0	100.0	6.199	0.05	0.37	0.00
												Statewide Crash Rate:	0.16	
Study Years:	3.00	NODE TOTALS:		93	0	3	5	24	61	34.4	92.970	0.33	0.49	0.69

Crash Summary I

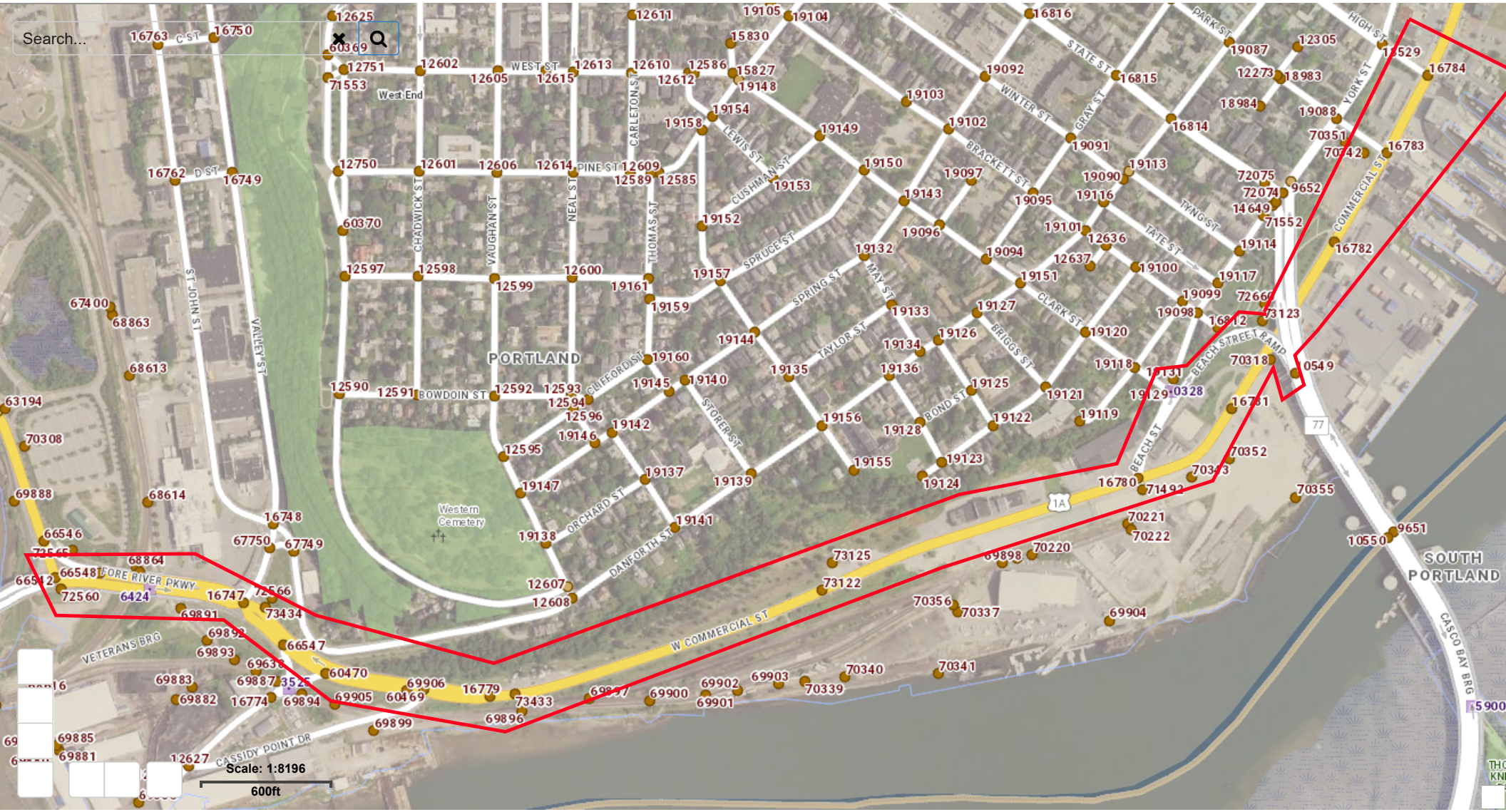
Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
66542	16747	3140171	0 - 0.16	0001A - 9.70	0.16	2	2	0	0	0	1	1	50.0	0.00801	83.26	446.88	0.00
Int of FORE RIVER PKY VETERANS BRIDGE				US 1A											Statewide Crash Rate: 220.75		
16747	66547	3117392	0 - 0.05	0001A - 9.86	0.05	2	1	0	0	0	0	1	0.0	0.00211	158.12	622.96	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
66547	60470	3510989	0 - 0.04	0001A - 9.91	0.04	2	0	0	0	0	0	0	0.0	0.00166	0.00	662.73	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
60470	60469	3510990	0 - 0.09	0001A - 9.95	0.09	2	1	0	0	0	0	1	0.0	0.00375	88.84	537.07	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
60469	16779	3121916	0 - 0.06	0001A - 10.04	0.06	2	0	0	0	0	0	0	0.0	0.00240	0.00	602.49	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
16779	73433	4628058	0 - 0.02	0001A - 10.10	0.02	2	2	0	0	0	0	2	0.0	0.00158	421.82	671.13	0.00
Non Int W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
73433	73122	4628059	0 - 0.28	0001A - 10.12	0.28	2	2	0	0	1	0	1	50.0	0.02213	30.13	361.77	0.00
Non Int W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
73122	16780	4364862	0 - 0.29	0001A - 10.40	0.29	2	11	0	0	1	0	10	9.1	0.02292	160.00	359.45	0.00
Non Int W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
16780	16781	3121544	0 - 0.10	0001A - 10.69	0.10	2	4	0	0	0	2	2	50.0	0.00658	202.63	467.83	0.00
Int of BEACH ST ENT TO PORTLAND YACHT RAMP BEACH ST W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
16781	16782	3119915	0 - 0.17	0001A - 10.79	0.17	2	20	0	0	4	5	11	45.0	0.01119	595.96	414.78	1.44
Int of COMMERCIAL ST W COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
16782	16783	3121545	0 - 0.09	0001A - 10.96	0.09	2	17	0	0	1	4	12	29.4	0.00592	956.85	479.75	1.99
RRX 837536 COMMERCIAL ST				US 1A											Statewide Crash Rate: 220.75		
16783	16784	3116401	0 - 0.08	0001A - 11.05	0.08	2	8	0	0	1	0	7	12.5	0.00410	650.36	525.19	1.24
Int of COMMERCIAL ST PARK ST				US 1A											Statewide Crash Rate: 220.75		
16779	60469	3121919	0 - 0.06	001AS - 2.24	0.06	2	0	0	0	0	0	0	0.0	0.00234	0.00	606.11	0.00
Non Int W COMMERCIAL ST				US 1AS											Statewide Crash Rate: 220.75		
60469	16747	4628063	0 - 0.18	001AS - 2.30	0.18	2	1	0	0	0	0	1	0.0	0.00765	43.58	451.62	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST				US 1AS											Statewide Crash Rate: 220.75		
16747	66548	3117394	0 - 0.13	001AS - 2.48	0.13	2	4	0	0	0	0	4	0.0	0.00712	187.33	459.26	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST				US 1AS											Statewide Crash Rate: 220.75		
66548	66542	3121654	0 - 0.04	001AS - 2.61	0.04	2	0	0	0	0	0	0	0.0	0.00195	0.00	635.68	0.00
Int of FORE RIVER PKY RD INV 3209586				US 1AS											Statewide Crash Rate: 220.75		
16780	19129	192452	0 - 0.08	0560041 - 0	0.08	2	0	0	0	0	0	0	0.0	0.00032	0.00	1590.52	0.00
Int of BEACH ST ENT TO PORTLAND YACHT RAMP BEACH ST W COMMERCIAL ST				RD INV 05 60041											Statewide Crash Rate: 417.26		
10549	16780	3105184	0 - 0.22	05A0077 - 0	0.22	2	1	0	0	0	0	1	0.0	0.00463	72.07	509.63	0.00
Int of RAMP BEACH ST ROUTE 77 SB				RD INV 05 A0077											Statewide Crash Rate: 220.75		
Study Years: 3.00				Section Totals:	2.14		74	0	0	8	12	54	27.0	0.11635	212.01	284.73	0.74

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
Grand Totals:					2.14		167	0	3	13	36	115	31.1	0.11635	478.46	407.06	1.18


Search...
PORTLAND
SOUTH PORTLAND
West End
Western Cemetery
WEST ST
CARLETON ST
PINE ST
CHADWICK ST
VAUGHAN ST
NEAL ST
THOMAS ST
CUSHMAN ST
LEWIS ST
SPRUCE ST
SPRING ST
MAY ST
TAYLOR ST
CLIFFORD ST
BOWDOIN ST
STORER ST
ORCHARD ST
DANFORTH ST
BRACKETT ST
WINTER ST
GRAY ST
STATE ST
PARK ST
HIGH ST
YORK ST
COMMERCIAL ST
TYNG ST
TATE ST
CLARK ST
BRIGGS ST
BOND ST
BEACH ST
BEACH STREET RAMP
W COMMERCIAL ST
CASCO BAY BRG
VETERANS BRG
CASSIDY POINT DR
ST JOHN ST
VALLEY ST
FORE RIVER PKWY
C ST
D ST
1A
77
Scale: 1:8196
600ft

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **CUMBERLAND** TOWN: **PORTLAND**

LOW NODE: **16780** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

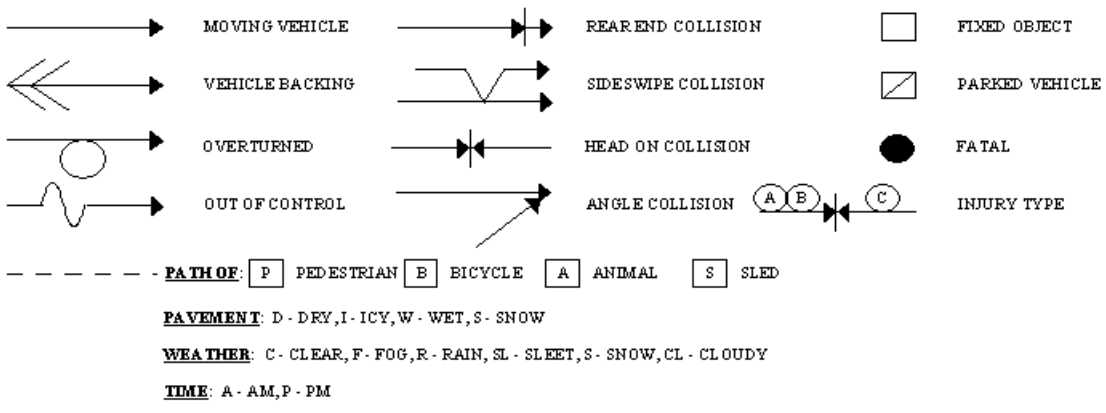
DESCRIPTION: **Jct of West Commercial St & Beach St**

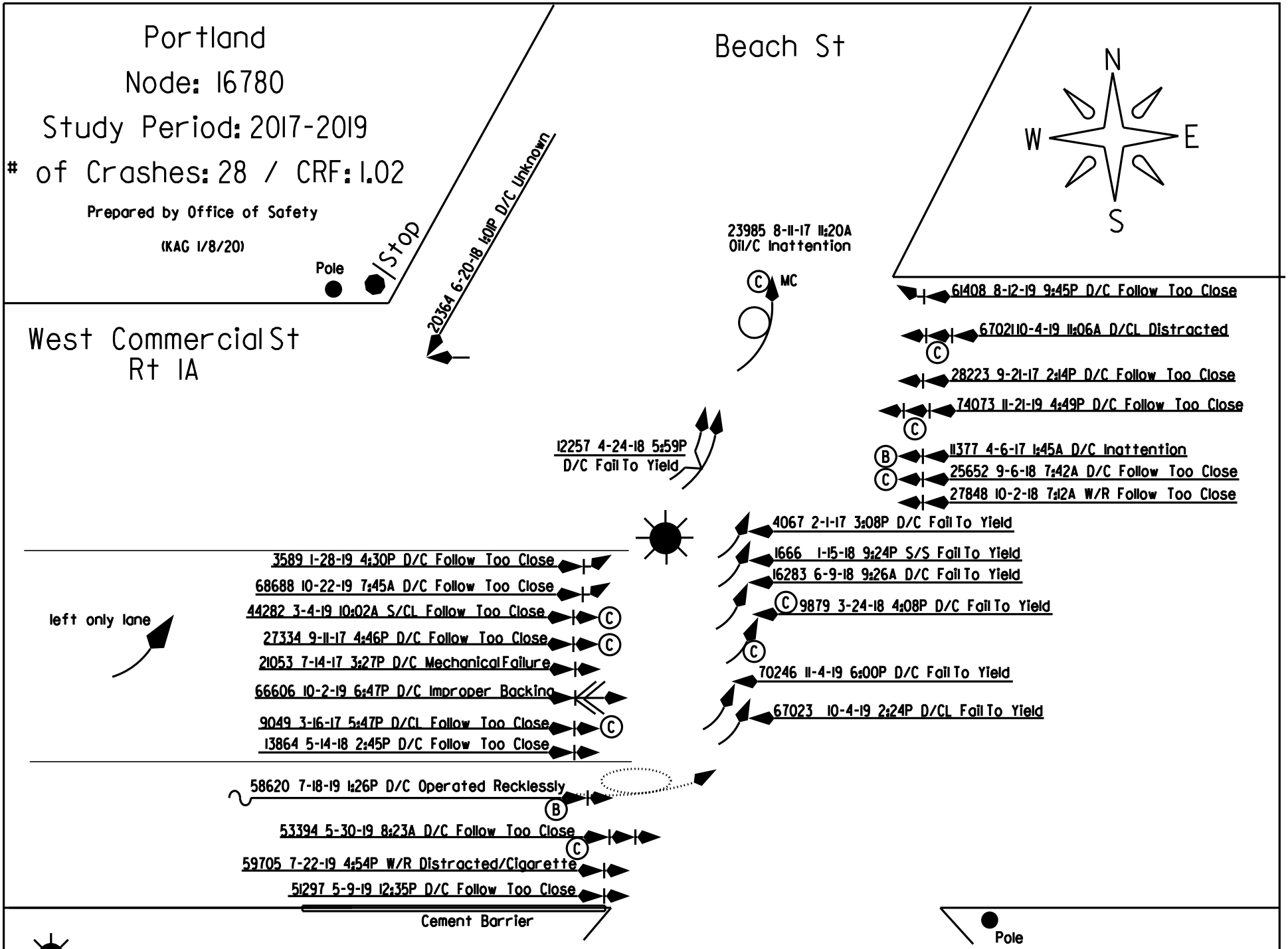
RTE # / RD #: **0001A** DATE DRAWN: **5/15/2020** DRAWN BY: **Katherine**

STUDY FROM: **1/1/2017** STUDY TO: **12/31/2019**

CRASH RATE: **1.22** CRF: **1.02** % INJURY: **39.3** TOTAL CRASHES: **28**

LEGEND




Portland
Node: 16780
Study Period: 2017-2019
# of Crashes: 28 / CRF: 1.02
Prepared by Office of Safety
(KAG 1/8/20)
Pole
Stop
20364 6-20-18 4:01P D/C Unknown
Beach St
N
W
E
S
23985 8-11-17 11:20A
Oil/C Inattention
C
MC
61408 8-12-19 9:45P D/C Follow Too Close
6702110-4-19 11:06A D/CL Distracted
C
28223 9-21-17 2:14P D/C Follow Too Close
74073 11-21-19 4:49P D/C Follow Too Close
C
12257 4-24-18 5:59P
D/C Fail To Yield
B
11377 4-6-17 1:45A D/C Inattention
C
25652 9-6-18 7:42A D/C Follow Too Close
27848 10-2-18 7:12A W/R Follow Too Close
4067 2-1-17 3:08P D/C Fail To Yield
1666 1-15-18 9:24P S/S Fail To Yield
16283 6-9-18 9:26A D/C Fail To Yield
C
9879 3-24-18 4:08P D/C Fail To Yield
C
70246 11-4-19 6:00P D/C Fail To Yield
67023 10-4-19 2:24P D/CL Fail To Yield
West Commercial St
Rt 1A
3589 1-28-19 4:30P D/C Follow Too Close
68688 10-22-19 7:45A D/C Follow Too Close
44282 3-4-19 10:02A S/CL Follow Too Close
C
27334 9-11-17 4:46P D/C Follow Too Close
C
21053 7-14-17 3:27P D/C Mechanical Failure
66606 10-2-19 6:47P D/C Improper Backing
9049 3-16-17 5:47P D/CL Follow Too Close
C
13864 5-14-18 2:45P D/C Follow Too Close
left only lane
58620 7-18-19 1:26P D/C Operated Recklessly
B
53394 5-30-19 8:23A D/C Follow Too Close
C
59705 7-22-19 4:54P W/R Distracted/Cigarette
51297 5-9-19 12:35P D/C Follow Too Close
Cement Barrier
Pole
= Traffic Signal
Portland Yacht Services Inc

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	665	679	653	660	656	662
Vehs Exited	644	674	633	658	628	647
Starting Vehs	58	68	67	70	67	66
Ending Vehs	79	73	87	72	95	82
Travel Distance (mi)	431	449	419	441	426	433
Travel Time (hr)	19.8	22.3	19.2	19.9	19.7	20.2
Total Delay (hr)	5.2	7.0	4.9	4.9	5.2	5.4
Total Stops	247	250	218	223	201	228
Fuel Used (gal)	14.2	15.5	13.8	14.4	14.2	14.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	665	679	653	660	656	662
Vehs Exited	644	674	633	658	628	647
Starting Vehs	58	68	67	70	67	66
Ending Vehs	79	73	87	72	95	82
Travel Distance (mi)	431	449	419	441	426	433
Travel Time (hr)	19.8	22.3	19.2	19.9	19.7	20.2
Total Delay (hr)	5.2	7.0	4.9	4.9	5.2	5.4
Total Stops	247	250	218	223	201	228
Fuel Used (gal)	14.2	15.5	13.8	14.4	14.2	14.4

5: Cold Storage Facility Drive/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	8.7	1.1	0.1	0.1	5.7
Total Del/Veh (s)	16.3	20.9	38.7	47.3	18.2

Total Network Performance

Denied Del/Veh (s)	5.7
Total Del/Veh (s)	21.6

Intersection: 5: Cold Storage Facility Drive/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	R	R
Maximum Queue (ft)	257	239	11	528	55	30
Average Queue (ft)	159	83	2	304	15	9
95th Queue (ft)	276	234	12	557	59	30
Link Distance (ft)		2505		1078	321	442
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	700		75			
Storage Blk Time (%)				26		
Queuing Penalty (veh)				1		

Network Summary

Network wide Queuing Penalty: 1

Intersection: 5: Cold Storage Facility Drive/Beach St & W. Commercial

Phase	1	2	4	5	6
Movement(s) Served	WBL	EBTL	NBTL	EBL	WBTL
Maximum Green (s)	4.0	84.0	4.0	19.0	69.0
Minimum Green (s)	4.0	4.0	4.0	10.0	8.0
Recall	None	Min	None	None	Min
Avg. Green (s)	0.0	215.0	4.5	16.2	69.2
g/C Ratio	-0.01	-0.01	-0.01	NA	NA
Cycles Skipped (%)	100	71	63	0	0
Cycles @ Minimum (%)	0	0	38	11	0
Cycles Maxed Out (%)	0	29	38	44	63
Cycles with Peds (%)	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	685	686	675	669	684	680
Vehs Exited	647	653	640	657	667	654
Starting Vehs	55	54	64	73	77	62
Ending Vehs	93	87	99	85	94	92
Travel Distance (mi)	436	442	427	436	448	438
Travel Time (hr)	22.0	24.2	21.3	23.7	22.2	22.7
Total Delay (hr)	7.2	9.1	6.8	8.9	7.0	7.8
Total Stops	359	403	381	468	301	382
Fuel Used (gal)	15.0	15.9	14.5	15.5	15.3	15.2

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	685	686	675	669	684	680
Vehs Exited	647	653	640	657	667	654
Starting Vehs	55	54	64	73	77	62
Ending Vehs	93	87	99	85	94	92
Travel Distance (mi)	436	442	427	436	448	438
Travel Time (hr)	22.0	24.2	21.3	23.7	22.2	22.7
Total Delay (hr)	7.2	9.1	6.8	8.9	7.0	7.8
Total Stops	359	403	381	468	301	382
Fuel Used (gal)	15.0	15.9	14.5	15.5	15.3	15.2

5: Cold Storage Facility Drive/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	8.0	1.1	0.1	0.1	5.2
Total Del/Veh (s)	21.8	39.1	65.6	38.6	29.3

Total Network Performance

Denied Del/Veh (s)	5.2
Total Del/Veh (s)	32.8

Intersection: 5: Cold Storage Facility Drive/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	R
Maximum Queue (ft)	294	315	22	750	192	32
Average Queue (ft)	192	199	10	507	105	12
95th Queue (ft)	289	365	31	899	207	35
Link Distance (ft)		2505		1085	324	442
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	700		75			
Storage Blk Time (%)				35		
Queuing Penalty (veh)				3		

Network Summary

Network wide Queuing Penalty: 3

Intersection: 5: Cold Storage Facility Drive/Beach St & W. Commercial

Phase	1	2	4	5	6
Movement(s) Served	WBL	EBTL	NBTL	EBL	WBTL
Maximum Green (s)	4.0	81.0	7.0	19.0	66.0
Minimum Green (s)	4.0	4.0	4.0	10.0	8.0
Recall	None	Min	None	None	Min
Avg. Green (s)	0.0	108.6	7.6	18.2	71.5
g/C Ratio	-0.01	NA	NA	NA	NA
Cycles Skipped (%)	100	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	0	100	86	75	86
Cycles with Peds (%)	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	685	686	675	669	684	680
Vehs Exited	635	655	633	644	658	645
Starting Vehs	55	54	71	68	76	63
Ending Vehs	105	85	113	93	102	100
Travel Distance (mi)	432	440	423	432	447	435
Travel Time (hr)	23.7	24.8	22.0	24.8	23.6	23.8
Total Delay (hr)	9.1	9.8	7.6	10.1	8.4	9.0
Total Stops	463	415	427	515	371	437
Fuel Used (gal)	15.4	16.0	14.6	15.6	15.7	15.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	685	686	675	669	684	680
Vehs Exited	635	655	633	644	658	645
Starting Vehs	55	54	71	68	76	63
Ending Vehs	105	85	113	93	102	100
Travel Distance (mi)	432	440	423	432	447	435
Travel Time (hr)	23.7	24.8	22.0	24.8	23.6	23.8
Total Delay (hr)	9.1	9.8	7.6	10.1	8.4	9.0
Total Stops	463	415	427	515	371	437
Fuel Used (gal)	15.4	16.0	14.6	15.6	15.7	15.4

5: Cold Storage Facility Drive/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	8.1	1.2	0.1	0.1	5.3
Total Del/Veh (s)	26.6	48.5	52.2	54.5	35.3

Total Network Performance

Denied Del/Veh (s)	5.3
Total Del/Veh (s)	38.5

Intersection: 5: Cold Storage Facility Drive/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	R
Maximum Queue (ft)	368	374	47	879	153	22
Average Queue (ft)	252	218	16	617	89	5
95th Queue (ft)	388	407	73	975	160	20
Link Distance (ft)		2505		1085	324	442
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (ft)	700		75			
Storage Blk Time (%)				39		
Queuing Penalty (veh)				4		

Network Summary

Network wide Queuing Penalty: 4

Intersection: 5: Cold Storage Facility Drive/Beach St & W. Commercial

Phase	1	2	4	5	6
Movement(s) Served	WBL	EBT	NBTL	EBL	WBTL
Maximum Green (s)	4.0	81.0	7.0	23.0	62.0
Minimum Green (s)	4.0	4.0	4.0	10.0	8.0
Recall	None	Min	None	None	Min
Avg. Green (s)	0.0	103.3	7.2	22.7	66.7
g/C Ratio	-0.01	NA	NA	NA	NA
Cycles Skipped (%)	100	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	0	100	86	75	100
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA
Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	618	680	639	655	620	642
Vehs Exited	601	615	586	593	606	600
Starting Vehs	92	81	83	64	94	82
Ending Vehs	109	146	136	126	108	124
Travel Distance (mi)	366	381	357	368	357	366
Travel Time (hr)	37.5	46.2	48.2	39.0	45.4	43.3
Total Delay (hr)	25.0	33.1	35.9	26.4	33.2	30.7
Total Stops	595	713	761	581	527	636
Fuel Used (gal)	17.2	19.5	19.3	17.2	18.7	18.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	618	680	639	655	620	642
Vehs Exited	601	615	586	593	606	600
Starting Vehs	92	81	83	64	94	82
Ending Vehs	109	146	136	126	108	124
Travel Distance (mi)	366	381	357	368	357	366
Travel Time (hr)	37.5	46.2	48.2	39.0	45.4	43.3
Total Delay (hr)	25.0	33.1	35.9	26.4	33.2	30.7
Total Stops	595	713	761	581	527	636
Fuel Used (gal)	17.2	19.5	19.3	17.2	18.7	18.4

5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	3.1	147.9	0.1	0.3	75.8
Total Del/Veh (s)	44.5	95.5	87.8	126.3	69.1

Total Network Performance

Denied Del/Veh (s)	75.8
Total Del/Veh (s)	70.5

Intersection: 5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	TR	LT	R	TR
Maximum Queue (ft)	659	852	6	1118	112	44	257
Average Queue (ft)	460	324	1	1087	37	9	146
95th Queue (ft)	779	940	8	1202	119	43	277
Link Distance (ft)		2200		1078	321	321	442
Upstream Blk Time (%)				52			
Queuing Penalty (veh)				0			
Storage Bay Dist (ft)	700		75				
Storage Blk Time (%)	5	7		42			
Queuing Penalty (veh)	48	35		1			

Network Summary

Network wide Queuing Penalty: 84

Intersection: 5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial

Phase	1	2	4	5	6	8
Movement(s) Served	WBL	EBTL	NBTL	EBL	WBTL	SBT
Maximum Green (s)	4.0	91.0	7.0	23.0	72.0	7.0
Minimum Green (s)	4.0	4.0	4.0	10.0	8.0	4.0
Recall	None	Min	None	None	Min	None
Avg. Green (s)	0.0	109.7	7.4	23.6	81.6	7.4
g/C Ratio	-0.01	NA	NA	NA	NA	NA
Cycles Skipped (%)	100	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	0	100	100	100	100	100
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	621	693	653	663	630	652
Vehs Exited	601	620	587	602	610	604
Starting Vehs	93	80	85	69	92	82
Ending Vehs	113	153	151	130	112	131
Travel Distance (mi)	363	377	356	367	359	365
Travel Time (hr)	38.9	46.6	47.8	39.3	45.2	43.6
Total Delay (hr)	26.5	33.7	35.6	26.7	32.9	31.1
Total Stops	615	711	739	591	551	641
Fuel Used (gal)	17.5	19.5	19.1	17.3	18.7	18.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	621	693	653	663	630	652
Vehs Exited	601	620	587	602	610	604
Starting Vehs	93	80	85	69	92	82
Ending Vehs	113	153	151	130	112	131
Travel Distance (mi)	363	377	356	367	359	365
Travel Time (hr)	38.9	46.6	47.8	39.3	45.2	43.6
Total Delay (hr)	26.5	33.7	35.6	26.7	32.9	31.1
Total Stops	615	711	739	591	551	641
Fuel Used (gal)	17.5	19.5	19.1	17.3	18.7	18.4

5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	3.1	145.3	0.2	0.3	73.1
Total Del/Veh (s)	44.1	96.7	124.5	132.8	71.5

Total Network Performance

Denied Del/Veh (s)	73.1
Total Del/Veh (s)	72.8

Intersection: 5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	R
Maximum Queue (ft)	652	944	11	1128	214	301
Average Queue (ft)	451	277	2	1080	117	170
95th Queue (ft)	749	815	12	1239	217	334
Link Distance (ft)		2200		1085	324	442
Upstream Blk Time (%)				52		
Queuing Penalty (veh)				0		
Storage Bay Dist (ft)	700		75			
Storage Blk Time (%)	9	4		43		
Queuing Penalty (veh)	81	23		3		

Network Summary

Network wide Queuing Penalty: 106

Intersection: 5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial

Phase	1	2	4	5	6
Movement(s) Served	WBL	EBTL	NBTL	EBL	WBTL
Maximum Green (s)	4.0	90.0	8.0	23.0	71.0
Minimum Green (s)	4.0	4.0	4.0	10.0	8.0
Recall	None	Min	None	None	Min
Avg. Green (s)	0.0	108.3	8.5	23.4	71.0
g/C Ratio	-0.01	NA	NA	NA	NA
Cycles Skipped (%)	100	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	0	100	100	100	100
Cycles with Peds (%)	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:15	7:15	7:15	7:15	7:15	7:15
Total Time (min)	18	18	18	18	18	18
Time Recorded (min)	15	15	15	15	15	15
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	623	671	631	657	625	642
Vehs Exited	578	585	547	570	599	576
Starting Vehs	95	81	84	71	96	85
Ending Vehs	140	167	168	158	122	149
Travel Distance (mi)	358	366	332	352	355	353
Travel Time (hr)	40.7	50.2	53.4	42.3	47.5	46.8
Total Delay (hr)	28.5	37.7	42.0	30.2	35.4	34.7
Total Stops	668	797	906	713	601	736
Fuel Used (gal)	17.8	20.2	19.9	17.7	19.2	18.9

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	623	671	631	657	625	642
Vehs Exited	578	585	547	570	599	576
Starting Vehs	95	81	84	71	96	85
Ending Vehs	140	167	168	158	122	149
Travel Distance (mi)	358	366	332	352	355	353
Travel Time (hr)	40.7	50.2	53.4	42.3	47.5	46.8
Total Delay (hr)	28.5	37.7	42.0	30.2	35.4	34.7
Total Stops	668	797	906	713	601	736
Fuel Used (gal)	17.8	20.2	19.9	17.7	19.2	18.9

5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	6.9	148.7	0.2	0.3	76.7
Total Del/Veh (s)	74.9	97.5	106.0	125.3	87.2

Total Network Performance

Denied Del/Veh (s)	76.7
Total Del/Veh (s)	88.0

Intersection: 5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	R
Maximum Queue (ft)	739	1740	11	1128	212	276
Average Queue (ft)	572	652	2	1090	109	154
95th Queue (ft)	847	1958	13	1223	218	291
Link Distance (ft)		2200		1085	324	442
Upstream Blk Time (%)		6		52		
Queuing Penalty (veh)		0		0		
Storage Bay Dist (ft)	700		75			
Storage Blk Time (%)	17	12		43		
Queuing Penalty (veh)	153	59		3		

Network Summary

Network wide Queuing Penalty: 215

Intersection: 5: Maine Internationa Cold Storage Facility/Beach St & W. Commercial

Phase	1	2	4	5	6	8
Movement(s) Served	WBL	EBT	NBTL	EBL	WBTL	SBR
Maximum Green (s)	4.0	90.0	8.0	26.0	68.0	8.0
Minimum Green (s)	4.0	4.0	4.0	10.0	8.0	4.0
Recall	None	Min	None	None	Min	None
Avg. Green (s)	0.0	108.5	8.4	26.6	68.0	8.4
g/C Ratio	-0.01	NA	NA	NA	NA	NA
Cycles Skipped (%)	100	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	0	100	100	100	100	100
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

TRIP GENERATION ANALYSIS
PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

INTRODUCTION

Trip generation analysis has been performed for the proposed Maine International Cold Storage Facility to be located adjacent to the International Marine Terminal (IMT) in Portland, Maine. The proposed facility will be 108,000 square feet (S.F.) in size. The facility is expected to employ a maximum of 25 employees, which will be spread over at least two shifts. Access to the facility will be provided by a single full movement signalized drive to Commercial Street, directly opposite Beach Street, and by an internal connection to the IMT. The facility is projected to generate a maximum of 70 trucks per day or 140 one-way truck trips. The majority of these truck trips (75 %) are expected to occur between 6:00 AM and 12:00 noon with the remaining 25 % occurring in the afternoon. It is expected that the facility will reduce off-site truck trips from the adjacent IMT since there is no available cold storage at the IMT now.

The City of Portland has requested that the trip generation analysis also look at the adjacent IMT trips to determine if a Traffic Movement Permit (TMP) will be required under Common Scheme of Development rules.

TRIP GENERATION ANALYSIS

The number of trips to be generated by the proposed storage facility was estimated using the most recent Institute of Transportation Engineers (ITE) "Trip Generation, 10th Edition" report. The calculations were performed utilizing Land Use Code 150 - Warehousing on the basis of both employees and square footage. The results on the basis of 108,000 S.F. and 25 employees are summarized in the table below:

	10th Edition ITE (one-way trip ends)		
Time Period	Emp.	S.F.	Average
Weekday	126	188	158
AM Peak Hour – Adjacent Street	15	18	17
AM Peak Hour – Generator	17	24	21
PM Peak Hour – Adjacent Street	17	21	19
PM Peak Hour – Generator	17	26	22

As seen in the preceding table, the employee and square footage bases yielded quite similar results so they were averaged to best estimate expected site trips.

SITE SPECIFIC ESTIMATES

Given the availability of specific truck and employee numbers, trip generation was also estimated specific to this site. The facility expects 53 trucks from 6:00 AM to noon, or 9 per hour. To allow for some peaking within that period, 12 trucks are assumed for this analysis, equal to 24 one-way truck trips. The ITE estimates on an employee basis appear reasonable for the facility even though those numbers would have included some trucks. Assuming 15 employee trips and 24 truck trips gives us an AM peak hour estimate of 39 one-way trips. Only 17 trucks are anticipated in the afternoon period, from noon to 6:00 PM, which equates to approximately 3 trucks per hour. To allow for peaking within this slower period, 6 trucks are assumed during the PM peak hour with 15 employee trips for 21 PM peak hour trips. This PM estimate is virtually identical to the ITE result of 22, which will be utilized for the remainder of this analysis to be conservative.

PERMITTING REQUIREMENTS

The trips must be converted to passenger car equivalents (PCEs) to determine if a Traffic Movement Permit (TMP) is required under state law. For these calculations, each truck trip equals two PCES. The peak hour calculations are as follows:

AM Peak Hour – 24 trucks x 2.0 PCEs = 48 PCEs + 15 employee PCEs = 63 PCEs

PM Peak Hour – 7 trucks X 2.0 PCEs = 14 PCEs + 15 employee PCEs = 29 PCEs

Based upon these results, expected to be conservative, a TMP would not be required for the Cold Storage facility since peak hour trip generation will not exceed the 100-trip threshold, defined in terms of PCEs. However, the City of Portland has requested that trips generated by the adjacent IMT also be considered.

IMT TRIP GENERATION

Trips to and from the IMT were recorded in turning movement and classification counts performed in 2019 by Gorrill Palmer and Traffic Solutions. These counts were conducted as follows:

Intersection	Date/Count Period	Peak Hour
W. Commercial St, Beach St. & Site Drive	8/13/2019 7 – 9 AM	7:30 – 8:30 AM
W. Commercial St, Beach St. & Site Drive	8/13/2019 3 – 6 PM	4:45 - 5:45 PM
W. Commercial Street & IMT Drive	11/14/2019 7 – 9 AM	7:30 – 8:30 AM
W. Commercial Street & IMT Drive	11/14/2019 4 – 6 PM	4:30 – 5:30 PM

The count records are attached to this memorandum. The counts were summarized in terms of passenger car equivalents for the AM and PM peak hours of both the adjacent street system and the peak hour of the IMT. The AM results are shown in Figure 1 while the PM results are summarized in Figure 2. As seen in these figures, during the AM peak hour of the IMT it generated 33 PCEs. During the PM peak hour of the IMT it generated 28 PCEs. These trips are added to the projected peak hours for the International Cold Storage Facility as follows:

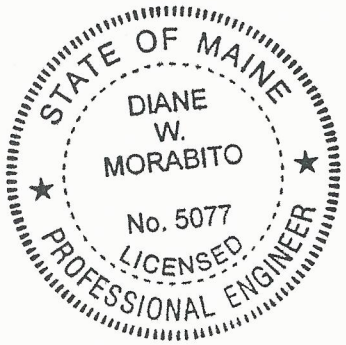
AM Peak Hour – 63 PCEs Cold Storage + 33 PCEs IMT = 96 PCEs

PM Peak Hour –29 PCEs Cold Storage + 28 PCEs IMT = 57 PCEs

As seen above, the total PCEs for the site after development of the cold storage will be 96 during the AM peak hour and 57 during the PM peak hour. These estimates are expected to be conservative since they are based upon the following assumptions:

- Both the IMT and Cold Storage facilities will peak during the exact same hours of the day
- Both the employee trips and truck trips for the cold storage facility will peak during the same hours
- The cold storage facility is expected to reduce off-site trips from the IMT since there is no cold storage currently available

To summarize, based upon the preceding analysis, assumed to be conservative for the stated reasons, a TMP should not be required for the proposed International Cold Storage Facility, even with consideration of the existing IMT trips.



Sincerely,

Diane W. Morabito

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering

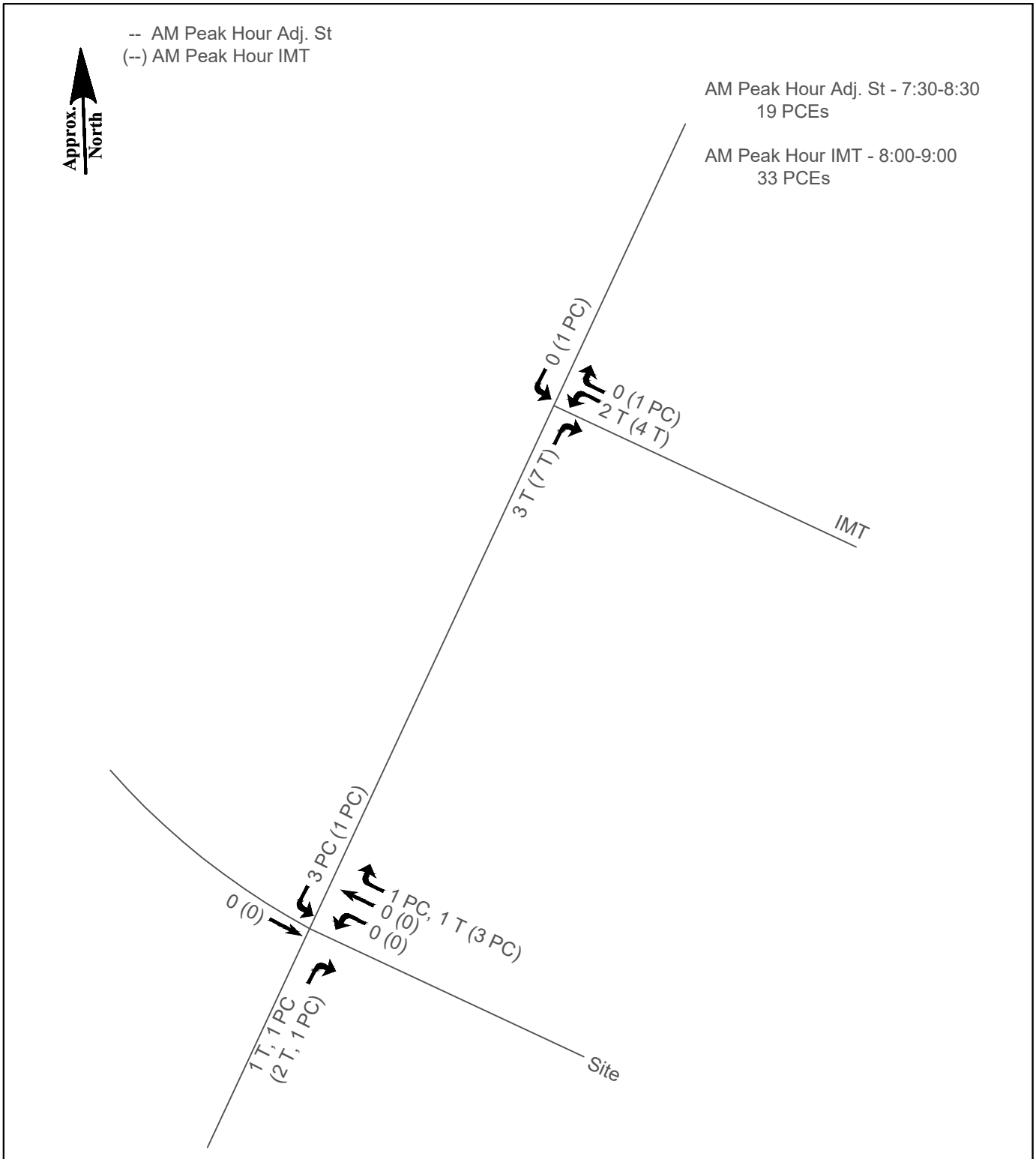


Figure 1

AM IMT Trip Generation
Cold Storage Facility
Portland, Maine

Sewall
The evolution of expertise
A TRC Company

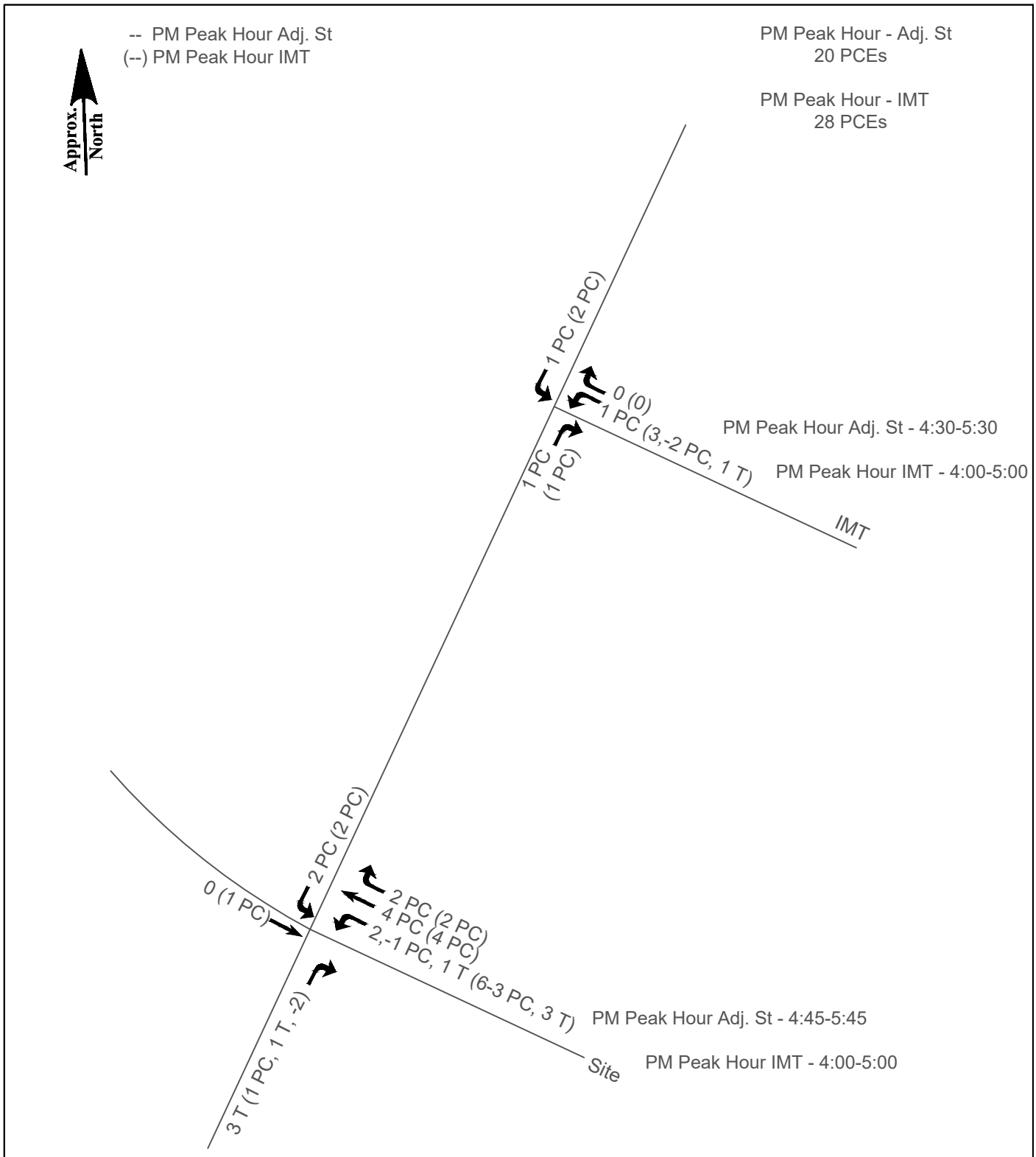


Figure 2

PM IMT Trip Generation
Cold Storage Facility
Portland, Maine

Gorrill Palmer

707 Sable Oaks Drive, Suite 30
South Portland, Maine 04106
Engineering Excellence Since 1988

Location: Portland, ME
Counter: TPG
Board: 2
Weather: Clear

File Name : AM IMT
Site Code : 003541
Start Date : 11/14/2019
Page No : 1

Groups Printed- Passenger Cars - Single Unit Trucks - Heavy Trucks

	COMMERCIAL ST From North					IMT From East					COMMERCIAL ST From South					IMT From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	120	0	0	120	0	0	0	0	0	0	160	0	0	160	0	0	0	0	0	280
07:15 AM	0	175	1	0	176	1	0	0	0	1	0	176	0	0	176	0	0	0	0	0	353
07:30 AM	0	193	0	0	193	0	0	0	0	0	0	220	0	0	220	0	0	0	0	0	413
07:45 AM	0	216	0	0	216	0	0	0	0	0	0	252	0	0	252	0	0	0	0	0	468
Total	0	704	1	0	705	1	0	0	0	1	0	808	0	0	808	0	0	0	0	0	1514
08:00 AM	0	155	0	0	155	0	0	1	0	1	1	251	0	0	252	0	0	0	0	0	408
08:15 AM	0	166	0	0	166	0	0	1	0	1	2	310	0	0	312	0	0	0	0	0	479
08:30 AM	0	155	1	0	156	0	0	1	0	1	1	250	0	0	251	0	0	0	0	0	408
08:45 AM	0	175	0	0	175	1	0	1	0	2	3	236	0	0	239	0	0	0	0	0	416
Total	0	651	1	0	652	1	0	4	0	5	7	1047	0	0	1054	0	0	0	0	0	1711
Grand Total	0	1355	2	0	1357	2	0	4	0	6	7	1855	0	0	1862	0	0	0	0	0	3225
Apprch %	0	99.9	0.1	0		33.3	0	66.7	0		0.4	99.6	0	0		0	0	0	0		
Total %	0	42	0.1	0	42.1	0.1	0	0.1	0	0.2	0.2	57.5	0	0	57.7	0	0	0	0	0	
Passenger Cars	0	1315	2	0	1317	1	0	0	0	1	0	1821	0	0	1821	0	0	0	0	0	3139
% Passenger Cars	0	97	100	0	97.1	50	0	0	0	16.7	0	98.2	0	0	97.8	0	0	0	0	0	97.3
Single Unit Trucks	0	30	0	0	30	0	0	0	0	0	0	22	0	0	22	0	0	0	0	0	52
% Single Unit Trucks	0	2.2	0	0	2.2	0	0	0	0	0	0	1.2	0	0	1.2	0	0	0	0	0	1.6
Heavy Trucks	0	10	0	0	10	1	0	4	0	5	7	12	0	0	19	0	0	0	0	0	34
% Heavy Trucks	0	0.7	0	0	0.7	50	0	100	0	83.3	100	0.6	0	0	1	0	0	0	0	0	1.1

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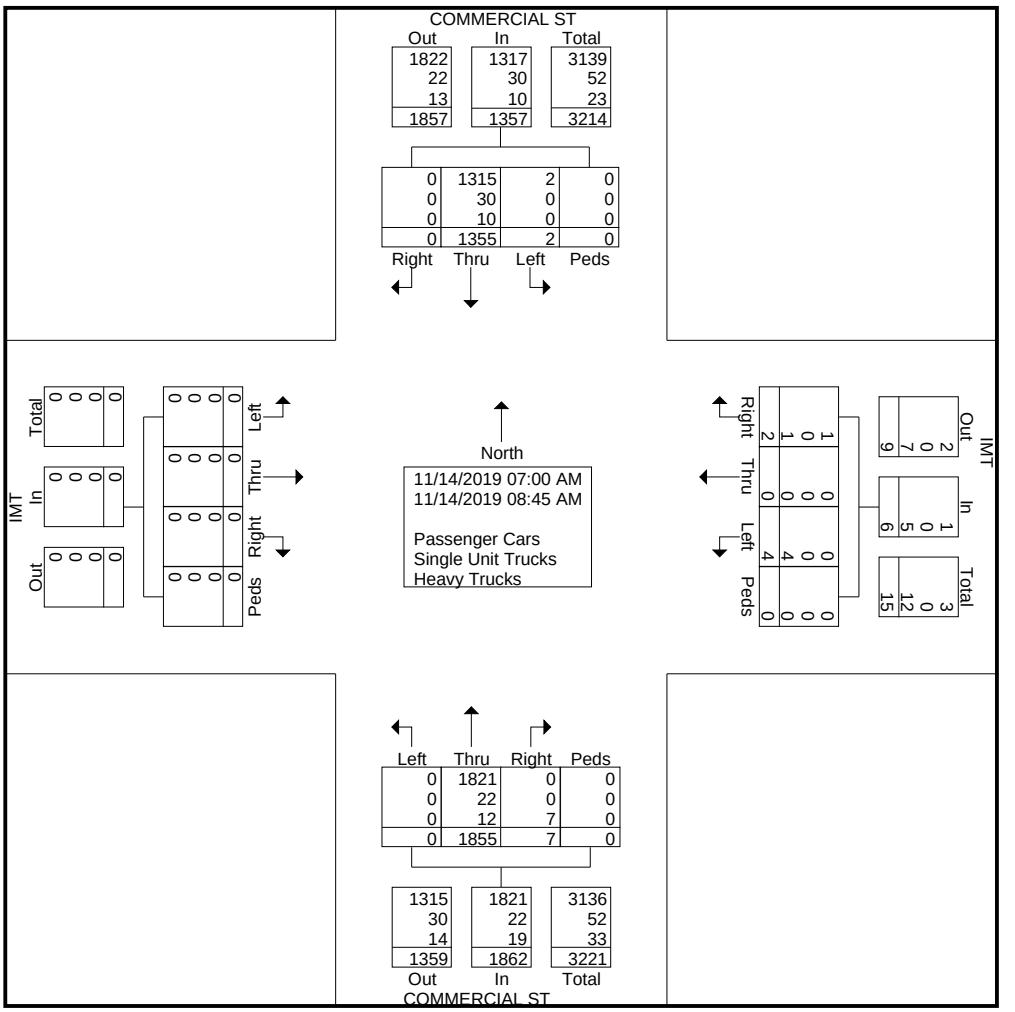

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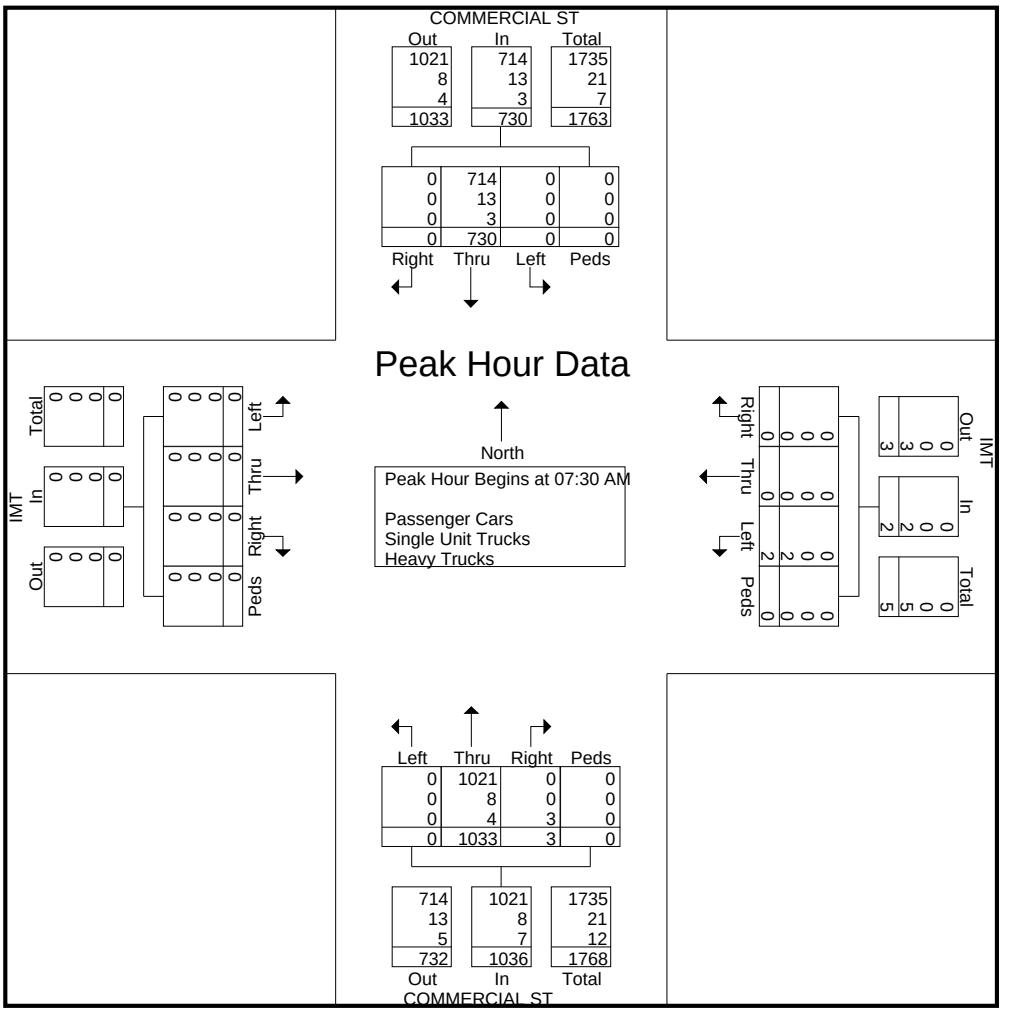
Location: Portland, ME
Counter: TPG
Board: 2
Weather: Clear

File Name : AM IMT
Site Code : 003541
Start Date : 11/14/2019
Page No : 3

	COMMERCIAL ST From North					IMT From East					COMMERCIAL ST From South					IMT From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	193	0	0	193	0	0	0	0	0	0	220	0	0	220	0	0	0	0	0	413
07:45 AM	0	**216**	0	0	**216**	0	0	0	0	0	0	252	0	0	252	0	0	0	0	0	468
08:00 AM	0	155	0	0	155	0	0	**1**	0	**1**	1	251	0	0	252	0	0	0	0	0	408
08:15 AM	0	166	0	0	166	0	0	1	0	1	**2**	**310**	0	0	**312**	0	0	0	0	0	**479**
Total Volume	0	730	0	0	730	0	0	2	0	2	3	1033	0	0	1036	0	0	0	0	0	1768
% App. Total	0	100	0	0		0	0	100	0		0.3	99.7	0	0		0	0	0	0		
PHF	.000	.845	.000	.000	.845	.000	.000	.500	.000	.500	.375	.833	.000	.000	.830	.000	.000	.000	.000	.000	.923
Passenger Cars	0	714	0	0	714	0	0	0	0	0	0	1021	0	0	1021	0	0	0	0	0	1735
% Passenger Cars	0	97.8	0	0	97.8	0	0	0	0	0	0	98.8	0	0	98.6	0	0	0	0	0	98.1
Single Unit Trucks	0	13	0	0	13	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	21
% Single Unit Trucks	0	1.8	0	0	1.8	0	0	0	0	0	0	0.8	0	0	0.8	0	0	0	0	0	1.2
Heavy Trucks	0	3	0	0	3	0	0	2	0	2	3	4	0	0	7	0	0	0	0	0	12
% Heavy Trucks	0	0.4	0	0	0.4	0	0	100	0	100	100	0.4	0	0	0.7	0	0	0	0	0	0.7



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Location: Portland, ME
Counter: TPG
Board: 2
Weather: Clear

File Name : PM IMT
Site Code : 003541
Start Date : 11/14/2019
Page No : 1

Groups Printed- Passenger Cars - Single Unit Trucks - Heavy Trucks

	COMMERCIAL ST From North					IMT From East					COMMERCIAL ST From South					IMT From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	242	0	0	242	0	0	1	0	1	0	128	0	0	128	0	0	0	0	0	371
04:15 PM	0	238	1	0	239	0	0	1	0	1	0	95	0	0	95	0	0	0	0	0	335
04:30 PM	0	269	0	0	269	0	0	0	0	0	1	112	0	0	113	0	0	0	0	0	382
04:45 PM	0	269	1	0	270	0	0	1	0	1	0	107	0	0	107	0	0	0	0	0	378
Total	0	1018	2	0	1020	0	0	3	0	3	1	442	0	0	443	0	0	0	0	0	1466
05:00 PM	0	248	0	0	248	0	0	0	0	0	0	98	0	0	98	0	0	0	0	0	346
05:15 PM	0	234	0	0	234	0	0	0	0	0	0	134	0	0	134	0	0	0	0	0	368
05:30 PM	0	207	0	0	207	0	0	0	0	0	0	137	0	0	137	0	0	0	0	0	344
05:45 PM	0	227	0	0	227	0	0	0	0	0	0	84	0	0	84	0	0	0	0	0	311
Total	0	916	0	0	916	0	0	0	0	0	0	453	0	0	453	0	0	0	0	0	1369
Grand Total	0	1934	2	0	1936	0	0	3	0	3	1	895	0	0	896	0	0	0	0	0	2835
Apprch %	0	99.9	0.1	0		0	0	100	0		0.1	99.9	0	0		0	0	0	0		
Total %	0	68.2	0.1	0	68.3	0	0	0.1	0	0.1	0	31.6	0	0	31.6	0	0	0	0	0	
Passenger Cars	0	1911	2	0	1913	0	0	2	0	2	1	890	0	0	891	0	0	0	0	0	2806
% Passenger Cars	0	98.8	100	0	98.8	0	0	66.7	0	66.7	100	99.4	0	0	99.4	0	0	0	0	0	99
Single Unit Trucks	0	19	0	0	19	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	24
% Single Unit Trucks	0	1	0	0	1	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0.8
Heavy Trucks	0	4	0	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	5
% Heavy Trucks	0	0.2	0	0	0.2	0	0	33.3	0	33.3	0	0	0	0	0	0	0	0	0	0	0.2

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Location: Portland, ME
Counter: TPG
Board: 2
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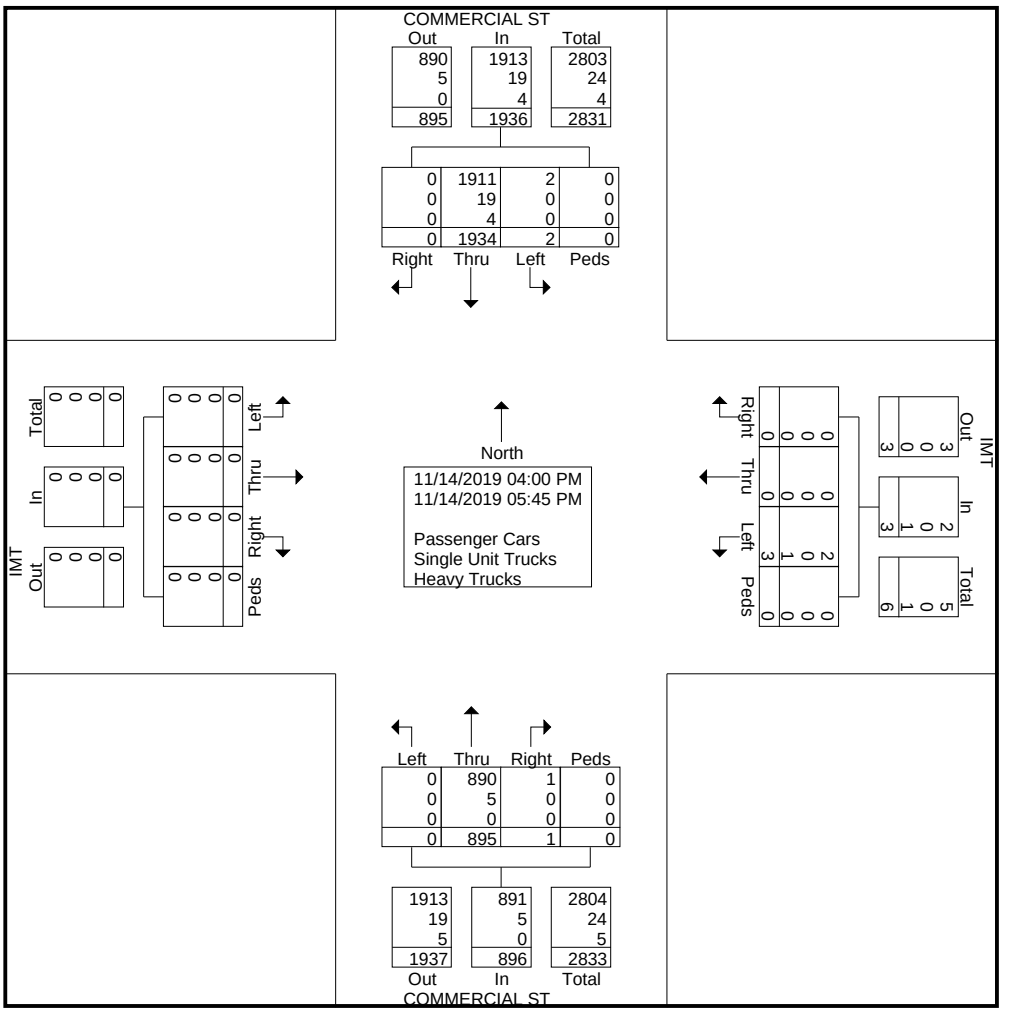
File Name : PM IMT
Site Code : 003541
Start Date : 11/14/2019
Page No : 2



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Location: Portland, ME
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Board: 2
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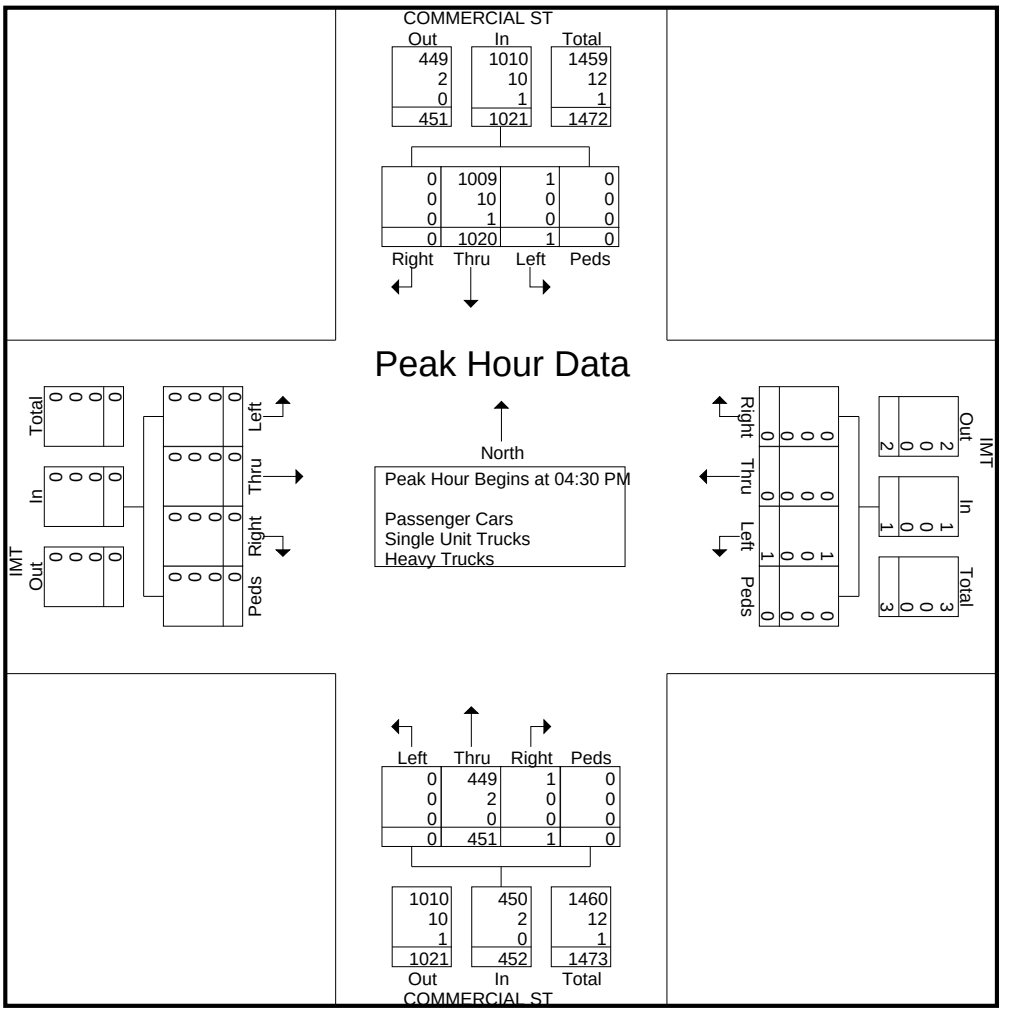
File Name : PM IMT
Site Code : 003541
Start Date : 11/14/2019
Page No : 3

	COMMERCIAL ST From North					IMT From East					COMMERCIAL ST From South					IMT From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**269**	0	0	269	0	0	0	0	0	**1**	112	0	0	113	0	0	0	0	0	**382**
04:45 PM	0	269	**1**	0	**270**	0	0	**1**	0	**1**	0	107	0	0	107	0	0	0	0	0	378
05:00 PM	0	248	0	0	248	0	0	0	0	0	0	98	0	0	98	0	0	0	0	0	346
05:15 PM	0	234	0	0	234	0	0	0	0	0	0	**134**	0	0	**134**	0	0	0	0	0	368
Total Volume	0	1020	1	0	1021	0	0	1	0	1	1	451	0	0	452	0	0	0	0	0	1474
% App. Total	0	99.9	0.1	0		0	0	100	0		0.2	99.8	0	0		0	0	0	0		
PHF	.000	.948	.250	.000	.945	.000	.000	.250	.000	.250	.250	.841	.000	.000	.843	.000	.000	.000	.000	.000	.965
Passenger Cars	0	1009	1	0	1010	0	0	1	0	1	1	449	0	0	450	0	0	0	0	0	1461
% Passenger Cars	0	98.9	100	0	98.9	0	0	100	0	100	100	99.6	0	0	99.6	0	0	0	0	0	99.1
Single Unit Trucks	0	10	0	0	10	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	12
% Single Unit Trucks	0	1.0	0	0	1.0	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.8
Heavy Trucks	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Heavy Trucks	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1



Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 1

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commerical St From North				Eimskip From East				W Commerical St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	12	129	0	141	0	0	0	0	0	166	40	206	19	0	0	19	366
07:15 AM	14	142	0	156	1	0	0	1	3	189	66	258	26	0	0	26	441
07:30 AM	17	182	0	199	0	0	0	0	0	230	86	316	21	0	0	21	536
07:45 AM	16	168	2	186	0	0	0	0	1	259	81	341	22	0	0	22	549
Total	59	621	2	682	1	0	0	1	4	844	273	1121	88	0	0	88	1892
08:00 AM	15	154	0	169	2	0	0	2	1	240	85	326	28	0	0	28	525
08:15 AM	14	138	1	153	0	0	0	0	0	268	81	349	18	0	0	18	520
08:30 AM	6	141	0	147	0	0	0	0	0	216	71	287	27	0	0	27	461
08:45 AM	16	114	0	130	1	0	0	1	1	192	86	279	26	0	0	26	436
Total	51	547	1	599	3	0	0	3	2	916	323	1241	99	0	0	99	1942

*** BREAK ***

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 2

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commerical St From North				Eimskip From East				W Commerical St From South				Beach St From West				
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Grand Total	110	1168	3	1281	4	0	0	4	6	1760	596	2362	187	0	0	187	3834
Apprch %	8.6	91.2	0.2		100	0	0		0.3	74.5	25.2		100	0	0		
Total %	2.9	30.5	0.1	33.4	0.1	0	0	0.1	0.2	45.9	15.5	61.6	4.9	0	0	4.9	
Passenger Car	101	1112	3	1216	1	0	0	1	4	1695	563	2262	183	0	0	183	3662
% Passenger Car	91.8	95.2	100	94.9	25	0	0	25	66.7	96.3	94.5	95.8	97.9	0	0	97.9	95.5
Truck	5	16	0	21	1	0	0	1	0	27	23	50	0	0	0	0	72
% Truck	4.5	1.4	0	1.6	25	0	0	25	0	1.5	3.9	2.1	0	0	0	0	1.9
Semi	4	36	0	40	2	0	0	2	2	27	9	38	0	0	0	0	80
% Semi	3.6	3.1	0	3.1	50	0	0	50	33.3	1.5	1.5	1.6	0	0	0	0	2.1
Bus	0	1	0	1	0	0	0	0	0	9	1	10	4	0	0	4	15
% Bus	0	0.1	0	0.1	0	0	0	0	0	0.5	0.2	0.4	2.1	0	0	2.1	0.4
Bicycle	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0	5
% Bicycle	0	0.3	0	0.2	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.1

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
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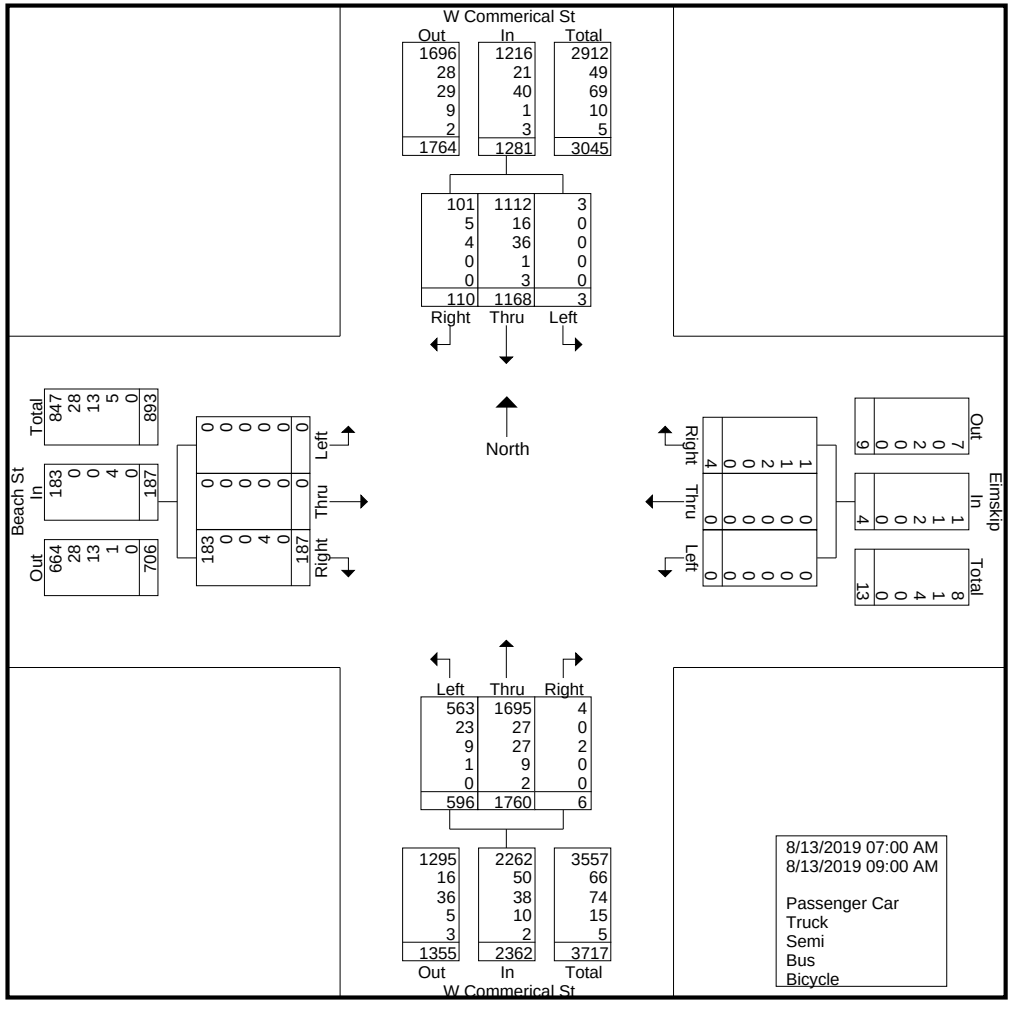

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August 13, 2019 AM
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File Name : Portland W Commercial St & Beach St 8-14-19 AM
Site Code : 00813191
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Page No : 5

	W Commerical St From North				Eimskip From East				W Commerical St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**17**	**182**	0	**199**	0	0	0	0	0	230	**86**	316	21	0	0	21	536
07:45 AM	16	168	**2**	186	0	0	0	0	**1**	259	81	341	22	0	0	22	**549**
08:00 AM	15	154	0	169	**2**	0	0	**2**	1	240	85	326	**28**	0	0	**28**	525
08:15 AM	14	138	1	153	0	0	0	0	0	**268**	81	**349**	18	0	0	18	520
Total Volume	62	642	3	707	2	0	0	2	2	997	333	1332	89	0	0	89	2130
% App. Total	8.8	90.8	0.4		100	0	0		0.2	74.8	25		100	0	0		
PHF	.912	.882	.375	.888	.250	.000	.000	.250	.500	.930	.968	.954	.795	.000	.000	.795	.970

Traffic Solutions

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Gorham, ME 04038

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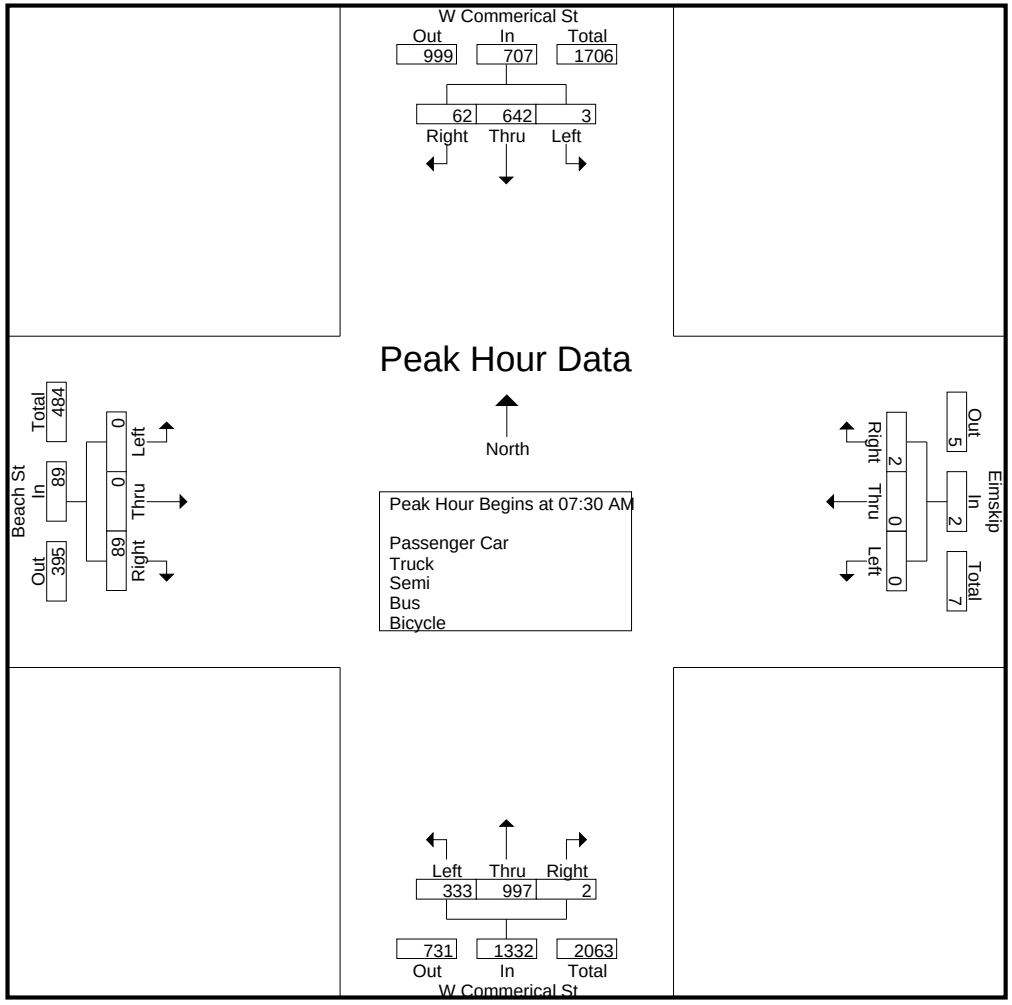

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 PM
Thunder Showers
Count by Jen Gilbert

File Name : Portland W Commercial St & Beach St 8-14-19 PM
Site Code : 00813192
Start Date : 8/13/2019
Page No : 1

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commercial St From North				Eimskip From East				W Commercial St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
03:00 PM	21	203	0	224	0	1	1	2	0	102	87	189	30	1	0	31	446
03:15 PM	23	208	2	233	2	1	4	7	1	106	92	199	15	0	0	15	454
03:30 PM	20	227	0	247	0	0	2	2	0	120	84	204	25	0	0	25	478
03:45 PM	16	177	1	194	1	1	2	4	3	136	66	205	21	0	1	22	425
Total	80	815	3	898	3	3	9	15	4	464	329	797	91	1	1	93	1803
04:00 PM	24	194	1	219	2	1	5	8	0	102	104	206	36	1	0	37	470
04:15 PM	13	217	0	230	0	0	0	0	0	117	117	234	37	0	0	37	501
04:30 PM	13	226	0	239	0	2	0	2	1	118	110	229	24	0	0	24	494
04:45 PM	19	239	1	259	0	1	1	2	1	156	95	252	28	0	0	28	541
Total	69	876	2	947	2	4	6	12	2	493	426	921	125	1	0	126	2006
05:00 PM	17	222	1	240	1	1	0	2	1	144	140	285	36	0	0	36	563
05:15 PM	19	241	0	260	1	2	0	3	1	175	88	264	39	0	0	39	566
05:30 PM	10	211	0	221	0	0	1	1	0	142	98	240	46	0	0	46	508
05:45 PM	25	232	0	257	0	0	0	0	0	124	85	209	14	0	1	15	481
Total	71	906	1	978	2	3	1	6	2	585	411	998	135	0	1	136	2118

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland W Commerical & Beach St
August 13, 2019 PM
Thunder Showers
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Site Code : 00813192
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Page No : 2

Groups Printed- Passenger Car - Truck - Semi - Bus - Bicycle

	W Commercial St From North				Eimskip From East				W Commercial St From South				Beach St From West				
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Grand Total	220	2597	6	2823	7	10	16	33	8	1542	1166	2716	351	2	2	355	5927
Apprch %	7.8	92	0.2		21.2	30.3	48.5		0.3	56.8	42.9		98.9	0.6	0.6		
Total %	3.7	43.8	0.1	47.6	0.1	0.2	0.3	0.6	0.1	26	19.7	45.8	5.9	0	0	6	
Passenger Car	216	2542	5	2763	7	10	7	24	7	1504	1150	2661	342	2	2	346	5794
% Passenger Car	98.2	97.9	83.3	97.9	100	100	43.8	72.7	87.5	97.5	98.6	98	97.4	100	100	97.5	97.8
Truck	1	27	0	28	0	0	0	0	0	15	7	22	3	0	0	3	53
% Truck	0.5	1	0	1	0	0	0	0	0	1	0.6	0.8	0.9	0	0	0.8	0.9
Semi	1	14	1	16	0	0	9	9	1	12	9	22	0	0	0	0	47
% Semi	0.5	0.5	16.7	0.6	0	0	56.2	27.3	12.5	0.8	0.8	0.8	0	0	0	0	0.8
Bus	1	7	0	8	0	0	0	0	0	5	0	5	6	0	0	6	19
% Bus	0.5	0.3	0	0.3	0	0	0	0	0	0.3	0	0.2	1.7	0	0	1.7	0.3
Bicycle	1	7	0	8	0	0	0	0	0	6	0	6	0	0	0	0	14
% Bicycle	0.5	0.3	0	0.3	0	0	0	0	0	0.4	0	0.2	0	0	0	0	0.2

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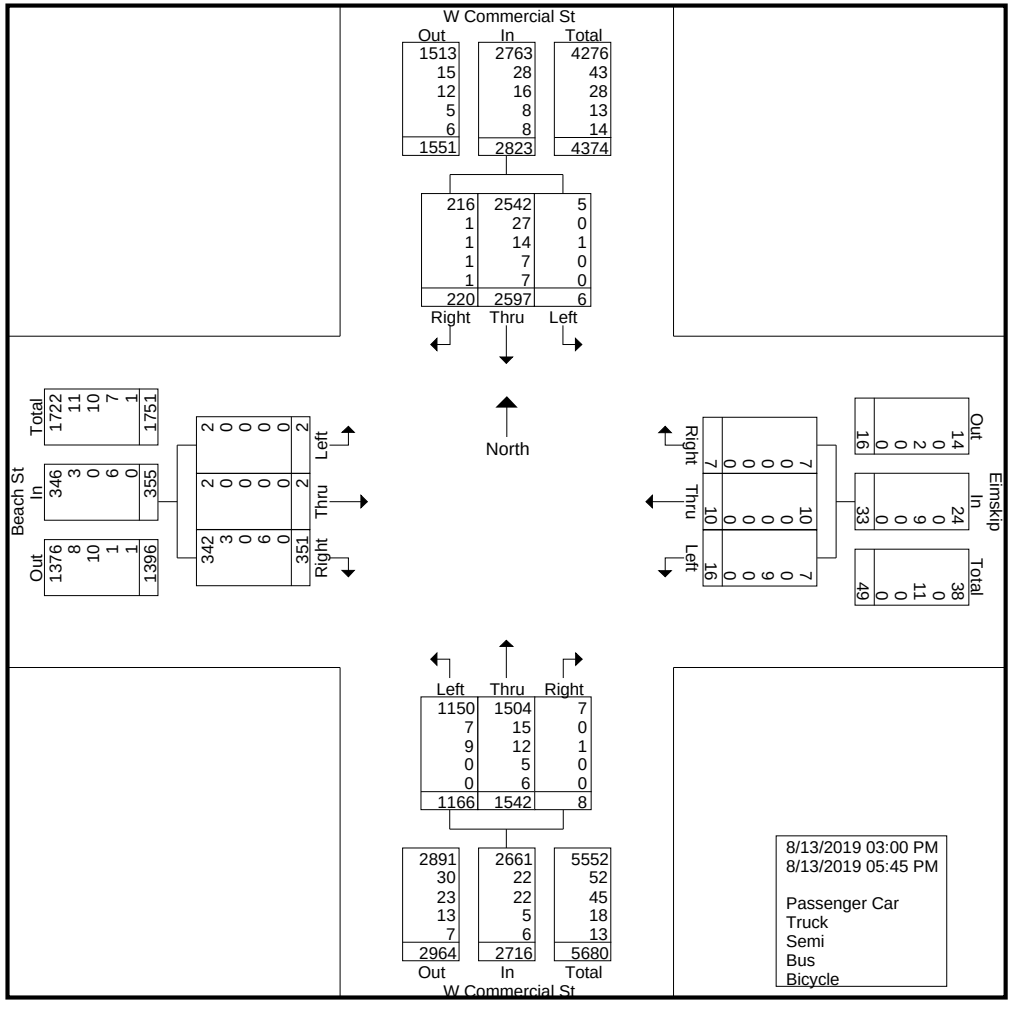

Traffic Solutions

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	W Commercial St From North				Eimskip From East				W Commercial St From South				Beach St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**19**	239	**1**	259	0	1	**1**	2	**1**	156	95	252	28	0	0	28	541
05:00 PM	17	222	1	240	**1**	1	0	2	1	144	**140**	**285**	36	0	0	36	563
05:15 PM	19	**241**	0	**260**	1	**2**	0	**3**	1	**175**	88	264	39	0	0	39	**566**
05:30 PM	10	211	0	221	0	0	1	1	0	142	98	240	**46**	0	0	**46**	508
Total Volume	65	913	2	980	2	4	2	8	3	617	421	1041	149	0	0	149	2178
% App. Total	6.6	93.2	0.2		25	50	25		0.3	59.3	40.4		100	0	0		
PHF	.855	.947	.500	.942	.500	.500	.500	.667	.750	.881	.752	.913	.810	.000	.000	.810	.962

Traffic Solutions

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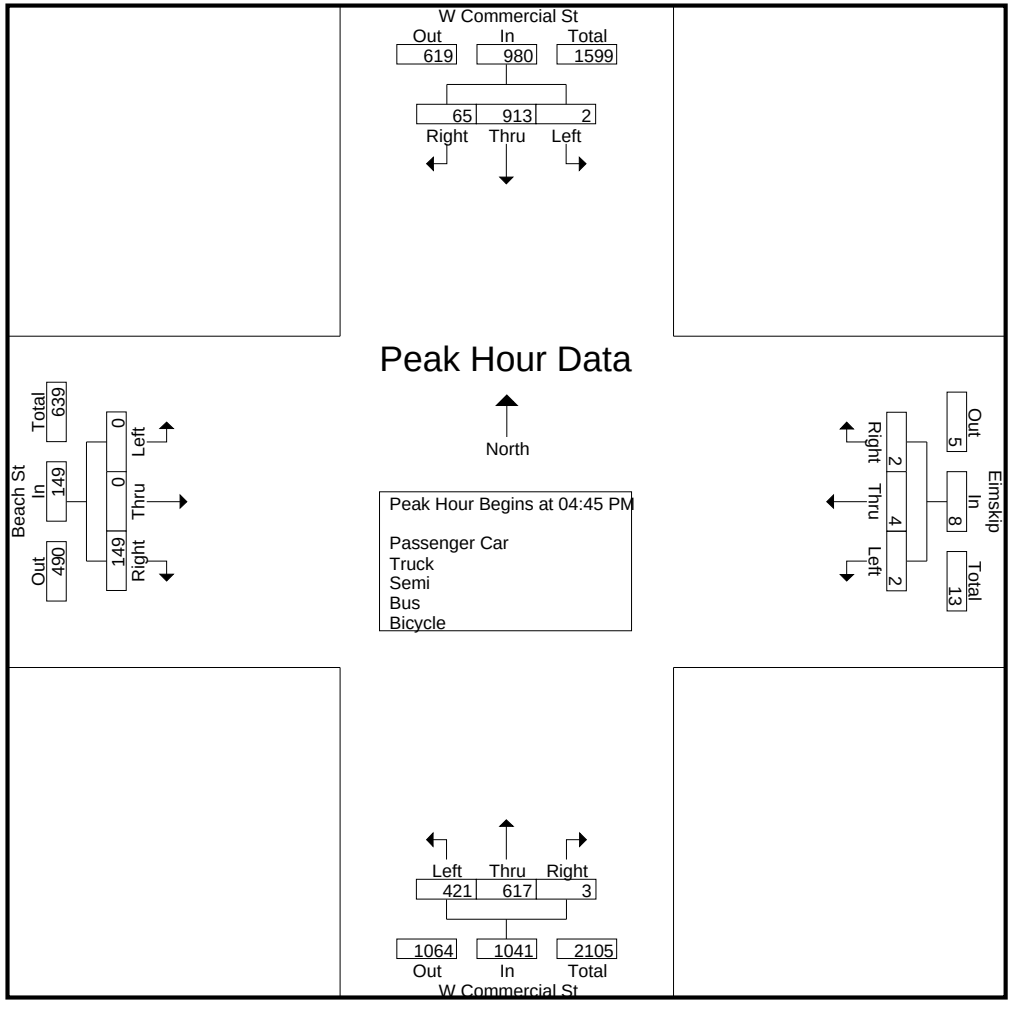

FLOOD HAZARD DEVELOPMENT PERMIT
For Minor Development

Portland, Maine

(For Development not considered a Substantial Improvement)

This Flood Hazard Development Permit allows minor development as provided in Article V.F.3. of the Floodplain Management Ordinance of Portland**, Maine, for development in a Special Flood Hazard Area as defined in said ordinance.** Development authorized by this permit must be adequately anchored to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads. including the effects of buoyancy. be constructed with materials resistant to flood damage and be constructed by methods and practices that minimize flood damage. This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the Floodplain Management Ordinance.

Tax Map: 59 Lot #: Block A, Lots 1,2,5-11

Project Description: Construction of a fire access drive and new stormwater outfall associated with upland development

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____ Date: _____
Signature

or

Authorized Agent: _____ Date: 5/18/2020
Signature

Issued by: _____ Date: _____

Permit #: _____

B-14

AMBER
INFRASTRUCTURE GROUP

February 28, 2020

City of Portland

Planning Board

389 Congress St, 4th Floor

Portland, ME 04101

Re: Maine International Cold Storage Facility – Authorization for Permitting

To Whom it May Concern:

On behalf of Maine International Cold Storage Facility, LLC, Woodard & Curran is authorized to apply for Planning Board approval for the proposed Maine International Cold Storage Facility to be located at approximately 40 West Commercial Street in Portland. Furthermore, Woodard & Curran is authorized to act on behalf of Maine International Cold Storage Facility, LLC throughout the permitting process.

Should you have any further questions, please do not hesitate to contact me at Tom.Oshaughnessy@amberinfrastructure.com

Regards,



Tom O'Shaughnessy, President Maine International Cold Storage Facility, LLC



BUILDING LAYOUT TABLE		
Point #	Northing	Easting
1	295867.59	2927302.56
2	295598.18	2927396.04
3	295716.89	2927738.20
4	295918.16	2927668.36
5	295931.97	2927708.02
6	295990.23	2927687.81
7	295977.23	2927650.34
8	295992.66	2927644.98
9	295911.91	2927412.25
10	295906.32	2927414.19

CENTERLINE ALIGNMENT LINE DATA						
Line #	Length	Direction	Start Point	End Point	Start Sta.	End Sta.
L1	91.76	S28°48'01"E	N:295,711.29 E:2,927,292.48	N:295,630.88 E:2,927,336.69	0+00.00	0+91.76
L2	314.88	N70°51'53"E	N:295,555.41 E:2,927,532.96	N:295,658.63 E:2,927,830.44	3+20.31	6+35.19

CENTERLINE ALIGNMENT CURVE DATA						
Curve	Length	Radius	Tangent	Delta	PC Sta.	PT Sta.
C1	228.54	163.00	137.59	80°20'06"	0+91.76	3+20.31
C2	39.88	42.00	21.59	54°24'00"	6+35.19	6+75.07
C3	401.62	770.00	205.49	29°53'04"	6+75.07	10+76.69

WOODARD & CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

THIS DOCUMENT IS THE PROPERTY OF WOODARD & CURRAN INC. AND ITS CLIENT. IT SHALL NOT BE USED FOR ANY PURPOSE OR PROJECT WITHOUT THE EXPRESSED WRITTEN CONSENT OF WOODARD & CURRAN INC.

STATE OF MAINE
DARRIN B. STAIRS
No. 15118
LICENSED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
1	RESPONSE TO CITY COMMENTS	4-15-2020
2	80 PLANNING PROGRESS SET	3-26-20

DESIGNED BY: ANL | DRAWN BY: BDH | CHECKED BY: DS | 0232277.00 Map

MAINE PORT AUTHORITY
PORTLAND, MAINE

MAINE PORT AUTHORITY
COLD STORAGE FACILITY

SITE PLAN

JOB NO.:0232277.00
DATE: MAY 2020
SCALE: AS NOTED
SHEET: 4 OF XX

C-100

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\Civil\0232277.00 C100.dwg, May 15, 2020 - 3:14pm

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

Maine International Cold Storage Facility
Statement of Compliance with City of Portland Flood Plain Management Regulations

The proposed work is located on waterfront associated with the proposed Maine International Cold Storage Facility located at 40 West Commercial Street in Portland, Maine. The building included in the proposed development will be located outside of the shoreland zone. A portion of the building will be located within the Flood Zone AE. The work within the shoreland zone consists of site work, including the construction of a subsurface stormwater management system and a new 36" stormwater outfall, a fire access road and electrical infrastructure for lighting. The project will comply with the standards provided in Section 14-450.8 of the City's Land Use Code; these standards are provided below in italics for your reference, followed by a description of how the proposed project will comply:

(a) *All development: All development shall:*

1. *Be designed or modified and adequately anchored to prevent flotation (excluding piers and docks), collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;*

   All improvements are designed to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

2. *Use construction materials that are resistant to flood damage;*

   Construction materials that are resistant to flood damage have been specified.

3. *Use construction methods and practices that will minimize flood damage; and*

   Construction methods and practices that will minimize flood damage will be utilized.

4. *Use electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during flooding conditions.*

   Services for electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities associated with the upland development have been located outside of the floodplain to the greatest extent possible. Underground electrical services associated with lighting infrastructure within the shoreland zone will be designed to prevent water from entering or accumulating within the components during flooding conditions.

(b) *Water supply: All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems.*

Water services are not proposed in the Shoreland Zone; this Standard does not apply.

(c) *Sanitary sewage systems: All new and replacement sanitary sewage systems shall be designed and located to minimize or eliminate infiltration of flood waters into the system and discharges from the system into flood waters.*

The proposed work does not include new or replacement sanitary sewage systems in the Shoreland Zone; this Standard does not apply.

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(d) *On-site waste disposal systems: On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during floods.*

The proposed work does not include on-site waste disposal systems; this Standard does not apply.

(e) *Watercourse carrying capacity: All development associated with altered or relocated portions of a watercourse shall be constructed and maintained in such a manner that no reduction occurs in the flood carrying capacity of the watercourse.*

The proposed work does not include any watercourse alterations that will result in a reduction of flood carrying capacity of the watercourse.

(f) *Residential: New construction or substantial improvement of any residential structure located within:*

1. *Zones A1-30, AE, and AH shall have the lowest floor (including basement) elevated to at least two (2) feet above the base flood elevation.*
2. *Zones AO and AH shall have adequate drainage paths around structures on slopes, to guide flood water away from the proposed structures.*
3. *Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:*
    a. *At least two (2) feet higher than the depth specified in feet on the community's Flood Insurance Rate Map; or*
    b. *At least three (3) feet if no depth number is specified.*
4. *Zone A shall have the lowest floor (including basement) elevated to at least two (2) feet above the base flood elevation utilizing information obtained pursuant to section 14-450.6(b)4.a.ii.; section 14-450.7(b)4; or section 14-450.7(c)1.*
5. *Zones V1-30 and VE shall meet the requirements of section 14-450.8(p).*

The proposed work does not include residential structures; this Standard does not apply.

(g) *Nonresidential: New construction or substantial improvement of any nonresidential structure located within:*

1. *Zones A1-30, AE, and AH shall have the lowest floor (including basement) elevated to at least two (2) feet above the base flood elevation, or together with attendant utility and sanitary facilities shall:*
    a. *Be floodproofed to at least two (2) feet above the base flood elevation so that below that elevation the structure is watertight with walls substantially impermeable to the passage of water;*
    b. *Have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and*
    c. *Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a flood hazard development permit, as required by section 14-450.6(b)4d and shall include a record of the elevation above mean sea level to which the structure is floodproofed.*
2. *Zones AO and AH shall have adequate drainage paths around structures on slopes, to guide flood water away from the proposed structures.*

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3. *Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:*
    a. *At least two (2) feet higher than the depth specified in feet on the community's Flood Insurance Rate Map; or*
    b. *At least three (3) feet if no depth number is specified; or*
    c. *Together with attendant utility and sanitary facilities be floodproofed to meet the elevation requirements of this section and floodproofing standards of section 14-450.8(g).*
4. *Zone A shall have the lowest floor (including basement) elevated to at least two (2) feet above the base flood elevation utilizing information obtained pursuant to section 14-450.6(b)4.a.ii.; section 14-450.7(b)4; section 14-450.7(c)1; or*
5. *Zones V1-30 and VE shall meet the requirements of section 14-450.8(p).*

A portion of the proposed development is located within Flood Zone AE and FEMA Special Flood Hazard Zone A2 with a 100-year flood elevation of 10. The project will comply with the applicable requirements. A portion of the building will be located within Zone AE. The lowest floor elevation of the proposed building (14 feet) is located more than two feet above the 100-year flood elevation (10 feet). The ground surface elevation along the southern edge of the building will be raised above elevation 11 for flood protection. Design plans will be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice.

(h) *Manufactured homes: New or substantially improved manufactured homes located within:*
1. *Zones A1-30, AE, and AH shall:*
    a. *Be elevated on a permanent foundation such that the lowest floor is at least two (2) feet above the base flood elevation; and*
    b. *Be securely anchored to an adequately anchored foundation system to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to:*
        i. *Over-the-top ties anchored to the ground at the four (4) corners of the manufactured home, plus two (2) additional ties per side at intermediate points (manufactured homes less than fifty (50) feet long require one (1) additional tie per side); or by*
        ii. *Frame ties at each corner of the home, plus five (5) additional ties along each side at intermediate points (manufactured homes less than fifty (50) feet long require four (4) additional ties per side).*
        iii. *All components of the anchoring system described in section 14-450.8(h)1.b.i. and ii. Shall be capable of carrying a force of four thousand eight hundred (4,800) pounds.*
2. *Zones AO and AH shall have adequate drainage paths around structures on slopes, to guide flood water away from the proposed structures.*
3. *Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:*
    a. *At least two (2) feet higher than the depth specified in feet on the community's Flood Insurance Rate Map; or*
    b. *At least three (3) feet if no depth number is specified; and*
    c. *Meet the requirements of section 14-450.8(h)1.b.*
4. *Zone A shall:*
    a. *Be elevated on a permanent foundation such that the lowest floor is at least two (2) feet above the base flood elevation utilizing information obtained*

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pursuant to section 14-450.6(b)4.a.ii; section 14-450.7(b)4; section 14-450.7(c)1; and

b. Meet the requirements of section 14-450.7(2)b. 5. Zones V1-30 and VE shall meet the requirements of article VI.P.

The proposed work does not include new or improved manufactured homes; this Standard does not apply.

(i) Recreational vehicles: Recreational vehicles located within:

1. Zones A1-30, AH and AE shall either:

a. Be on the site for fewer than one hundred eighty (180) consecutive days;

b. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only be quick disconnect type utilities and security devices, and has no permanently attached additions; or

c. Be permitted in accordance with the elevation and anchoring requirements for "manufactured homes" in section 14-450.8(h)1a and b.

2. Zones V1-30 and VE shall meet the requirements of either section 14-450.8(i)1.a. or b. or section 14-450.8(p).

The proposed work does not include recreational vehicles; this Standard does not apply.

(j) Accessory structures: Accessory structures located within Zones A1-30, AE, AO, AH and A, shall be exempt from the elevation criteria required in section 14-450.8(f) and (g) above, if all other requirements of section 14-450.8 and all the following requirements are met. Accessory structures shall:

1. Be five hundred (500) square feet or less and have a value less than three thousand dollars ($3,000.00);

2. Have unfinished interiors and not be used for human habitation;

3. Have hydraulic openings, as specified in section 14-450.8(l), in at least two (2) different walls of the accessory structure;

4. Be located outside the floodway;

5. When possible be constructed and placed on the building site so as to offer the minimum resistance to the flow of flood waters and be placed further from the source of flooding than is the primary structure; and

6. Have only ground fault interrupt electrical outlets. The electric service disconnect shall be located above the base flood elevation and when possible outside the special flood hazard area.

The proposed work does not include accessory structures; this Standard does not apply.

(k) Floodways:

1. In Zones A1-30 and AE, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted in ravine areas, for which a regulatory floodway is designated on the community's Flood Insurance Rate Map or Flood Boundary and Floodway Map, unless a technical evaluation certified by a registered professional engineer is provided demonstrating that such encroachments will not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

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2. *In Zones A1-30 and AE riverine areas, for which no regulatory floodway is designated, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted in the floodway as determined in section 14-450.8(11)3. unless a technical evaluation certified by a registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing development and anticipated development:*
    a. *Will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community; and*
    b. *Is consistent with the technical criteria contained in chapter 5 entitled "Hydraulic Analyses," Flood Insurance Study — Guidelines and Specifications for Study Contractors, (FEMA 37/January 1995, as amended).*
3. *In Zones A1-30, AE, and A riverine areas for which no regulatory floodway is designated, the regulatory floodway is determined to be the channel of the river or other watercourse and the adjacent land areas to a distance of one-half (1/2) the width of the flood plain as measured from the normal high water mark to the upland limit of the flood plain. Encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted unless a technical evaluation certified by a registered professional engineer is provided meeting the requirements of section 14-450.8(k)2.a. and b.*

The proposed work will not result in an increase in flood levels within the community during the occurrence of base flood discharge.

(l) Enclosed areas below the lowest floor: New construction or substantial improvement of any structure in Zones A1-30, AE, AO, AH and A that meets the development standards of article VI, including the elevation requirements of section 14-450.8, paragraphs (f), (g) or (h) and is elevated on posts, columns, piers, piles, "stilts," or crawl spaces may be enclosed below the base flood elevation requirements provided all the following criteria are met or exceeded:

1. *Enclosed areas are not basements;*
2. *Enclosed areas shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood water. Designs for meeting this requirement must either:*
    a. *Be engineered and certified by a registered professional engineer or architect; or*
    b. *Meet or exceed the following minimum criteria:*
        i. *A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of the enclosed area;*
        ii. *The bottom of all openings shall be no higher than one (1) foot above the lowest grade; and*
        iii. *Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the entry and exit of flood waters automatically without any external influence or control such as human intervention, including the use of electrical and other non-automatic mechanical means;*
3. *The enclosed area shall not be used for human habitation; and*
4. *The enclosed areas are usable solely for building access, parking vehicles, or storing of articles and equipment used for maintenance of the building.*

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The proposed building does not include enclosed areas below the lowest floor; this Standard does not apply.

(m) *Bridges: New construction or substantial improvement of any bridge in Zones A1-30, AE, AO, AH, A, V1-30 and VE shall be designed such that:*

1. *When possible, the lowest horizontal member (excluding the pilings, or columns) is elevated to at least two (2) feet above the base flood elevation; and*
2. *A registered professional engineer shall certify that:*
    a. *The structural design and methods of construction shall meet the elevation requirements of this section and the floodway standards of section 14-450.8(k); and*
    b. *The foundation and superstructure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all structural components. Water loading values used shall be those associated with the base flood.*

The proposed work does not include new or improved bridges; this Standard does not apply.

(n) *Containment walls: New construction or substantial improvement of any containment wall located within:*

1. *Zones A1-30, AE, AH, V1-30 and VE shall:*
    a. *Have the containment wall elevated to at least two (2) feet above the base flood elevation;*
    b. *Have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and*
    c. *Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a flood hazard development permit, as required by section 14-450.6(b)d.4.*
2. *Zones AO and AH shall have adequate drainage paths around containment walls on slopes, to guide flood water away from the proposed walls.*
3. *Zone AO shall have the top of the containment wall elevated above the highest adjacent grade:*
    a. *At least two (2) feet higher than the depth specified in feet on the community's Flood Insurance Rate Map; or*
    b. *At least three (3) feet if no depth number is specified.*
4. *Zone A shall have the containment wall elevated to at least two (2) feet above the base flood elevation utilizing information obtained pursuant to section 14-450.6(b)4.a.ii.; section 14-450.7(a)4; or section 14-450.7(c)1.*

The proposed work does not include new construction or substantial improvement of any containment walls.

(o) *Wharves, piers and docks: New construction or substantial improvement of wharves, piers, and docks are permitted in Zones A, A1-30, AE, AO, AH, V1-30, and VE, in and over water and seaward of the mean high tide if the following requirements are met:*

1. *Wharves, piers, and docks shall comply with all applicable local, state and federal regulations; and*

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2. *Commercial wharves, piers, and docks involving fill shall adhere to the design and construction standards contained in the U.S. Army Corps of Engineers' Shore Protection Manual.*

The proposed work does not include any wharves, piers, or docks; this Standard does not apply.

(p) *Coastal flood plains:*

1. *All new construction located within Zones A1-30, AE, A, V1-30 and VE shall comply with all applicable local, state and federal regulations.*

   The proposed work will comply with all applicable local, state and federal regulations.

2. *New construction or substantial improvement of any structure located within Zones V1-30 or VE shall:*
   a. *Be elevated on posts or columns such that:*
      i. *The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to two (2) feet above the base flood elevation;*
      ii. *The pile or column foundation and the elevated portion of the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components; and*
      iii. *Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable state and local building standards.*
   b. *Have the space below the lowest floor:*
      i. *Free of obstructions; or*
      ii. *Constructed with open wood lattice-work, or insect screening intended to collapse under wind and water without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting piles or columns; or*
      iii. *Constructed with nonsupporting breakaway walls which have a design safe loading resistance of not less than ten (10) or more than twenty (20) pounds per square foot.*

   The proposed work is not located within Zones V1-30 or VE; this Standard does not apply.

3. *A registered professional engineer or architect shall:*
   a. *Develop or review the structural design, specifications, and plans for the construction, which must meet or exceed the technical criteria contained in the Coastal Construction Manual, (FEMA-55/February, 1986); and*
   b. *Certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the criteria of section 14-450.8(p)2.*

   The proposed work will be designed by a registered professional structural engineer from Thornton Tomasetti. The Contractor has not been selected at this time, but the

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design specifications will require that construction methods are in accordance with accepted standards of practice.

4. *The use of fill for structural support in Zones V1-30 and VE is prohibited.*

   The proposed work is not located within Zones V1-30 or VE.

5. *Human alteration of sand dunes within Zones V1-30 and VE is prohibited unless it can be demonstrated that such alterations will not increase potential flood damage.*

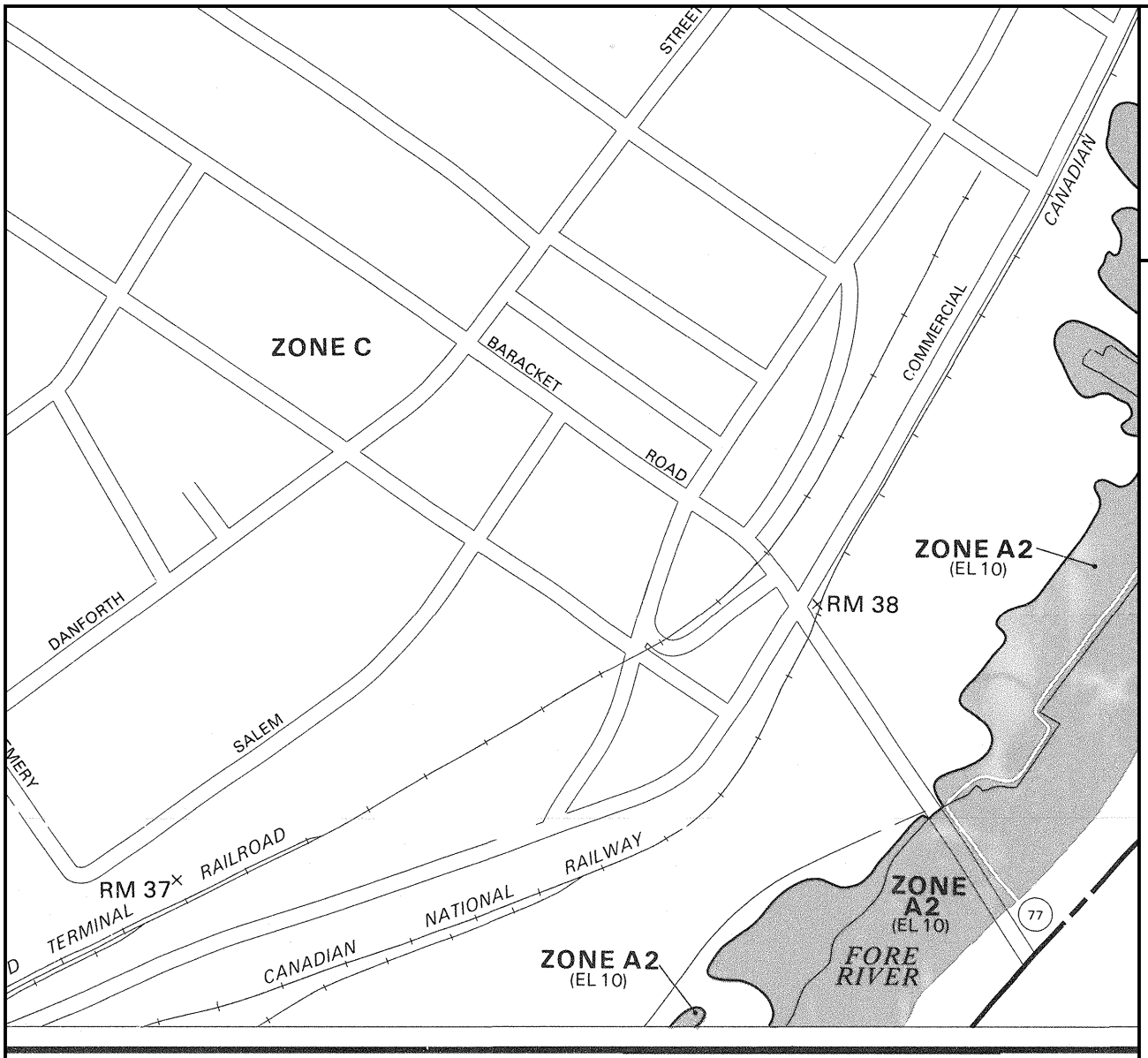
   The proposed work is not located within Zones V1-30 or VE; this Standard does not apply.

6. *The enclosed areas may be used solely for parking vehicles, building access, and storage.*

   The proposed work does not include any enclosed areas within the applicable zones; this Standard does not apply.

7. *Lobster sheds and fishing sheds located seaward of mean high tide shall be exempt from the elevation requirement in section 14-450.8(g) only upon review and approval by the planning authority or Planning Board and if all the following requirements of section 14-450.8(a), (k) and (l) are met:*
   a. *The conditional use shall be limited to low value structures such as metal or wood sheds two hundred (200) square feet or less and shall not exceed more than one (1) story.*
   b. *The structure shall be securely anchored to the wharf or pier to resist flotation, collapse and lateral movement due to the effect of wind and water loads acting simultaneously on all building components.*
   c. *The structure will not adversely increase wave or debris impact forces affecting nearby buildings.*
   d. *The structure shall have unfinished interiors and shall not be used for human habitation.*
   e. *Any mechanical, utility equipment and fuel storage tanks must be anchored and either elevated or floodproofed to two (2) feet above the base flood elevation. All electrical outlets shall be ground fault interrupt type. The electrical service disconnect shall be located on shore above the base flood elevation and when possible outside the special flood hazard area. All electrical outlets shall be ground fault interrupt type. The electrical service disconnect shall be located on shore above the base flood elevation and when possible outside the special flood hazard area.*

   The proposed work does not include any lobster sheds or fishing sheds; this Standard does not apply.



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

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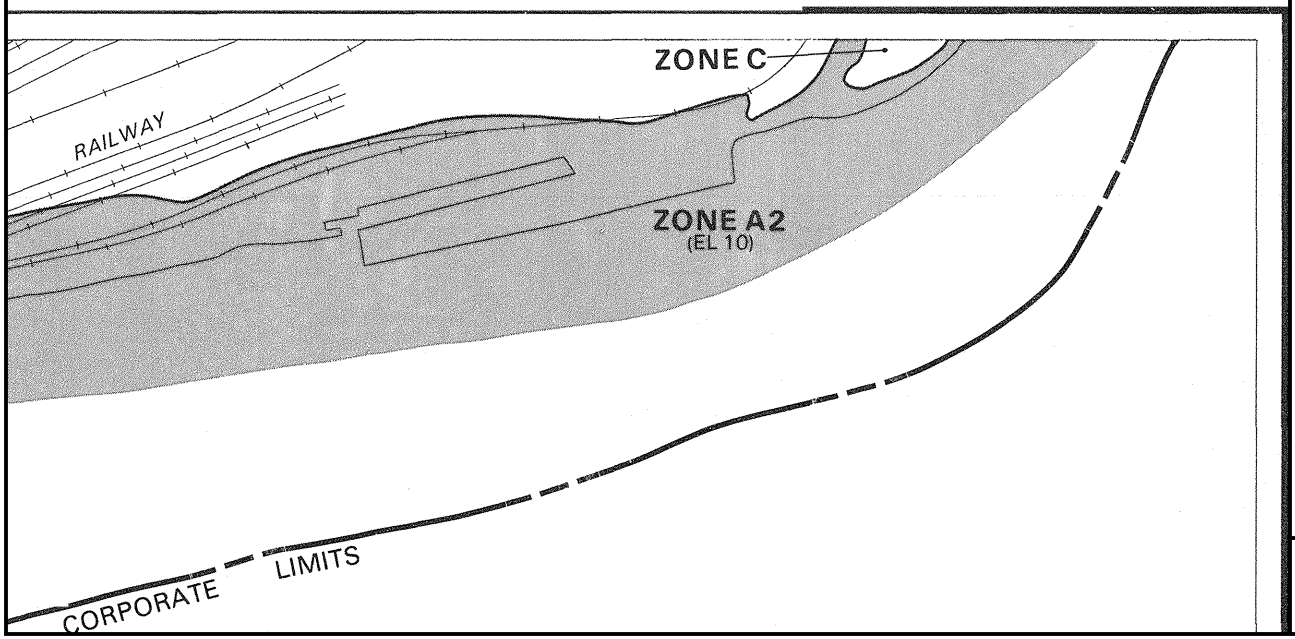

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 16 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0016 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

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Att. T

Via Electronic Mail

August 4, 2020

Christian Roadman, Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: Cold Storage Level III Site Plan Submittal – Maine International Cold Storage Facility, LLC
Response to Planning Staff Comments

Dear Christian:

Thank you for coordinating the review of the proposed Maine International Cold Storage Facility located at 40 West Commercial Street in Portland, Maine. To support the Level III Site Plan process, we are providing the following, additional responses to comments we have received from the City:

The following letter compiles responses to comments received from the City, including the following:

- Email correspondence from Ann Machado, Zoning Administrator, dated June 10, 2020;
- Email correspondence from Mike Tremblay, Senior Engineer, dated May 28, 2020;
- Memo from Michael Guethle, Lead Project Engineer (Wright-Pierce), dated May 20, 2020;
- Email from Jason Grant, Life Safety CEO/Plan Reviewer, dated June 1, 2020;
- Memo from Caitlin Cameron, Urban Designer, dated May 22, 2020; and
- Email from Christian Roadman, Planner, dated July 29, 2020.

Comments from the City

The additional comments received-to-date are provided below for your reference and our response follows each comment in italics:

Email from Ann Machado, Zoning Administrator, dated June 10, 2020

- *A Cold Storage Facility is listed as a Conditional Use in section 14-319. Do they also have a Conditional Use Application to go before the Planning Board? I'm not seeing a Conditional Use Application in Energov.*
    - Response: A Conditional Use application has been made. It is CU-001146-2020.
- *Have they provided information to show what the average grade is to determine the height? I still don't see any calculation for how they have determined average grade. They need to clearly indicate the average grade on the elevations because it is close.*
    - Response: Additional information was provided in the Response to Comments Letter dated May 15, 2020. That information is repeated below for reference. There is also a figure uploaded to Eplan "8.Cold Storage Height Fig.pdf" that accompanies this information. The building renderings now show an average existing grade line.

      Text from May 15, 2020 Response to Comments:

- *Please see the attached graphic illustrating the average grades used for the building height calculation.*
- *The average existing grade, taken at the proposed building corners, is 12.65 feet. The maximum building parapet height above 12.65 feet is 73'-10".*
- *The solar panels that will be mounted on the roof will be within 6-8 inches of the roof plain, and below the parapet.*
- *The solar inverters mounted on the rooftop will be installed such that the highest obstruction will be at or below 75'-0".*

- *Under section 14-320.2(b) (1)(b) they are required to have a determination from the FAA that structures and equipment will not exceed, the applicable height guidelines for the runway approach etc. Also have they provided the view corridor of 90 feet for the lot? Have both of these been verified?*
  - Response: A "Notice of Proposed Construction or Alteration" (FAA Form 7460-1) will be submitted to the FAA as required by Section 77.9 of the Federal Code of Regulations. The 90-foot view corridor is indicated on the site plans.

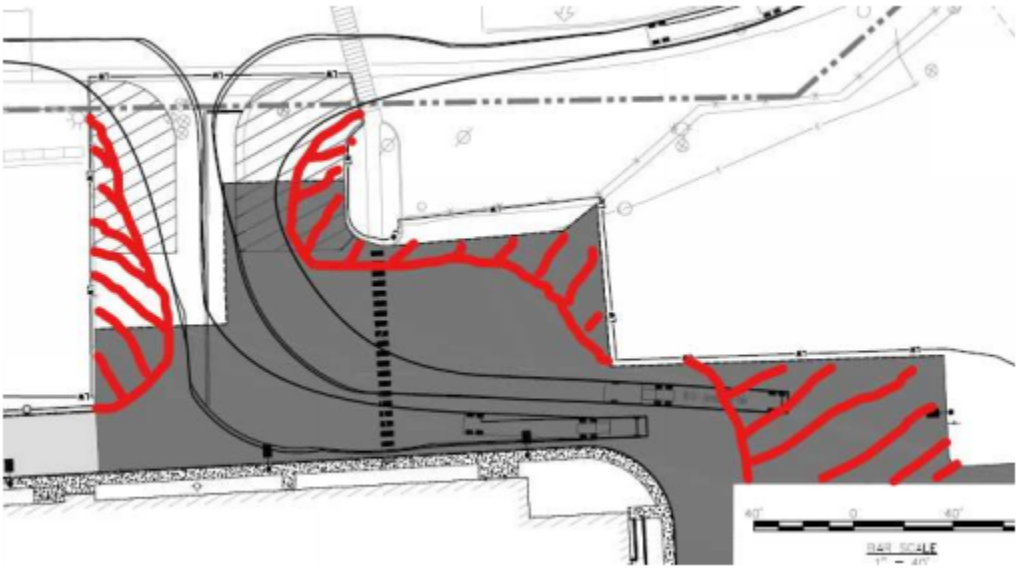
- *Flood Plain. Looking at Plan C-100, part of the building is within the Flood Zone A2 (EL 10) as is the access road. Since the building is in the flood zone, besides the Flood Hazard Development Application, they will need to provide a Flood Hazard Development Permit for New Construction which is a two part application and requires either an elevation certificate or flood proofing certificate. This can be provided when the building permit is applied for. Under section 14-450.8(g) new nonresidential construction in a A2 zone the lowest floor needs to be elevated above the base flood elevation of 10 feet and or be floodproofed to at least two feet above base flood elevation. The flood zone is not shown on version 2 of Plan C-100.*
  - Response: A Flood Hazard Development Permit has been applied for – a copy has been uploaded to Eplan as document "2020.05.18 Cold Storage Flood Hazard Development Application.pdf". The lowest floor level of the facility will be elevation 14.0, which is more than 2 feet above the BFE of 10.0. An elevation or flood proofing certificate will be provided at the time of building permit application.

Email from Mike Tremblay, Senior Engineer, dated May 28, 2020

- *The site continues to propose a very wide driveway width of about 104 feet. Wide driveways present a safety hazard, especially for bicycle traffic on West Commercial Street eastbound and any pedestrian traffic on the south side of West Commercial Street, as it allows all vehicles to make turns at higher speeds. The driveway width also adds additional impervious surface to the site, which already has a great deal of impervious surface. The entirety of this width, at the edge of the ROW, is justified if it is required that entering and exiting vehicles must be able to maneuver simultaneously. This driveway width could be reduced significantly if truck volumes are low enough that a conflict would be rare, and traffic would be able to yield to one another. In this case, a truck would be able to cross the centerline in the driveway in order to make a maneuver into/out of a narrower driveway opening without much conflict. The applicant should provide estimates of the number of trucks that will be entering and exiting the site during peak hours and over the course of a given day.*
  - Response: We have made some additional notations and changes to the site plan that further justify maintaining the existing width of driveway entrance.

- There is an existing gate into the rail loading platform that needs to be maintained. The gate location has been labelled on the site plan for clarity.
- A guard shack has been added to the site plan to control access into the truck yard. This has increased the usage of the existing impervious area to the NE of the building.

- *According to the turning templates, there are areas of proposed pavement that are not needed for any turning movements. The applicant should clarify the purpose of these areas and why they must be hardscaped. Any planned use of these areas should be documented in the site plan. A sketch of the areas of question is included at the bottom of this email.*



  - Response: See response to previous comment.

- *A waiver of Technical Manual Section 1.14 for parking space dimensions and drive aisle width is required for the truck parking area. The Applicant has justified the space dimensions and drive aisle width for this area. This waiver is supported by DPW after review of turning templates.*
  - Response: A waiver request for the truck parking space and drive aisle dimensions is attached.

- *The Applicant notes that the rear access road is required for fire access. A brief discussion with Life Safety indicated that this access road would be beneficial, but not required, in the case of an emergency. This should be confirmed with Life Safety. If this road is not required, DPW recommends that it be removed to reduce the impervious area on-site.*
  - Response: The fire access driveway was removed from the plans to reduce the impervious area.

- *The city requires a robust stormwater maintenance agreement with the Applicant. The City will not maintain the development's equipment in any way, and this equipment is essential to ensuring that pollutants from the facility and parking lots do not enter Casco Bay untreated/undertreated.*
  - Response: Noted and agreed.

- *The City will require an approved dewatering plan before issuance of a building permit, as the site is a VRAP site and any groundwater encountered may be contaminated and should not enter the City's stormwater system or Casco Bay untreated. DPW understands that the Applicant does not expect to encounter groundwater; however, given the possible presence of contaminants in the groundwater, a more robust dewatering plan is required.*
    - Response: Based on previous environmental assessments, it is likely that groundwater will be encountered during construction activities. The selected contractor will submit a dewatering plan, prepared, signed, and sealed by a qualified designer registered in Maine. The system will be designed to prevent groundwater that may be contaminated from entering the City's stormwater system or Casco Bay untreated. Construction dewatering is also covered in the Environmental Materials Management Plan (EMMP). The EMMP will be part of the construction documents and will also be reviewed and approved by the DEP.
- *All construction related deliveries should access the site from 295 via the Veterans Bridge/West Commercial Street or Franklin Street/Commercial Street. This should be noted in the CM plan.*
    - Response: The CMP Plan has revised to note that all deliveries will access the site from I-295 from the Veterans Bridge/West Commercial Street or Franklin Blvd/West Commercial Street.
- *An updated CM plan should include an adjusted construction schedule.*
    - Response: The CM Plan has been updated with an adjusted construction schedule.

Memo from Michael Guethle, Lead Project Engineer (Wright-Pierce), dated May 20, 2020

As site design has advanced since our previous submission on May 18, 2020, several changes have been made to the site that impact the stormwater management design, including modifications to the limit of work and redevelopment area, changes to impervious area from removal of the fire access drive; regrading associated with removal of the fire access drive; reconfiguration of the subsurface R-Tank storage system and treatment device; and modifications to the storm drainage pipe network. The attached Stormwater Management Report Revisions Letter includes a more detailed summary of these revisions and updated water quality calculations.

Basic Standard

Erosion and Sedimentation Control best practices were observed on the updated Grading, Drainage, and Erosion Control Plan and associated Details. An Inspection, Maintenance, and Housekeeping Plan has been provided with the erosion details and notes. No further action necessary.

- Response: Noted.

General Standard

- *The applicant has provided an impact analysis to compare pre-development and post-development land use pollutant rankings under MaineDEP redevelopment guidelines. The written analysis indicated that the site revisions did not change the general standard application; the proposed development has pollutant ranking between 0 and 1 greater than the existing site, and is therefore required to treat 60% of the proposed site's disturbed surface area. An updated summary of pollutant rankings was provided and reviewed, and the proposed pollutant rankings are agreed to. No further action necessary.*

- Response: Noted.

- *High-pollutant surface areas should be prioritized for stormwater treatment under the redevelopment standard. The revised stormwater treatment system provides treatment for 85% of the redeveloped area, including all of the areas with pollutant ranking 4 (excepting some fire access road, which is anticipated to carry less pollution than regular roadways). While redevelopment calculations state 61% of the site redeveloped area is receiving runoff treatment, it is apparent the 85% value mentioned in the cover letter is correct. No further action necessary.*
    - To clarify, the proposed stormwater management system will intercept and direct runoff from 86% of the site to the R-Tank storage system, which has been sized to detain a water quality volume equal to one-inch of rainfall over 61% of the redevelopment area.
- *An executed maintenance contract for the BMP systems is required. Maintenance agreements may be provided as a condition of approval.*
    - Response: Noted.

R-Tank and Jellyfish Filter

- *A letter from the manufacturer(s) stating the proposed project was designed in accordance with the MaineDEP standards has been provided.*
    - Response: Due to reconfiguration of the upgradient R-Tank detention system, we have reached back out to Contech for review and approval of the revised design. We will submit their updated design review letter upon receipt.
- *Site grading proposes no access of flood waters to catch basins in the identified 100-year flood elevation, no further action necessary.*
    - Response: Noted.
- *R-Tank is designed with consistent elevations in HydroCAD, Site Plans, and Details. Design has been updated to confirm layout of R-Tank unit, no further action necessary.*
    - The R-Tank detention system was moved and reconfigured east of its previous location to avoid exceeding maximum cover over the R-Tank modules. Revised design details are included in the design drawings uploaded to Eplan, and the revised HydroCAD model is included as an attachment to the Stormwater Management Report Revisions Letter, submitted separately.
- *R-Tank location has been relocated to an emergency entrance. The applicant has indicated the anticipated loading has been coordinated with the manufacturer, and the provided products were selected based on anticipated loading.*
    - Response: Noted.
- *A note indicating a valve at the stormwater outlet has been updated to confirm additional product information, no further action necessary.*
    - Response: Noted.
- *Treatment filter system has been modified to a StormFilter device. The updated design, as well as inspection and maintenance requirements for the StormFilter and R-Tank system, have been provided. We agree the StormFilter provides treatment for 60% of the redeveloped area; provides a water quality volume prioritizing treatment for impervious surfaces; and provides maintenance requirements in accordance with the manufacturer, and MaineDEP. No further action necessary.*

- Response: Noted.

Flooding Standard

- *The applicant has requested a waiver to the flooding standard, on the basis that the project conveys flows to a tidally influenced waterbody. The basis of this waiver has been reviewed with the updated site plan modifications, and is justified and supported by the reviewer.*
  - Response: Noted.

Grading and Drainage

- *Typical details, indicating a maximum 2% cross-slope for crosswalks have been provided. No further action necessary.*
  - Response: Noted.

Utility Connections

- *Ability to serve letters have not been provided for utilities impacted by the proposed project, but have been requested by the applicant for applicable utilities. The applicant has indicated that ability to serve letters will be submitted to Planning upon receipt.*
  - Response: We are working with PWD on ability to serve and will provide their response as soon as it is received.
- *Planting impacts to utilities: Several plantings are located over underground utilities near the transformer and generator pad. It is appreciated that these areas require screening. Applicant has confirmed the proposed plantings include shallow root systems and have been programmed to avoid underground utilities in the adjacent area. No further action necessary.*
  - Response: Noted.

Email from Jason Grant, Life Safety CEO/Plan Reviewer, dated June 1, 2020

- *The hydrant location looks good, For the solar panels I think that it's enough info for it to be approved at this point. It is hard to tell for sure that they are meeting all of the codes with this limited information but it appears they are putting in the required pathway so we can review the rest at the building permit phase. So Fire approves the changes.*
  - Response: Noted.

Memo from Caitlin Cameron, Urban Designer, dated May 22, 2020

Sec. 14-320.3 Performance Standards

(k) Lighting - Applicant has provided a photometric plan, cut sheets, analysis. Minimal amount of building lighting is provided that would be visible from the residential neighborhoods. All fixtures appear to be full cut off, and mounted low on the building or under canopies so as not to produce glare for vessels or neighboring residential properties.

- Response: Noted.

(l) Signs - Signs will come under separate permit application according to Sign Ordinance in Division 22.

- Response: Noted.

(o) Design and Visual Character:

1) Long Views/Building Design: Change in roof form provides some visual interest to meet the standard. Rooftop mechanicals are placed on a lower portion of the building to reduce visibility from long views and are screened. PV panels and roof drainage systems have low profiles. Massing variation provides some variation and smaller scale to the overall form.

- Response: Noted.

2) Massing: Massing emphasizes administrative uses with a smaller-scale, one-story portion of the building at the ROW interface that indicates the active portions of the building and street-facing entrances. A second change in massing occurs at the loading dock.

- Response: Noted.

3) Facades - equal treatment: All facades include equal treatment of materials and openings. The roof form is somewhat varied. Materials are placed according to function and massing and break up the scale of the building from some perspectives. For functional reasons, two of the facades have no massing or material variation with minimal openings and no articulation other than stoops at the entrances. To address the design requirements, the applicant proposes a color change related to the massing change to visually break up the facades. Staff support this approach in lieu of the ability to provide openings or massing variation.

- Response: Noted.

4) Facades - variation and articulation: Project provides some visual interest with varied roof line and massing, change in material texture, windows, canopies, roof drains. Two of the facades have no massing or material variation with minimal openings and no articulation other than stoops at the entrances, roof drains - a color change is proposed to address the standard. Staff suggest the proposed colors might be darker to be more recessive or else have greater contrast between the two to emphasize the visual break. A brighter, more dynamic color is another direction if visual interest is a priority.

- Response: We will continue to look into alternative colors however, the usable standard color selections are somewhat limited. Selecting darker colors will increase heat load on the exterior wall assembly hindering interior environmental performance. The industry standard and manufacturer's recommendation is to use "white" for the best performance. The current design is a minor deviation from this recommendation for the lower portion of wall and white for the upper portion.

5) Scale and Articulation: Project meets articulation requirement with canopy, entrances, and fenestration. The building also includes massing variation/stepbacks at the street-facing facade.

- Response: Noted.

Email from Christian Roadman, Planner, dated July 29, 2020

- *A zoning item regarding your cold storage problem came up, and I've attached two items related to the issue: a set of elevations and a page from the dimensional requirements section of the WPDZ.*

  The height requirements make a fairly specific point about the maximum height being inclusive of rooftop appurtenances / mechanicals. The length requirements tie length to building height (300ft max for portions over the regularly required height).

Because of the interplay mentioned above, I'm concerned that the North / South building elevations are problematic. There is exposed piping / equipment that is outside the 300 foot-length area. I believe the architect specifically called out this exposure as a design choice, celebrating the use of the building and making sure the form isn't just a box. I actually appreciate that a lot, but I'm afraid it may not meet the letter of the zoning ordinance here.

Also, just a reminder to please add average grade to the building elevations.

- Response: The average existing grade lines have been added to the building elevations.

  In addition, we have modified the piping appurtenances on the lower (60-foot limited height) roof so that it enters the freezer-cooler warehouse wall below 60 feet. In summary, we have one 300-foot building portion that falls within the 75-foot conditional use height, and the remainder of the building (and appurtenances) will be below the 60-foot permitted use roof height.

If you have any questions or require additional information, please do not hesitate to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

Woodard & Curran, Inc.



Darrin B. Stairs, PE
Project Manager

Enclosures: Following Attachments Uploaded Separately:

Revised Civil, Architectural and Landscaping Design Plans
Revised Architectural Renderings
Revised Site Lighting Report, Photometric Plans and Site Lighting Plan
Revised Construction Management Plan
Stormwater Management Report Revisions Letter and Attachments
Waiver Table

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May 15, 2020

Christian Roadman, Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: Cold Storage Level III Site Plan Submittal – Maine International Cold Storage Facility, LLC
Response to Planning Staff Comments

Dear Christian:

Thank you for coordinating the review of the proposed Maine International Cold Storage Facility located at 40 West Commercial Street in Portland, Maine. To support the Level III Site Plan process, we are providing the following responses to comments we have received from the City:

Preliminary Comments from City dated April 24, 2020

Zoning Comments

- *Cold storage facility is listed as a conditional use in the WPDZ zone. Staff reviewer is not aware of an existing conditional use application. This will be required for Planning Board review.*
    - Response: The Planning Office Manage was contacted and a Conditional Use Application has added to the workflow in the CSS.
- *Please update zoning table to acknowledge minimum lot size of 5 acres (for conditional uses).*
    - Response: An updated zoning table is attached.
- *Per zoning, maximum building length for a conditional use is 300 feet for buildings or portions of buildings exceeding the maximum applicable height allowed under the permitted use. However, the application and site design assume a non-applicable maximum length of 450 feet.*
    - Response: The portion of the building exceeding the maximum applicable height allowed under the permitted use has been reduced to 300 feet. Please see the revised site plans uploaded to Eplan.
- *Please provide spot grades and/or graphic regarding average grades and your calculations of building height.*
    - Response:
        - Please see the attached graphic illustrating the average grades used for the building height calculation.
        - The average existing grade, taken at the proposed building corners, is 12.65 feet. The maximum building parapet height above 12.65 feet is 73'-10".
        - The solar panels that will be mounted on the roof will be within 6-8 inches of the roof plain, and below the parapet.
        - The solar inverters mounted on the rooftop will be installed such that the highest obstruction will be at or below 75'-0".
- *Please note the required 90-foot view corridor on the site plan or another appropriate plan.*
    - Response: The 90-foot view corridor has been added to the site plan.

- *Part of the building is within the Flood Zone A2 (EL 10), as is the access road. A Flood Hazard Development Permit for New Construction must be provided with the building permit application.*
    - Response: A Flood Hazard Development Permit for New Construction has been submitted under separate cover.
- *Please note that under Section 14-450.8 (g), for new nonresidential construction in an A2 zone, the lowest floor must be elevated above the base flood elevation of 10 feet and/or be flood-proofed to at least two feet above the base flood elevation.*
    - Response: The lowest floor, at 14.0 feet, is set more than two feet above the base flood elevation of 10 feet.

Overarching Comments

- *As noted below (transportation) impervious and paved surfaces should be minimized. Where reduction is not possible, please explore feasibility of permeable pavements. Staff understand a very large installation of this material exists elsewhere on the IMT lot, adjacent to this site.*
    - Response: The pavement limits shown on the plans represent what is needed for the facility to operate effectively and safely. The use of permeable pavements was considered, but discounted, due to maintenance requirements and concerns with the long-term durability in this particular application and in the Maine climate.
- *Expected timelines are requested regarding necessary state, federal, and utility approvals, especially:*
    - *FAA determination that "structures and equipment will not exceed the applicable height guidelines for the runway approach and will not create a hazard to navigable space".*
    - *PWD capacity to serve letter (please note DPW wastewater capacity letter has been received).*
    - Response: A Notice of Proposed Construction or Alteration (Form 74601) will be submitted to the FAA, and the response provided to City staff as soon as it is received. We are working with PWD on ability to serve and will provide their response as soon as it is received.
- *Please be prepared to provide an updated option to ground lease agreement if necessary, per timing of review and Planning Board scheduling.*
    - Noted.

Transportation Comments

- *Per the consulting traffic engineering reviewer, the applicant shall conduct a trip generation analysis for the entire IMT site over the last 10 years. The site does not have a Traffic Movement Permit and incremental development considerations may cumulatively trigger the need for a TMP. Based on prior applications, it is likely that a TMP will be required.*
    - Response: We are reviewing with the State Traffic Engineer to further understand whether this project is subject to incremental development considerations. A response to this comment will be submitted under separate cover.
- *There is no sidewalk proposed along the project frontage. A sidewalk waiver is required. The waiver requirements are outlined in Section 14-501 of the City Code. If a sidewalk is provided, then an acceptable, ADA-accessible driveway crossing must also be provided. If a sidewalk is not provided, a contribution (separate from required impact fees) will be sought for nearby sidewalk and/or path facilities.*

- Response: Please see the attached updated Waiver Table for the sidewalk waiver request.

- *The driveway opening onto West Commercial Street is much larger than the maximum permitted under the Technical Manual (30 feet). DPW understands that this facility will require right turns both into and out of the site by large vehicles, and has reviewed turning templates from a previous submission that justify the large driveway opening. The Applicant must apply for a driveway width waiver as part of their application.*
    - Response: Please see the attached updated Waiver Table for the driveway width waiver request.
- *Updated turning templates showing the design vehicle entering and exiting the site using the newest site plan should be submitted for DPW review. Please note, a turn template submitted with this application was reviewed. Regarding those runs:*
    - *Runs should show trucks entering and exiting the site to justify the width of the driveway and inform the locations of alternate pavement material (or hatch markings, as previously proposed). A vehicle existing the parking area to the driveway would also be helpful.*
    - *Runs should show that all proposed pavement is necessary.*
    - *Within the site, entering and exiting vehicles will yield to one another. The site design should not assume that two turning vehicles should be able to pass one another in opposite directions. Please provide design controls/assumptions about how vehicles interact within the site.*
    - *Entering the parking spaces, the run shown does clarify that the drive aisle width appears to be useful, but the model entering the space in a crooked manner does not appear to justify a 25-foot space width. An extra forward-backward maneuver can likely correct this angle.*
    - *The provided run does not show how a vehicle would enter and exit a space south of the deadhead area (the wider area where the truck maneuvers into before backing up. Please clarify how the spaces south of that which is backed into work; it appears as though each space becomes progressively more difficult moving southward.*
    - Response: Please see the attached truck turning movement figures.
- *While DPW understands that a wide driveway is required, efforts should be made to guide smaller vehicles entering the site and discourage fast turns, which can be unsafe, especially for pedestrians crossing the driveway or crossing West Commercial Street. The current site plan shows a hatched striping that limits the northbound direction of the driveway to 24 feet. DPW suggests that this treatment be extended, narrowing the drive lanes in each direction to 12 feet. The applicant should also consider using a more durable and tactile material than paint, such as scored concrete, as paint will wear out quickly and does not provide any feedback to motorists.*
    - Response: The proposed drive lanes have been limited to 12 feet with striping. The applicant wishes to continue using striping to delineate this area, to minimize cost and construction impacts to the intersection.
- *The 104-foot width of the end of the driveway, closest to the proposed structure, should be justified or reduced.*
    - Response: The extents of the pavement are required for the safe maneuvering of trucks into and out of this facility and the adjacent IMT yard.

- *The passenger parking area has 20-foot parking stall lengths. These stall lengths should be justified or reduced to 18 feet.*
    - Response: The parking stall lengths have been reduced to 18 feet.
- *The area on the northeast side of the site, where the crosswalk is shown to be re-striped, adds additional pavement south of existing pavement to remain. The applicant should specify the use of the existing-to-remain portions of the site with respect to the proposed project, and make efforts to reduce pavement area where possible. In this location, the crosswalk appears to cross a swath of existing and proposed pavement that is about 83 feet wide.*
    - Response: The extents of the pavement are required for the safe maneuvering of trucks into and out of this facility and the adjacent IMT yard.
- *The proposed site plan shows about 25 truck parking spaces, each measuring about 25x55, with a 91-foot drive aisle for a total pavement width of 201 feet. DPW does not have standards for truck parking such as this and would support a waiver for parking space and drive aisle size if they can be justified. While parking stall length appears appropriate at 55 feet, the stall width seems excessive, over 2.5x the size of a typical passenger vehicle stall. The drive aisle serves as a maneuvering area and extra width is justifiable, but the Applicant should provide justification (turning movements or otherwise) for the size of the drive aisle and stall width. Large vehicles access narrower loading docks in the urban areas of Portland with significantly less maneuvering space. Any reduction in these dimensions can help reduce the amount of impervious surface at this site, which would in turn reduce effects on stormwater, reduce snow removal burden, reduce heat island effects, and would likely reduce project costs significantly.*
    - Response: The truck parking space widths at the loading docks are 14 feet, as determined by the loading dock door spacing and as requested by the owner/operators of the facility. The truck parking spaces are 12 feet. These are standard dimensions and facilitate safe maneuvering into and out of the spaces. We will prepare a waiver request if required, but to our knowledge there are no truck parking requirements in the Ordinance. Please clarify to which section of the Ordinance the waiver should be requested.
- *A 24-foot access aisle provided around the back of the building appears to be a secure area leading to the IMT site east of the project site. This access aisle has entrances from both the passenger vehicle parking lot and the heavy vehicle parking lot; however, it does not appear that the access road is designed to accommodate heavy vehicles turning into or out of the access road. The access road also appears to be redundant behind the proposed cold storage facility; any vehicle entering at the western gate could presumably also do so at the eastern gate. The applicant notes its use for Fire Department vehicles, but eliminating this access road may eliminate 17,000+ SF of impervious surface and several drainage structures. The applicant should justify the need for this drive or examine potential reductions.*
    - Response: Please see the attached truck turning figures for fire truck access to the rear of the building. The gates will be equipped with a "knox" box to allow emergency access. The drive will also provide a secondary emergency access to the Unitil Facility to the east. We believe this road is required for fire department access to the rear portion of the building.
- *The project site includes two van-accessible parking spaces on the west side of the site, which adequately meet requirements based on site's passenger vehicle parking supply. Truck parking spaces need not figure into the ratio of required accessible parking spaces, per ADA. The accessible spaces should be designed to ADA standards (8' x 18' minimum, 8-foot buffer (for van spaces), maximum 2% slope in all directions within the buffer).*

- Response: The ADA spaces have been designed to the 8'x18' standard, with 8-foot access aisle and maximum 2% slopes. A detail has also been added to the plans.

- *The design of ADA ramps is not noted on the Grading and Drainage plans, nor is a detail provided. A curb ramp detail is requested for all ramp types on the site.*
  - Response: Standard details for the ADA ramps are included in the attached revised plans.
- *Bike hitches should be placed convenient to entrance(s) – currently they appear to be located based on the parking lot placement.*
  - Response: We have relocated the bike racks to be more proximate to the main entrance.
- *Snow storage areas appears to omit the access road – please clarify intentions if access road is proposed to remain.*
  - Response: Additional snow storage areas for the fire access road have been identified on the revised site plans.
- *Instead of requesting a waiver of the City requirement for a TDM plan, please submit a simple document adequately focused on and scaled to the unique aspects of this project.*
  - Response: We understand that a TDM plan is required for the following types of development:
    - All Level III development in the B7 Zone
    - All commercial or institutional uses of 50,000 SF or more of total floor area
    - All commercial or institutional uses designed to accommodate 100 or more employees

    While this project meets the second criteria (>50,000 sf or more of total floor area), most of the space is warehouse use. The total expected employee count is less than 25 employees, and we do not believe a TDM plan is necessary for this project in this location. We respectfully request reconsideration of the waiver request.

Water Quality, Stormwater, Infrastructure & Public Safety Comments

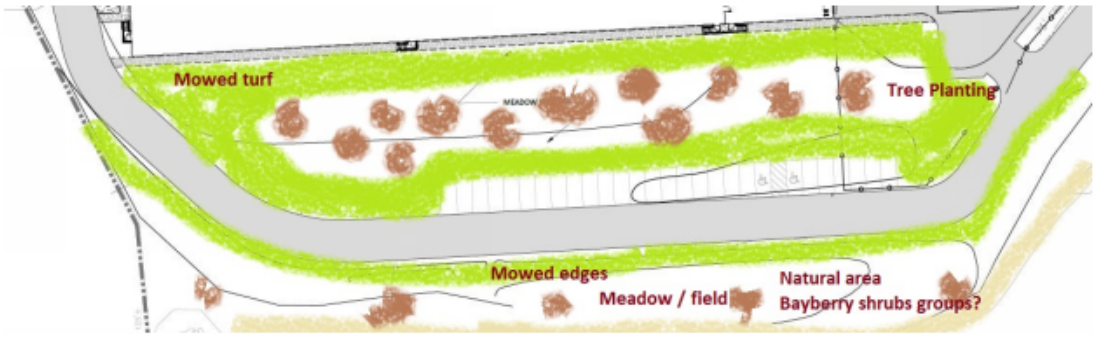
- *A third-party civil engineering review memo is attached. Please review and respond.*
  - Response: Please see responses to the third-party review memo below.
- *The large area of loam and seed south of the proposed structure and north of the access road appears to be unprogrammed space. The applicant should consider using this area for storage of stormwater and pretreatment prior to the R-tank, and/or using this area to plant trees to screen the blank south-facing wall from the waterfront.*
  - Response: This area may be used for future expansions of the building, and as such it is not desirable to encumber with landscaping and stormwater treatment structures. Plantings have been added to the river side of the access road, to help screen the building from the waterfront.
- *Please clarify if the site will be gated and/or relevant security protocols.*
  - Response: Only the access road to the rear of the building will be gated, and a "knox" box included for emergency access. The remainder of the site will not be gated.
- *An additional hydrant must be provided. Please see attached site plan markup indicating location.*

- Response: The additional hydrant has been added as requested. See attached revised utility plan.

- *Any photovoltaic arrays will need to meet the requirements of NFPA 1 Fire Code 2018 edition for roof coverage, and other applicable sections. Please submit a layout plan.*
  - Response: A PV layout has been provided as requested. The roof plan depicts access in two directions through the middle of the array layout as well as around the entire perimeter. This will allow both general PV service as well as allow safe fire fighter access and logical ventilation options should the need arise. Proper identification and electrical warning signage will be provided at all inverter and conduit run locations. Roof access has been provided within the building through a combination of roof access stairs and ladders. Walk pads define safe paths of travel on each roof area. It is the full intent to provide a layout that fully conforms with all applicable codes. It is expected that this layout would be further reviewed for final approval during the construction permitting process.
- *Please acknowledge presence of photovoltaic arrays on site plan and/or utility plan.*
  - Response: The Utility Plan has been updated to include the location of the PV array. Details of the array are shown on the Architectural plans.
- *Please specify procedures for trash storage and removal (staff acknowledge the compactor present on the site plan).*
  - Response: Trash will be staged inside the loading dock area if necessary, before loading into the compactor, or loaded into the compactor directly, depending on the quantity. A private, licensed, municipal waste hauler will be contracted for emptying of the dumpster regularly.

Environmental Quality Comments

- *(See image below).The City Arborist suggests a grove of trees on the water side of the proposed building to screen the facility from the bridge, South Portland and the harbor. If a mowed lawn around building and pavement edges is desired the grove of trees could be placed in the proposed meadow area. Tree types could be White Spruce, Serbian Spruce, River Birch, or Red Oak.*
  - Response: We have added trees on the outside of the perimeter driveway, along with shrub masses as requested in the comment below. This location will allow future expansion of the Cold Storage Building without removing/ replacing the proposed trees.
- *(See image below.) Yearly mowing should be considered to keep the proposed meadow area from growing into brush. Along the water edge, Bayberry shrubs in groups of 3, 5, 7 spaced out along the shoreline are suggested.*
  - Response: We have added planted groupings of bayberry shrubs along the outside of the perimeter driveway, in addition to groves of native trees, which will soften the building from the waterside. We anticipate the meadow will be mowed 1-2 times per year to keep brush and invasive plants from establishing.
- *Parking exceeds fifty spaces, which is a threshold per site plan requirements for 2+ trees (or 1 tree + 3 shrubs) per 5 spaces in landscaped islands.*
  - Response: There are 30 parking spaces for automobiles on the west side and parking for 12 trailers on the east side of the facility. At a rate of 2 trees / 5 spaces there would be a requirement of 12 trees on the plan. The Landscape Plan provides for 52 trees, which exceeds the landscape requirement.



Site Design Comments

- *A design review memo is attached. Please review and respond.*
    - Response: Please see responses to the third-party review memo below.

Initial Review Comments from Wright-Pierce from memo dated April 14, 2020

As site design has advanced since our previous submission on March 13, 2020, several changes have been made to the site that impact the stormwater management design, including modifications to the limit of work and redevelopment area, changes to impervious area from reconfiguration of sidewalks, concrete equipment pads and adjacent landscaping; relocation of the subsurface R-Tank storage system and treatment device; and modifications to the storm drainage pipe network. The attached Stormwater Management Report Revisions Letter includes a more detailed summary of these revisions and updated water quality calculations.

Basic Standard

- *Erosion and Sedimentation Control best practices were observed on the Erosion and Sediment Control Plan and associated Details. An Inspection, Maintenance, and Housekeeping Plan has been provided with the erosion details and notes. Catch basin inlet protection should include catch basin throat protection where applicable.*
    - Noted.

General Standard

- *The applicant has provided an impact analysis to compare pre-development and post-development land use pollutant rankings under MaineDEP redevelopment guidelines. The written analysis indicated that the proposed development had a lower pollutant ranking than the existing site and is therefore required to treat 60% of the proposed site's disturbed surface area. A summary of pollutant rankings was provided and reviewed, and the proposed pollutant rankings are agreed to.*
    - Response: As previously mentioned, pollutant impact rankings for the proposed and existing site were recalculated due to changes to the site and stormwater management system design. Based on the revised water quality calculations, the proposed project continues to be required to provide treatment for 60% of the redevelopment area.
- *High-pollutant surface areas should be prioritized for stormwater treatment under the redevelopment standard. The Applicant has provided a summary indicating that the majority of treated area is impervious. Please provide a discussion on how much of the surfaces with pollutant ranking 4 are receiving treatment, and a statement on site practicality requiring treatment of lesser-ranked surfaces.*

- Response: Higher pollutant ranking areas (Rank 4 and Rank 3) will be captured and treated in their entirety (medium use road, medium use parking and flat roof), with exception to a few segments of the fire access road, which is not anticipated to see much traffic. Approximately 85% of the redevelopment area will be captured and the proposed stormwater management system will treat a volume of stormwater greater than the required water quality volume.

- *An executed maintenance contract for the BMP systems is required. Maintenance agreements may be provided as a condition of approval.*
  - Noted.

R-Tank and Jellyfish Filter

- *A letter from the manufacturer(s) stating the proposed project was designed in accordance with the MaineDEP standards is required for proprietary treatment devices. Please provide this information.*
  - Response: A letter demonstrating that the design of the stormwater treatment system has been reviewed and approved by the manufacturer is attached.
- *Site grading proposes no access of flood waters to catch basins in the 100-year flood elevation, no further action necessary.*
  - Noted.
- *R-Tank is designed with consistent elevations in HydroCAD, Site Plans, and Details. Please provide the number of R-Tank modules (length by width) on the Grading, Drainage Plan, and Erosion Control Plan to confirm the proposed layout matches the plan. Module height has been provided.*
  - Response: Additional R-Tank information, including a module layout, is provided in the revised civil design plans.
- *R-Tank location appears to be within heavy truck area. Information on minimum depth of cover is proposed on the detail, but is not noted to meet loading criteria of the proposed trucks. Please provide information from the manufacturer indicating that the proposed system can sustain expected traffic loading.*
  - Response: The R-Tank Storage system was relocated south of the proposed building under the fire access road to reduce traffic and loading impacts. The fire access road will only see occasional maintenance traffic, or rare, emergency traffic. The R-Tank module type was selected per manufacturer recommendation based on proposed loading.
- *A note indicating a valve at the stormwater outlet was provided, but was not observed. Please provide a detail for the stormwater outlet restrictor, or confirm where the detail is located in the plan set.*
  - Response: The note was modified to include more specific information on the valve type.
- *Plans call for a 24" Jellyfish filter outlet, and the HyrdroCAD shows a 30" outlet. Please review.*
  - Response: The HydroCAD model is now consistent with the revised Grading & Drainage Plan.

Flooding Standard

- *The applicant has requested a waiver to the flooding standard, on the basis that the project conveys flows to a tidally influenced waterbody. The basis of this waiver is justified and supported by the reviewer.*
    - Noted.

Grading and Drainage

- *Applicant has noted that Maine Construction General Permit is required for the project due to the extent of grading.*
    - Noted.
- *Applicant has noted the Owner is a participant in the VRAP through the MaineDEP, and that soil management plans will need to be developed and approved through the MaineDEP.*
    - Noted.
- *Typical details, or a note on the grading plan, should show a maximum 2% cross-slope for crosswalks.*
    - Response: Notes have been added to the Grading and Drainage Plan.

Utility Connections

- *Ability to serve letters have not been provided for utilities impacted by the proposed project, but have been requested by the applicant for applicable utilities. The applicant has indicated that ability to serve letters will be submitted to Planning upon receipt.*
    - Response: We are working with PWD on ability to serve and will provide their response as soon as it is received.
- *Standard design for the water and fire system has been provided. Adherence to PWD standards is typically provided by the water utility for water connections, and would be addressed in an ability to serve letter and acceptance through PWD.*
    - Noted.
- *Standard design for the electrical and gas and electric utilities has been provided.*
    - Noted.
- *Planting impacts to utilities: Several plantings are located over underground utilities near the transformer and generator pad. It is appreciated that these areas require screening. Please confirm how the design incorporates mitigation or prevention for roots impacting underground utilities, while also providing required screening.*
    - Response: Proposed shrub and tree plantings in the vicinity of the transformer and generator have been selected to provide shallow root systems, and will be planted to avoid any underground utilities in the adjacent area.

Comments from Caitlin Cameron from memo dated April 2, 2020:

Lighting

- *Applicant has provided a photometric plan, cut sheets, analysis. Minimal amount of building lighting is provided that would be visible from the residential neighborhoods. All fixtures appear to be full cut off, and mounted low on the building or under canopies so as not to produce glare for vessels or neighboring residential properties.*
    - Response: Please see attached revised site lighting and photometric plans.

Signs

- *Signs will come under separate permit application according to Sign Ordinance in Division 22.*
    - Noted.

Design and Visual Character

- *Long Views/Building Design: Change in roof form provides some visual interest to meet the standard. Rooftop mechanicals are placed on a lower portion of the building to reduce visibility from long views and are screened. PV panels and roof drainage systems have low profiles. Massing variation provides some variation and scale to the overall form.*
    - Noted.
- *Massing: Massing emphasizes uses with a smaller-scale, one-story portion of the building at the ROW interface that indicates the active portions of the building and street-facing entrances.*
    - Noted.
- *Façades – equal treatment: All facades include equal treatment of materials and openings. The roof form is somewhat varied. Materials are placed according to massing and break up the scale of the building from some perspectives. Two of the façades have no massing or material variation with minimal openings and no articulation other than stoops at the entrances.*
    - Response: The southern and western elevations are two of the four main cooler partitions. Administrative support space and loading dock areas have been wrapped around the northern and eastern sides to assure proper functionality for site circulation as well as to address internal space layout demands. This in turn breaks up the form on the two most prominent building facades. Additional form development on the two reaming sides would either require the addition of unused space or require a height change within the cooler reducing the required number of pallet positions. Please refer to the following response for further comment and design intent.
- *Façades – variation and articulation: Project provides some visual interest with varied roof line and massing, change in material texture, windows, canopies, roof drains. Two of the façades have no massing or material variation with minimal openings and no articulation other than stoops at the entrances, roof drains.*
    - Response: The design intent is to break up these large portions of wall area by incorporating a horizontal panel break line that wraps around the south and west elevations. To better accent this change, a two-color panel concept is being proposed. This will break up the wall area, add interest to these two elevations and help tie the building together as the colors continue to wrap around the primary facades. The current building elevations and renderings reflect this revision.
- *Scale and Articulation: Project meets articulation requirement with canopy, entrances, and fenestration. The building also includes massing variation/stepbacks at the street-facing façade.*
    - Noted.

If you have any questions or require additional information, please do not hesitate to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

Enclosures:
Revised Civil, Architectural and Landscaping Design Plans (uploaded to Eplan)
Revised Architectural Renderings (uploaded to Eplan)
Revised Site Lighting Report, Photometric Plans and Site Lighting Plan
Stormwater Management Report Revisions Letter and Attachments
Updated Waiver Table
Updated Zoning Table
Flood Hazard Development Permit (submitted under separate cover)
Building Height Figure
Turning Movement Figures
IFWS Review Response Letter
Geotechnical Report

COMMITMENT & INTEGRITY
DRIVE RESULTS

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F 207.774.6635

Att. U

September 29, 2020

Christian Roadman
City of Portland Planner
389 Congress Street
Portland, ME 04101

Re: Maine International Cold Storage Facility | 40 West Commercial Street
Supplemental and Updated Application Materials

Dear Christian:

Thank you for your continued efforts reviewing the application materials for the proposed Maine International Cold Storage Facility to be located at 40 West Commercial Street. This letter compiles supplemental application materials to be entered into the record in advance of the Planning Board Public Hearing scheduled for October 13, 2020. The additional materials are detailed below.

1. **Supplemental Application Materials (uploaded to Eplan)**

   - *Conditional Use Memorandum*, dated September 22, 2020. This memo addresses two specific Criteria raised by Planning Board members at the September 8, 2020 workshop: (1) Conditional Use Standard "allow for adequate access to the water"; and (2) the dimensional requirement for the "view corridor".
   - *Conditional Use Criteria,* dated September 28, 2020. This letter reviews the applicable Conditional Use Criteria from Sections 14-320 and 14-474 of the Land Use Ordinace.

2. **Updated Application Materials (uploaded to Eplan)**

   - *C-100 Site Plan Layout Plan,* updated September 29, 2020. To further reduce impervious areas, the site plan has been revised to remove six (6) employee parking spaces; three (3) truck parking spaces; and another small area of pavement in the truck yard.
   - *L1.0 Landscape Plan, updated September 29, 2020.* To address concerns with the views from the river (south) side of the building, twenty-one (21) additional trees have added for a total of thirty-nine (39).

If you have any questions or require additional information, please do not hesitate to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

cc: Eric Carlson, Jedd Steinglass - Woodard & Curran, Inc.
Matthew Dieterich - Treadwell Franklin Infrastructure Capital

Enclosures: *MICSF Conditional Use Memorandum*, dated September 22, 2020
Conditional Use Criteria, dated September 28, 2020.
C-100 Site Plan Layout Plan, updated September 29, 2020
L1.0 Landscape Plan, updated September 29, 2020

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DRAFT MEMORANDUM

TO: Christian Roadman, City of Portland

CC: Christine Grimando, City of Portland
James Rather, City of Portland

FROM: Darrin Stairs
Jedd Steinglass

DATE: September 22, 2020

RE: Maine International Cold Storage Facility (MICSF)
Conditional Use and Dimensional Considerations

This memo has been prepared following the Planning Board workshop held on September 8, 2020, during which Planning Board members raised questions concerning the compatibility of the current MICSF design and use with certain requirements of City of Portland Code of Ordinances Chapter 14, Division 18.5: Waterfront Port Development Zone. The two questions highlighted during this workshop pertain to:

1. Conditional use standard "allow for adequate access to the water;" and

2. Dimensional requirement "For each lot, at least one view corridor of at least ninety (90) feet in width shall be left unbuilt to preserve a clear line of sight between West Commercial Street and the water."

A discussion of the proposed MICSF design and use relative to these sections of Division 18.5 follows.

Allow for Adequate Access to The Water

Our understanding of the intent of this section of the Ordinance is to protect from adverse impact whereby a development project could prohibit access to the water. An example of such adverse impact would be the construction of a single large building or a series of buildings that would span laterally from property line to property line and cut off the possibility of transit between West Commercial Street and the Fore River.

We are not aware that this Ordinance requires a project to actively provide access to the water as part of its development plan.

Consistent with the dimensions and orientation of the MICSF building, there is adequate opportunity to create access to the water on either the east or west sides of the building, if such access were determined to be necessary to support the operation of the facility in the future. In addition, the building setback from the edge of the Fore River allows for future development of berthing and access to potential berthing should it be needed in the future. Therefore, the current design allows for adequate access to the water, in accordance with our understanding of the intent of the Ordinance.

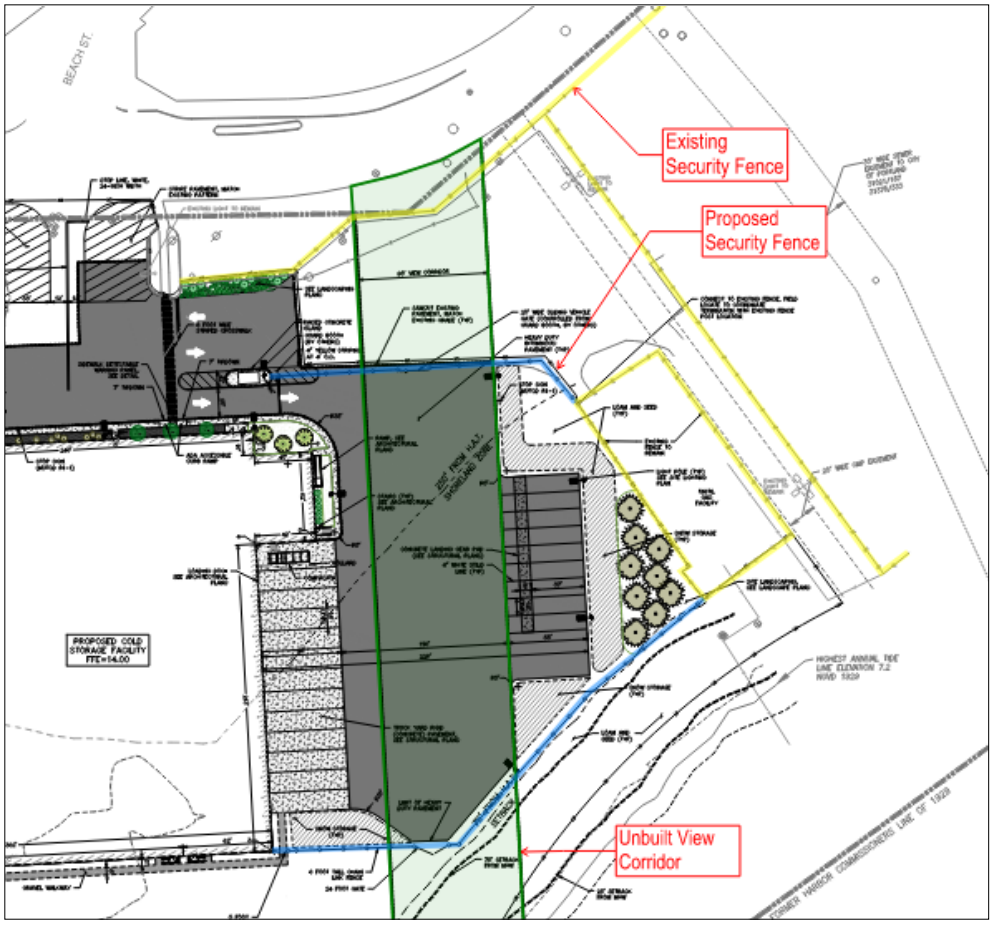
In addition, the proposed MICSF is an important component of the International Marine Terminal (IMT). Bulk cargo bulkheads and loading facilities that provide access to the water for freight operations are available at the adjacent IMT. As proposed, the IMT will be connected to the MICSF via an internal driveway such that container freight may readily pass from the MICSF to the IMT and vice versa. Therefore, though no bulkheads or water access are necessary or are planned to support the operation of the MICSF, it may functionally utilize the existing water access provided by the IMT.

Unbuilt View Corridor

It is our understanding that the intent of this dimensional requirement is to prevent the construction of buildings that would eliminate views of the Fore River from West Commercial Street and the areas beyond. Like the scenario noted above, we believe this requirement was included to prevent the construction of a single large building or a series of buildings that would span laterally from property line to property line and eliminate the possibility of viewing the Fore River from West Commercial Street.

The current MICSF design drawings present one 90-foot view corridor as an unbuilt area located east of the proposed building. Therefore, no buildings proposed as part of this project will impede of this view corridor and we feel that the efforts made during building design and site layout fulfill the intent of the Ordinance. It is relevant to note that much greater than 90 feet of unbuilt land exist east of the proposed facility, though the drawings have been presented to show only the 90-foot dimension to demonstrate that the requirement has been met.

During the September 8, 2020 Planning Board Workshop, there was some discussion of the characteristics of the existing security fence that spans the length of the MICSF property along West Commercial Street, east of Beach Street (see snip below). Planning Board members noted that the existing security fence configuration was permeable and allowed pedestrians to view beyond the fence line. We do not feel that fencing, light poles, landscaping, or similar features that are integral or contribute to the function of the project qualify as buildings or built features. Though additional security fencing will be necessary within the interior of the MICSF site, the development team plans to use similar permeable materials such that views beyond the interior fence line will not be prohibited.



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September 28, 2020

Christian Roadman
City of Portland Planner
389 Congress Street
Portland, ME 04101

Re: Maine International Cold Storage Facility | 40 West Commercial Street
Conditional Use Criteria

Dear Christian:

On behalf of Maine International Cold Storage Facility (MICSF) LLC, Woodard & Curran (W&C) is submitting this memo to address Conditional Use Criteria relevant to the project. This is supplemental to materials previously submitted for the Level III Site Plan Application No. PL-001042-2020, and Conditional Use Application No. CU-001146-2020.

The primary proposed use, cold storage facility, is considered a Conditional Use, per **Section 14-319-Permitted Uses** of the City of Portland's Chapter 14, Land Use Code of Ordinances.

Per **Sec. 14-320. Conditional use standards,** Conditional uses shall be permitted in the Waterfront Port Development Zone, provided that, notwithstanding section 14-471(c), section 14-474(a), or any other provision of this Code, the Planning Board shall be substituted for the Board of Appeals as the reviewing authority.

In addition to the provisions of section 14-474(c)(2), such uses will:

- not impede or preclude existing or potential water-dependent development on other lots;

  Response: This project does not impede or preclude existing or water-dependent development on other lots. Both the International Marine Terminal (IMT) to the east, and Portland Yacht Services to the west include water dependent uses which are not impeded nor precluded in any way by this project.

- allow for adequate access to the water;

  Response: Our understanding of the intent of this section of the Ordinance is to protect from adverse impact whereby a development project could prohibit access to the water. An example of such adverse impact would be the construction of a single large building or a series of buildings that would span laterally from property line to property line and cut off the possibility of transit between West Commercial Street and the Fore River.

  We are not aware that this Ordinance requires a project to actively provide access to the water as part of its development plan.

  Consistent with the dimensions and orientation of the MICSF building, there is adequate opportunity to create access to the water on either the east or west sides of the building, if such access were determined to be necessary to support the operation of the facility in the future. In addition, the building setback from the edge of the Fore River allows for future development of berthing and access to potential berthing should it be needed in the future. Therefore, the current design allows for adequate access to the water, in accordance with our understanding of the intent of the Ordinance.

In addition, the proposed MICSF is an important component of the International Marine Terminal (IMT). Bulk cargo bulkheads and loading facilities that provide access to the water for freight operations are available at the adjacent IMT. As proposed, the IMT will be connected to the MICSF via an internal driveway such that container freight may readily pass from the MICSF to the IMT and vice versa. Therefore, though no bulkheads or water access are necessary or are planned to support the operation of the MICSF, it may functionally utilize the existing water access provided by the IMT.

- be compatible with water dependent and marine uses;

  Response: The cold storage facility is designed to be compatible with water dependent and marine uses and will in fact will be an important component to the adjacent International Marine Terminal (IMT), allowing for the refrigerated storage of a variety of products awaiting shipping or distribution via ship or other modes of freight transport.

- operationally support one or more water dependent use(s),or be located in a building or structure that is physically adaptable or relocatable to make way for future development of water-dependent uses; and

  Response: The cold storage facility will operationally support the adjacent International Marine Terminal, a water dependent use. The facility is intended to improve export opportunities for broad spectrum of Maine-sourced products and improve the competitiveness of the Port.

  Of further note, the siting and orientation of the MICSF building allows for sufficient opportunity to create access to the water on either the east or west sides of the building, if such access were determined to be necessary to support the operation of the facility in the future. In addition, the building setback from the edge of the Fore River allows for future development of berthing and access to potential berthing should it be needed in the future. Therefore, the current design allows for future development of water-dependent uses.

- meet any additional performance and dimensional standards set forth in Section 14-320.2 Dimensional Requirements.

  Response: The additional performance and dimensional standards from the Table in Section 14-320.2 were addressed in the original submittal. The view corridor criteria of 14-320.2 (b) has been addressed in separate memo from W&C.

The provisions of **Sec. 14-474. Conditional uses**, are addressed below (responses are given below each criteria):

(c) Conditions for conditional uses:

1. Authorized uses. A conditional use permit may be issued for any use denominated as a conditional use in the regulations applicable to the zone in which it is proposed to be located.

   Response: Cold storage is denominated as conditional use in the Waterfront Port Development Zone per Section 14-319.

2. Standards. The Board shall, after review of required materials, authorize issuance of a conditional use permit, upon a showing that the proposed use, at the size and intensity contemplated at the proposed location, will not have substantially greater negative impacts than would normally occur from surrounding uses or other allowable uses in the same zoning district. The Board shall find that this standard is satisfied if it finds that:

a. The volume and type of vehicle traffic to be generated, hours of operation, expanse of pavement, and the number of parking spaces required are not substantially greater than would normally occur at surrounding uses or other allowable uses in the same zone; and

Response: The volume and type of traffic to be generated, hours of operation, expanse of pavement, and the number of parking spaces required are not substantially greater than would normally occur at surrounding uses or other allowable uses in the same zone. Other allowable uses in the zone include, among other things: shipbuilding, marine cargo handling facilities, and marine cargo container and chassis maintenance and repair.

b. The proposed use will not create unsanitary or harmful conditions by reason of noise, glare, dust, sewage disposal, emissions to the air, odor, lighting, or litter; and

Response: Each condition is addressed below.

Noise - An acoustic study was performed for the proposed facility. The study is summarized in the Noise Modeling Analysis Report by Tech Environmental dated February 25, 2020 provided under separate cover. The results of the acoustic study were compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy. The pre-existing sound levels are in the 50-60 dBA range for daytime and nighttime sound levels. The study demonstrates that project operations will not cause an increase in the existing sound levels. The project will comply with the Maine DEP 06-096 Chapter 375 (10) Control of Noise.

Glare - The project will not cause any harmful glare. Conventional, non-glare-producing building materials will be utilized for exterior walls, rooftops, and windows. The rooftop mounted solar panels are designed to absorb incoming light using anti-reflective glass. Typical installations reflect only about 2% of incoming light, and tests have shown it similar to that of smooth water. Any reflected light will have a significantly lower intensity than glare from direct sunlight and is accepted as non-hazardous to air navigation.

Dust - During construction of the facility, appropriate erosion & sedimentation controls will be implemented, as well as necessary dust control measures. Upon completion, this project site will be completely improved maintained and will not create hazardous dust conditions. This project will be under the provisions of a Site Location of Development Permit and will follow the Maine DEP Erosion and Sediment Control Best Management Practices.

Sewage Disposal - This facility will be connected to the municipal sanitary sewer system.

Emissions to the Air - The project will not have any emissions to the air that require an air emissions license from the Maine DEP.

Odor - The proposed project will not involve any processes that emit odors.

Lighting - Exterior lighting has been designed in accordance with the City of Portland Ordinances, and is detailed further in the Site Plan Approval application.

Litter - All solid waste materials and recyclables from the proposed development will be transported and disposed of or recycled in accordance with applicable laws and regulations.

c. The design and operation of the proposed use, including but not limited to landscaping, screening, signs, loading, deliveries, trash or waste generation, arrangement of structures, and materials storage will not have a substantially greater effect/impact on surrounding properties than those associated with surrounding uses or other allowable uses in the zone.

Response: The design and operation of the proposed facility, including landscaping, screening, signs, loading, deliveries, waste and trash generation, arrangement of structures, and materials storage, is entirely compatible with surrounding properties and will not have a substantially greater effect/impact on those or surrounding uses allowed in the zone.

The proposed project has been detailed in documents provided previously with the Level III Site Plan Approval and Site Location of Development applications. Those application reports, attachments, and design drawings have been previously uploaded into the project Eplan folder. If there are any questions on the materials, please do not hesitate to let me know.

Thank you for coordinating the review of this project. If you have any questions regarding this application, please feel free to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

cc: Eric Carlson, Jedd Steinglass - Woodard & Curran, Inc.
Matthew Dieterich - Treadwell Franklin Infrastructure Capital

WEST COMMERCIAL STREET
U.S. ROUTE 1A
PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST.

N73°01'23"E
1053.20'

N16°58'37"W
149.35'

S70°47'58"W
381.52'

N:295843.13
E:2927103.20

NEW 4" WHITE STRIPING
STOP LINE, WHITE, 24-INCH WIDTH
STRIPE PAVEMENT, MATCH EXISTING PATTERN
EXISTING LIGHT TO REMAIN
EXISTING LIGHT TO REMAIN
DOUBLE 4" YELLOW PAVEMENT STRIPE
APPROXIMATE LOCATION OF EXISTING GATE TO BE PRESERVED AND PROTECTED
EXISTING FENCE TO REMAIN
7' TIPDOWN (TYP)
RAISED CONCRETE ISLAND
GATES (BY OTHERS)
CARD ACCESS
CONCRETE CURB (TYP)
INSTALL GRAVEL BETWEEN CURB AND EXISTING FENCE
REMOVE AND RESET EXISTING FENCE AS NEEDED TO INSTALL CURB, COORDINATE WITH MAINE PORT AUTHORITY
PAD MOUNTED TRANSFORMER WITH CONTAINMENT
5' WIDE CONCRETE SIDEWALK, SEE DETAIL
7' TIPDOWN
4" WHITE STRIPE AT 12" O.C.
WHEEL STOP (TYP OF 19)
EXISTING PAVEMENT TO REMAIN
SEE LANDSCAPING PLANS
6 FOOT WIDE STRIPED CROSSWALK
RAISED CONCRETE ISLAND
GUARD BOOTH (BY OTHERS)
4" YELLOW STRIPING AT 4' O.C.
SIDEWALK DETECTABLE WARNING PANEL, SEE DETAIL
7' TIPDOWN
90' VIEW CORRIDOR
EXISTING PAVEMENT TO REMAIN
SAWCUT EXISTING PAVEMENT, MATCH EXISTING GRADE (TYP)
20' WIDE SLIDING VEHICLE GATE (CONTROLLED FROM GUARD BOOTH, BY OTHERS)
HEAVY DUTY BITUMINOUS PAVEMENT (TYP)
CONNECT TO EXISTING FENCE, FIELD LOCATE TO COORDINATE TERMINATION WITH EXISTING FENCE POST LOCATION
30' WIDE SEWER EASEMENT TO CITY OF PORTLAND 31021/187 31378/333
LOAM AND SEED (TYP)
CONCRETE CURB (TYP)
BOLLARD (TYP OF 25)
BIKE RACKS (TYP OF 3)
STOP SIGN (MUTCD R1-1)
ADA ACCESSIBLE CURB RAMP
RAMP, SEE ARCHITECTURAL PLANS
STOP SIGN (MUTCD R1-1)
EXISTING FENCE TO REMAIN
LIGHT POLE (TYP) SEE SITE LIGHTING PLAN
UNITIL GAS FACILITY
20' WIDE CMP EASEMENT
EXISTING LIGHT TO REMAIN
SEE LANDSCAPE DRAWING
HANDICAP PARKING SIGN (MUTCD R7-8 & R7-8a) (TYP OF 2)
CONCRETE PAD FOR GENERATOR CONNECTION PANEL PROTECTED BY BOLLARDS
7' TIPDOWN
SIDEWALK DETECTABLE WARNING PANEL, SEE DETAIL
7' TIPDOWN
ADA ACCESSIBLE SPACE (TYP)
GENERATOR PAD
STANDARD DUTY BITUMINOUS PAVEMENT, (TYP)
4" WHITE SOLID LINE (TYP)
LIGHT POLE (TYP) SEE SITE LIGHTING PLAN
LAWN AREA (TYP), SEE LANDSCAPE PLAN
SNOW STORAGE (TYP)
5 FOOT WIDE CONCRETE SIDEWALK
7' TIPDOWN (TYP)
250' FROM H.A.T. SHORELAND ZONE
STAIRS (TYP) SEE ARCHITECTURAL PLANS
LOADING DOCK SEE ARCHITECTURAL PLANS
BOLLARD
COMPACTOR
CONCRETE LANDING GEAR PAD (SEE STRUCTURAL PLANS)
4" WHITE SOLID LINE (TYP)
SNOW STORAGE (TYP)
SITE LANDSCAPING, SEE LANDSCAPE PLANS
HIGHEST ANNUAL TIDE LINE ELEVATION 7.2 NGVD 1929
PROPOSED COLD STORAGE FACILITY FFE=14.00
TRUCK YARD RIGID (CONCRETE) PAVEMENT, SEE STRUCTURAL PLANS
LOAM AND SEED (TYP)
LIMIT OF HEAVY DUTY PAVEMENT
SNOW STORAGE (TYP)
75' SHORELAND ZONE SETBACK
24 FOOT GATE
PROPOSED 6' TALL CHAIN LINK FENCE
5 FOOT PEDESTRIAN GATE
CONNECT TO EXISTING FENCE, FIELD LOCATE TO COORDINATE TERMINATION WITH EXISTING FENCE POST LOCATION
LAND NOW OR FORMERLY OWNED BY NEW YARD, LLC 30887/247
EXISTING FENCE TO REMAIN
100 YEAR FLOOD LINE
GRAVEL WALKWAY
EXIT STAIR (TYP) SEE ARCHITECTURAL PLANS
6 FOOT TALL CHAIN LINK FENCE
24 FOOT GATE
5 FOOT PEDESTRIAN GATE
LOAM AND SEED (TYP) SEE LANDSCAPE PLANS
75' SETBACK FROM MHW
25' SETBACK FROM MHW
MEAN HIGH WATER (MHW) = 4.952'
75' SETBACK FROM MHW
25' SETBACK FROM MHW
MEAN HIGH WATER (MHW) = 4.952'
FORMER HARBOR COMMISSIONERS LINE OF 1929
N:295526.82
E:2927402.54
N21°46'06"W 105.4'
PROPERTY LINE
600'±
S37°45'10"W
400'±
S62°18'00"W
1174'±
FORE RIVER

BUILDING LAYOUT TABLE		
Point #	Northing	Easting
1	295867.59	2927302.56
2	295598.18	2927396.04
3	295716.89	2927738.20
4	295918.16	2927668.36
5	295931.97	2927708.02
6	295990.23	2927687.81
7	295977.23	2927650.34
8	295992.66	2927644.98
9	295911.91	2927412.25
10	295906.32	2927414.19

ISSUED FOR BID - NOT FOR CONSTRUCTION

30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

WOODARD & CURRAN
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COMMITMENT & INTEGRITY DRIVE RESULTS

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

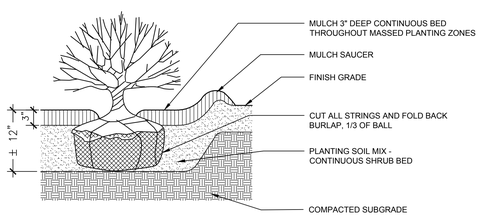
PLANT SCHEDULE -STREET TREES					
QUANT.	SYM.	BOTANICAL NAME	COMMON NAME	SIZE	
3	AC	AMELANCHIER CANADENSIS AUTUMN BRILLIANCE	SHADBLOW	6-7' MULTI, B&B	
5	AS	ACER SACCHARUM	SUGAR MAPLE	3"-3.5" CAL, B&B	
3	AR	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	3"-3.5" CAL, B&B	
18	BN	BETULA NIGRA	RIVER BIRCH	8-10' MULTI, B&B	
5	CA	CLETHRA ALNIFOLIA 'RUBY SPICE'	SUMMER SWEET	#7 CONT	
4	GT	GLEDITSIA TRIACANTHOS F. INERMIS	THORNLESS HONEYLOCUST	3"-3.5" CAL, B&B	
41	MP	MYRICA PENSYLVANICA	NORTHERN BAYBERRY	3.5'-4' HT, B&B	
24	PV	PANICUM VIRGATUM 'NORTHWIND'	SWITCH GRASS	#2 CONT.	
12	PG	PICEA GLAUCA	WHITE SPRUCE	7-8' HT., B&B	
11	PO	PICEA OMORIKA	SERBIAN SPRUCE	7-8' HT., B&B	
11	PP	PINUS PARVIFLORA 'GLAUCA'	JAPANESE WHITE PINE	7-8' HT., B&B	
19	RA	RHUS AROMATICA 'GRO-LOW'	FRAGRENT SUMAC	#3 CONT	
24	RB	RHODODENDRON 'BOULE DE NEIGE'	RHODODENDRON	2.5'-3' HT., CONT	
6	RM	RHODODENDRON MAXIMUM 'ROSEUM'	RHODODENDRON	3.5'-4' HT, CONT	
29	SS	SCHIZACHYRIUM SCOPARIUM 'PRAIRIE BLUES'	BLUE STEM	#2 CONT	
1,065 SF	TN	THELYPTERIS NOVEBORACENSIS	NEW YORK FERN	SOD	
3	VP	VIBURNUM PLICATUM F. TOMENTOSUM 'SHASTA'	DOUBLEFILE VIBURNUM	3.5'-4' HT, CONT	
6	QR	QUERCUS RUBRA	RED OAK	3"-3.5" CAL, B&B	



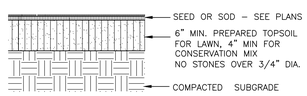
PLANTING NOTES

1. CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING AND SHALL CONTINUE UNTIL FINAL ACCEPTANCE BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF WATERING AND MAINTENANCE.
2. CONTRACTOR SHALL SUPPLY PLANTS IN QUANTITIES SUFFICIENT TO COMPLETE WORK SHOWN ON THE PLAN. ANY DISCREPANCY BETWEEN THE QUANTITIES SHOWN IN THE PLANT SCHEDULE AND THOSE REQUIRED ON THE PLAN SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL RENUMERATION. ANY DISCREPANCIES SHALL BE CLARIFIED WITH THE LANDSCAPE ARCHITECT PRIOR TO ORDERING PLANT MATERIAL.
3. ALL MATERIALS SHALL CONFORM TO SPECIFICATIONS OF THE AMERICAN STANDARDS FOR NURSERY STOCK (LATEST EDITION) AS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS THE ORIGINAL GRADES BEFORE DIGGING.
5. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
6. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT AT THE NURSERY AND AT THE SITE.
7. ALL PLANT BEDS SHALL MEET MINIMUM TOPSOIL REQUIREMENTS (SEE SPECIFICATIONS + NOTE #19 BELOW).
8. NO PLANT MATERIAL SHALL BE INSTALLED UNTIL GRUBBING, BED PREPARATION, AND FINISH GRADING HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
9. ALL PLANTS BEDS AND TREE WELLS SHALL HAVE A MINIMUM OF 3" OF UNIFORMLY DISTRIBUTED, DARK, SHREDDED BARK MULCH. ALL SHRUBS BED SHALL BE CONTINUOUS (WITH PLANTING SOIL MIX AND BARK MULCH).
10. CONTRACTOR SHALL SUBMIT SOIL SAMPLE AND TEST OF TOPSOIL TO LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. SOIL ADMIXTURE SHALL BE ADDED TO EXISTING SOIL (BY CONTRACTOR) IF DEEMED NECESSARY BY SOIL TEST RESULTS.
11. ROUGH GRADING AND BED PREPARATION SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO PLANT INSTALLATION. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT 48 HOURS PRIOR TO REQUIRED SITE VISIT.
12. ALL PLANTS SHALL BE BALLED AND WRAPPED OR CONTAINER GROWN AS SPECIFIED. ALL ROOT WRAPPING AND CONTAINER MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED AT THE TIME OF PLANTING.
13. ALL BROAD LEAF EVERGREEN PLANTS SHALL BE SPRAYED WITH AN ANTI-DESSICANT AT THE BEGINNING OF THEIR FIRST WINTER.
14. ALL PLANTS SHALL BE INSTALLED AS PER DETAILS AND THE CONTRACT SPECIFICATIONS. THE LANDSCAPE CONTRACTOR SHALL REFER TO THE CONTRACT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
15. CONTRACTOR SHALL STAKE TREES.
16. THE LANDSCAPE CONTRACTOR SHALL PROVIDE TOPSOIL FILL AS PER THE CONTRACT SPECIFICATIONS + NOTE #19.
17. ALL PLANTS SHALL BE WATERED BY THE CONTRACTOR, AS NECESSARY TO INSURE HEALTH UNTIL FINAL ACCEPTANCE.
18. THE LANDSCAPE CONTRACTOR SHALL REFER TO THE PLANT LIST AND PLANTING SPECIFICATIONS FOR SEASONAL REQUIREMENTS AND OTHER RESTRICTIONS RELATED TO THE TIME AND SEASON OF PLANTING.
19. PLANTING SOIL MIX: 1 PART COMPOST, 8 PARTS TOPSOIL, 3 PARTS HUMUS.
    TOPSOIL: FERTILE, FRIABLE, NATURAL TOPSOIL OF LOAMY CHARACTER, WITHOUT ADMIXTURE OF SUBSOIL MATERIAL, FREE FROM CLAY, LUMPS, COARSE SANDS, STONES, PLANTS, ROOTS, STICKS, AND OTHER FOREIGN MATERIALS GREATER THAN 1" IN ANY DIMENSION, PH RANGE 5.0-7.0 , AND SHALL CONTAIN NOT LESS THAN 6% ORGANIC MATTER BY WEIGHT.
    SANDY LOAM OR LOAM SOIL AS DEFINED BY THE USDA SOIL CONSERVATION SERVICE, AND HAVE THE FOLLOWING MECHANICAL ANALYSIS:

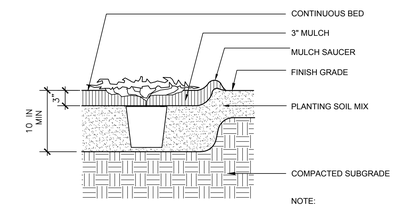
TEXTURAL CLASS	% OF TOTAL WEIGHT	AVERAGE %
SAND (0.05- 2.0 MM)	45 TO 75%	60%
SILT (0.002- 0.05 MM)	15 TO 35%	25%
CLAY (< 0.002 MM)	5 TO 25%	15%



1 SHRUB PLANTING
SCALE: N.T.S

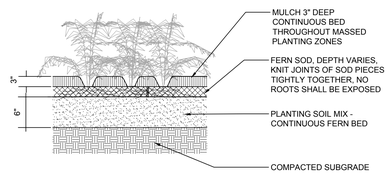


2 LAWN
SCALE: N.T.S

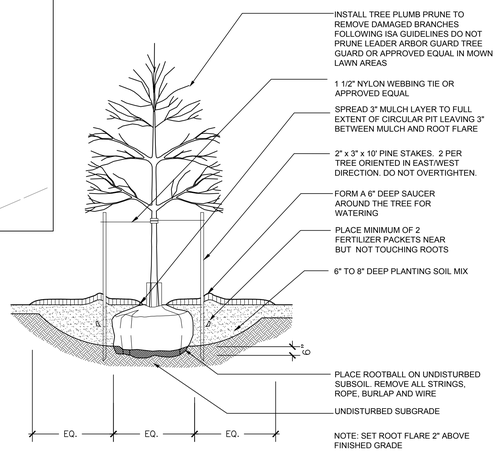


NOTE:
1. PLANT GOUNDCOVER IN STAGGERED ROWS

3 GROUND COVER PLANTING
SCALE: N.T.S



4 FERN SOD
SCALE: N.T.S



5 TREE PLANTING
SCALE: N.T.S

41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
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LICENSED LANDSCAPE ARCHITECT
PATRICK J. CARROLL NO. 127
STATE OF MAINE

REV	DESCRIPTION	DATE

DESIGNED BY: EPK | DRAWN BY: EPK | CHECKED BY: PC

REV	DESCRIPTION	DATE
5	RESPONSE TO PLANNING BOARD COMMENTS	9.29.2020
4	PERMITTING	7.27.2020
3	ISSUE FOR BID	6.23.2020
2	RESPONSE TO CITY COMMENTS	5.13.2020

LANDSCAPE PLAN

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND,MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: MAY 2020
SCALE: AS NOTED
SHEET: 1 OF 1

L-1.0

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F 207.774.6635

DRAFT MEMORANDUM

TO: Christian Roadman, City of Portland

CC: Christine Grimando, City of Portland
James Rather, City of Portland

FROM: Darrin Stairs
Jedd Steinglass

DATE: September 22, 2020

RE: Maine International Cold Storage Facility (MICSF)
Conditional Use and Dimensional Considerations

This memo has been prepared following the Planning Board workshop held on September 8, 2020, during which Planning Board members raised questions concerning the compatibility of the current MICSF design and use with certain requirements of City of Portland Code of Ordinances Chapter 14, Division 18.5: Waterfront Port Development Zone. The two questions highlighted during this workshop pertain to:

1. Conditional use standard "allow for adequate access to the water;" and

2. Dimensional requirement "For each lot, at least one view corridor of at least ninety (90) feet in width shall be left unbuilt to preserve a clear line of sight between West Commercial Street and the water."

A discussion of the proposed MICSF design and use relative to these sections of Division 18.5 follows.

Allow for Adequate Access to The Water

Our understanding of the intent of this section of the Ordinance is to protect from adverse impact whereby a development project could prohibit access to the water. An example of such adverse impact would be the construction of a single large building or a series of buildings that would span laterally from property line to property line and cut off the possibility of transit between West Commercial Street and the Fore River.

We are not aware that this Ordinance requires a project to actively provide access to the water as part of its development plan.

Consistent with the dimensions and orientation of the MICSF building, there is adequate opportunity to create access to the water on either the east or west sides of the building, if such access were determined to be necessary to support the operation of the facility in the future. In addition, the building setback from the edge of the Fore River allows for future development of berthing and access to potential berthing should it be needed in the future. Therefore, the current design allows for adequate access to the water, in accordance with our understanding of the intent of the Ordinance.

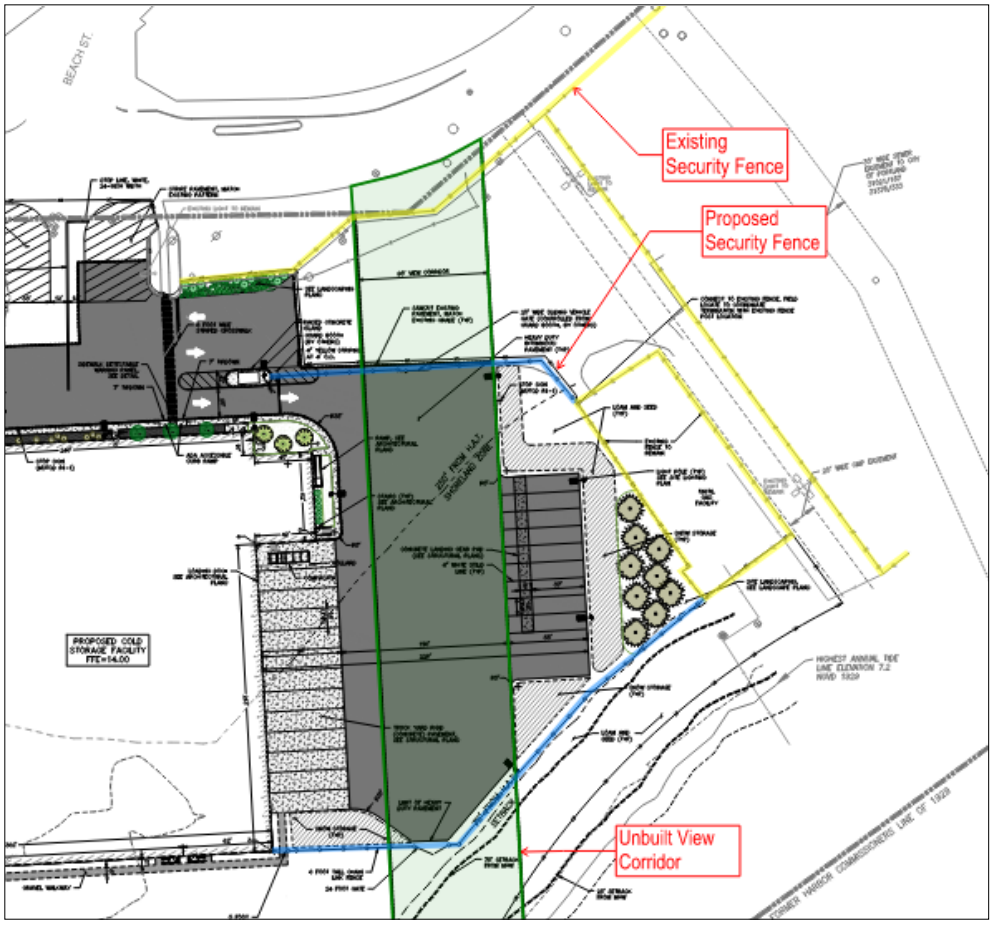
In addition, the proposed MICSF is an important component of the International Marine Terminal (IMT). Bulk cargo bulkheads and loading facilities that provide access to the water for freight operations are available at the adjacent IMT. As proposed, the IMT will be connected to the MICSF via an internal driveway such that container freight may readily pass from the MICSF to the IMT and vice versa. Therefore, though no bulkheads or water access are necessary or are planned to support the operation of the MICSF, it may functionally utilize the existing water access provided by the IMT.

Unbuilt View Corridor

It is our understanding that the intent of this dimensional requirement is to prevent the construction of buildings that would eliminate views of the Fore River from West Commercial Street and the areas beyond. Like the scenario noted above, we believe this requirement was included to prevent the construction of a single large building or a series of buildings that would span laterally from property line to property line and eliminate the possibility of viewing the Fore River from West Commercial Street.

The current MICSF design drawings present one 90-foot view corridor as an unbuilt area located east of the proposed building. Therefore, no buildings proposed as part of this project will impede of this view corridor and we feel that the efforts made during building design and site layout fulfill the intent of the Ordinance. It is relevant to note that much greater than 90 feet of unbuilt land exist east of the proposed facility, though the drawings have been presented to show only the 90-foot dimension to demonstrate that the requirement has been met.

During the September 8, 2020 Planning Board Workshop, there was some discussion of the characteristics of the existing security fence that spans the length of the MICSF property along West Commercial Street, east of Beach Street (see snip below). Planning Board members noted that the existing security fence configuration was permeable and allowed pedestrians to view beyond the fence line. We do not feel that fencing, light poles, landscaping, or similar features that are integral or contribute to the function of the project qualify as buildings or built features. Though additional security fencing will be necessary within the interior of the MICSF site, the development team plans to use similar permeable materials such that views beyond the interior fence line will not be prohibited.



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September 28, 2020

Christian Roadman
City of Portland Planner
389 Congress Street
Portland, ME 04101

Re: Maine International Cold Storage Facility | 40 West Commercial Street
Conditional Use Criteria

Dear Christian:

On behalf of Maine International Cold Storage Facility (MICSF) LLC, Woodard & Curran (W&C) is submitting this memo to address Conditional Use Criteria relevant to the project. This is supplemental to materials previously submitted for the Level III Site Plan Application No. PL-001042-2020, and Conditional Use Application No. CU-001146-2020.

The primary proposed use, cold storage facility, is considered a Conditional Use, per **Section 14-319-Permitted Uses** of the City of Portland's Chapter 14, Land Use Code of Ordinances.

Per **Sec. 14-320. Conditional use standards,** Conditional uses shall be permitted in the Waterfront Port Development Zone, provided that, notwithstanding section 14-471(c), section 14-474(a), or any other provision of this Code, the Planning Board shall be substituted for the Board of Appeals as the reviewing authority.

In addition to the provisions of section 14-474(c)(2), such uses will:

- not impede or preclude existing or potential water-dependent development on other lots;

  Response: This project does not impede or preclude existing or water-dependent development on other lots. Both the International Marine Terminal (IMT) to the east, and Portland Yacht Services to the west include water dependent uses which are not impeded nor precluded in any way by this project.

- allow for adequate access to the water;

  Response: Our understanding of the intent of this section of the Ordinance is to protect from adverse impact whereby a development project could prohibit access to the water. An example of such adverse impact would be the construction of a single large building or a series of buildings that would span laterally from property line to property line and cut off the possibility of transit between West Commercial Street and the Fore River.

  We are not aware that this Ordinance requires a project to actively provide access to the water as part of its development plan.

  Consistent with the dimensions and orientation of the MICSF building, there is adequate opportunity to create access to the water on either the east or west sides of the building, if such access were determined to be necessary to support the operation of the facility in the future. In addition, the building setback from the edge of the Fore River allows for future development of berthing and access to potential berthing should it be needed in the future. Therefore, the current design allows for adequate access to the water, in accordance with our understanding of the intent of the Ordinance.

In addition, the proposed MICSF is an important component of the International Marine Terminal (IMT). Bulk cargo bulkheads and loading facilities that provide access to the water for freight operations are available at the adjacent IMT. As proposed, the IMT will be connected to the MICSF via an internal driveway such that container freight may readily pass from the MICSF to the IMT and vice versa. Therefore, though no bulkheads or water access are necessary or are planned to support the operation of the MICSF, it may functionally utilize the existing water access provided by the IMT.

- be compatible with water dependent and marine uses;

  Response: The cold storage facility is designed to be compatible with water dependent and marine uses and will in fact will be an important component to the adjacent International Marine Terminal (IMT), allowing for the refrigerated storage of a variety of products awaiting shipping or distribution via ship or other modes of freight transport.

- operationally support one or more water dependent use(s),or be located in a building or structure that is physically adaptable or relocatable to make way for future development of water-dependent uses; and

  Response: The cold storage facility will operationally support the adjacent International Marine Terminal, a water dependent use. The facility is intended to improve export opportunities for broad spectrum of Maine-sourced products and improve the competitiveness of the Port.

  Of further note, the siting and orientation of the MICSF building allows for sufficient opportunity to create access to the water on either the east or west sides of the building, if such access were determined to be necessary to support the operation of the facility in the future. In addition, the building setback from the edge of the Fore River allows for future development of berthing and access to potential berthing should it be needed in the future. Therefore, the current design allows for future development of water-dependent uses.

- meet any additional performance and dimensional standards set forth in Section 14-320.2 Dimensional Requirements.

  Response: The additional performance and dimensional standards from the Table in Section 14-320.2 were addressed in the original submittal. The view corridor criteria of 14-320.2 (b) has been addressed in separate memo from W&C.

The provisions of **Sec. 14-474. Conditional uses**, are addressed below (responses are given below each criteria):

(c) Conditions for conditional uses:

1. Authorized uses. A conditional use permit may be issued for any use denominated as a conditional use in the regulations applicable to the zone in which it is proposed to be located.

   Response: Cold storage is denominated as conditional use in the Waterfront Port Development Zone per Section 14-319.

2. Standards. The Board shall, after review of required materials, authorize issuance of a conditional use permit, upon a showing that the proposed use, at the size and intensity contemplated at the proposed location, will not have substantially greater negative impacts than would normally occur from surrounding uses or other allowable uses in the same zoning district. The Board shall find that this standard is satisfied if it finds that:

a. The volume and type of vehicle traffic to be generated, hours of operation, expanse of pavement, and the number of parking spaces required are not substantially greater than would normally occur at surrounding uses or other allowable uses in the same zone; and

Response: The volume and type of traffic to be generated, hours of operation, expanse of pavement, and the number of parking spaces required are not substantially greater than would normally occur at surrounding uses or other allowable uses in the same zone. Other allowable uses in the zone include, among other things: shipbuilding, marine cargo handling facilities, and marine cargo container and chassis maintenance and repair.

b. The proposed use will not create unsanitary or harmful conditions by reason of noise, glare, dust, sewage disposal, emissions to the air, odor, lighting, or litter; and

Response: Each condition is addressed below.

Noise - An acoustic study was performed for the proposed facility. The study is summarized in the Noise Modeling Analysis Report by Tech Environmental dated February 25, 2020 provided under separate cover. The results of the acoustic study were compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy. The pre-existing sound levels are in the 50-60 dBA range for daytime and nighttime sound levels. The study demonstrates that project operations will not cause an increase in the existing sound levels. The project will comply with the Maine DEP 06-096 Chapter 375 (10) Control of Noise.

Glare - The project will not cause any harmful glare. Conventional, non-glare-producing building materials will be utilized for exterior walls, rooftops, and windows. The rooftop mounted solar panels are designed to absorb incoming light using anti-reflective glass. Typical installations reflect only about 2% of incoming light, and tests have shown it similar to that of smooth water. Any reflected light will have a significantly lower intensity than glare from direct sunlight and is accepted as non-hazardous to air navigation.

Dust - During construction of the facility, appropriate erosion & sedimentation controls will be implemented, as well as necessary dust control measures. Upon completion, this project site will be completely improved maintained and will not create hazardous dust conditions. This project will be under the provisions of a Site Location of Development Permit and will follow the Maine DEP Erosion and Sediment Control Best Management Practices.

Sewage Disposal - This facility will be connected to the municipal sanitary sewer system.

Emissions to the Air - The project will not have any emissions to the air that require an air emissions license from the Maine DEP.

Odor - The proposed project will not involve any processes that emit odors.

Lighting - Exterior lighting has been designed in accordance with the City of Portland Ordinances, and is detailed further in the Site Plan Approval application.

Litter - All solid waste materials and recyclables from the proposed development will be transported and disposed of or recycled in accordance with applicable laws and regulations.

c. The design and operation of the proposed use, including but not limited to landscaping, screening, signs, loading, deliveries, trash or waste generation, arrangement of structures, and materials storage will not have a substantially greater effect/impact on surrounding properties than those associated with surrounding uses or other allowable uses in the zone.

Response: The design and operation of the proposed facility, including landscaping, screening, signs, loading, deliveries, waste and trash generation, arrangement of structures, and materials storage, is entirely compatible with surrounding properties and will not have a substantially greater effect/impact on those or surrounding uses allowed in the zone.

The proposed project has been detailed in documents provided previously with the Level III Site Plan Approval and Site Location of Development applications. Those application reports, attachments, and design drawings have been previously uploaded into the project Eplan folder. If there are any questions on the materials, please do not hesitate to let me know.

Thank you for coordinating the review of this project. If you have any questions regarding this application, please feel free to contact me at (207) 558-3662 or by email at dstairs@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

cc: Eric Carlson, Jedd Steinglass - Woodard & Curran, Inc.
Matthew Dieterich - Treadwell Franklin Infrastructure Capital

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Att. V

Via Electronic Mail

June 10, 2020

Department of Planning & Development
Attn: Christian Roadman
City of Portland
389 Congress Street
Portland, ME 04101

Re: Maine International Cold Storage Facility Neighborhood Meeting Certification

To Whom It May Concern:

I, Darrin Stairs, PE of Woodard & Curran, hereby certify that a neighborhood meeting was held on June 10, 2020, via an online meeting platform (Zoom), at 5:30pm regarding the Level III Site Plan Submittal for the proposed Maine International Cold Storage Facility project located at 40 W. Commercial Street.

I also certify that on May 29, 2020 invitations were mailed to the following:

1. All addresses on the abutters list provided by the Planning Division which includes property owners within 500 feet of the proposed development.

2. Residents on the "interested parties" list.

Sincerely,

WOODARD & CURRAN INC.

Darrin Stairs, PE
Project Manager

Attached to this certification are:

1. Copy of the meeting notice sent
2. Attendance sheet
3. Meeting Minutes

Dear Neighbor:

Please join us for a neighborhood meeting to discuss plans for a cold-storage facility.

Meeting Location: visit https://tficapital.com/micsf-neighborhood-zoom-meeting-registration/ to register to receive a Zoom invitation
Meeting Date: Wednesday, June 10th, 2020
Meeting Time: 5:30pm, EST

The city code requires that property owners within 500 feet (1000 feet for proposed industrial subdivisions and industrial zone changes) of the proposed development and residents on an "interested parties list", be invited to participate in a neighborhood meeting. A sign-in sheet will be circulated and minutes of the meeting will be take. Both sign-in sheet and minutes will be submitted to the Planning Board.

If you have any questions, please call
207-650-0773.

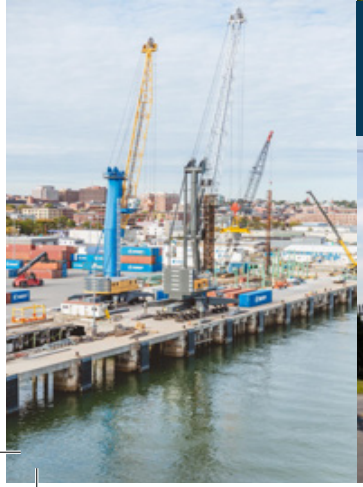
Sincerely,
Andrew Nelson

Treadwell Franklin Infrastructure
40 Forest Falls Drive, Suite 2
Yarmouth, ME 04096





Maine International Cold Storage Facility





Maine International Cold Storage Facility Public Neighborhood Meeting, June 10, 2020

First Name	Last Name	Email
Members of the Public in Attendance		
Aaron	Porter	aaron.porter@proboat.com
Bob (Robert)	Mittel	rmittel@mittelasen.com
Carl	Cramer	carl1cramer@gmail.com
David	Smith	smitti79@gmail.com
Jeff	Irish	jeffrey.irish@graybar.com
Jo	Coyne	jcoyne@gwi.net
Karen	Sarfaty	Salem St.
Katherine	Searles	Stetson Ct.
Mark	McCain	walworthmccain@maine.rr.com
Melissa	Wood	melissafwood@gmail.com
Nathan	Boutin	nathan.boutin@graybar.com
Pamela	Shaw	pskhrmail@gmail.com
Rosanne	Graef	rgraef@gwi.net
Sidney (Pete)	Thaxter	saintfelix2nd@gmail.com
Sonia	Robertson	robertsonsonia@hotmail.com
Tasha	Binette	tlaroche@nehsc.org
Tom	Robinson	thom.robinson@gmail.com
Development and Consultant Team Members in Attendance		
Abraham	Weiner	abe.weiner@huntcompanies.com
Andrew	Nelson	anelson@tficapital.com
Darrin	Stairs	dstairs@woodardcurran.com
Diane	Vatne	diane.vatne@sewall.com
Eivind	Dueland	eivind.dueland@amberinfrastructure.com
Eric	Carlson	ecarlson@woodardcurran.com
Felicia	Knight	felicia@knightcanney.com
George	Campbell	gcampbell@tficapital.com
Guy	Lebrecque	glabrecque@cwsarch.com
Jedd	Steinglass	jsteinglass@woodardcurran.com
Jon	Nass	jon.nass@maineports.com
Kay	Rand	kayrand2018@gmail.com
Matthew	Dieterich	matthew.dieterich@sewall.com
Patrick R	Arnold	parnold@solidginc.com
Tom	O'Shaugnessy	tom.oshaughnessy@amberinfrastructure.com

Maine International Cold Storage Facility
Public Neighborhood Meeting Minutes

The meeting for the neighborhood within 500 feet of the proposed Maine International Cold Storage Facility (and interested parties) was held on June 10, via Zoom, from 6-7:37 p.m.

The Zoom meeting was opened at 5:30 to allow any issues with the technology to resolve themselves prior to the scheduled start of the meeting.

Kay Rand, Outside Board Member of Sewall Company, welcomed the participants to the meeting and reviewed the logistics that would allow participants to ask questions after the presentations were complete, either by using the Zoom "raise your hand" feature, or by sending questions via Chat, or simply unmuting and posing the question. Ms. Rand also informed the participants of the tentatively scheduled workshop before the Planning Board for June 23.

Andrew Nelson, one of the owners of Treadwell Franklin Infrastructure, briefly introduced the Maine International Cold Storage Facility ("MICSF") project, describing its purpose, the types of products that would be stored and the types of customers to be served, the intermodal nature of the facility (ship, truck, rail), the connection to EIMSKIP and the Maine Port Authority, the impact of COVID-19 on the need for cold storage, and the development team's commitment to sustainability and resiliency.

Mr. Nelson then outlined all the members of the development team, including:

- Eimskip
- Amber Infrastructure
- Treadwell Franklin Infrastructure
- Maine Port Authority
- Sewall Company
- Woodard & Curran
- Sterling Solutions
- CM at Risk (to be determined)
- Operator (to be determined)
- Construction Contractors/Subcontractors (to be determined)

Mr. Nelson introduced Jedd Steinglass of Woodard & Curran who outlined the presentation to follow of the civil and site design and the architectural design of the MICSF. Mr. Steinglass introduced Darrin Stairs of Woodard & Curran to address the civic and site design components of the MICSF.

Mr. Stairs oriented the participants to the location of the MICSF; reviewed the existing conditions of the project site, then took the most time describing the proposed conditions of the site, including orientation of the building on the site; traffic analysis; landscaping, floodplain

management, and other site features such as the loading bays and truck parking areas. Mr. Stairs informed the participants that the design team is considering adding a gatehouse to control access to the loading dock area and that this feature will be available for review/discussion during subsequent planning board workshops.

Mr. Stairs introduced Guy Labrecque of CWS architects, a subcontractor to Woodard & Curran, who reviewed the architectural features of the building.

Mr. Labrecque reviewed the proposed floor plan, showed building elevations (north, south, east and west); described the materials to be used on the outside of the building; stated that the maximum height of the building will be 73 ' 10", showed the location of the building from a map of the waterfront zone, then shared aerial views of the building from several perspectives: looking southwest, looking from Memorial Park, looking from Commercial Street at a pedestrian level; looking from Beach Street at a pedestrian level; looking east from Commercial Street, and looking across the water from Thomas Knight Park in South Portland.

Mr. Labrecque introduced Abe Weiner of Amber Infrastructure who discussed the solar array that is proposed for the roof of the MICSF. The array will contain over 1600 modules, be sized at 664 kWdc, and produce 828,700 kWh of electricity annually.

Ms. Rand then opened up the meeting to questions from the participants.

Question 1: Right now, we have a long line of semis idling at Eimskip. Will this facility take care of that noise?
Answer 1: Trucks will arrive by appointment only. Overall, there will be a reduced impact of noise. Trucks will come directly from IMT to cold storage by appointment, and will be more spread out. A good portion of the noise will be kept internal to MICSF.

Question 2: Currently, we hear back up beeps from trucks starting at 6 AM. Can this be delayed until 7 AM?
Answer 2: Back up beeps are necessary safety requirements for trucks. The operation of the facility will conform to the City's noise ordinances. This is a question best answered by the operator.

Question 3: Will there be noise associated with the cooling system?
Answer 3: The cooling equipment will be internal; therefore the noise will be kept inside. There are no doors or windows to speak of in that room, and the robust insulation will dampen the sound.

Question 4: What is the current planned offset from solar?
Answer 4: We expect that it will be around 20%. We won't know the exact figures until the end of the project, but this percentage will be in the final specs.

Question 5: The height of the building has been controversial in the past. Why has the building been made so tall?
Answer 5: The building maximizes the product storage opportunities that the facility can provide as well as efficiency in construction costs.

Question 6: What is the expected construction time?
Answer 6: Construction should take 1 to 1 1/2 years to complete.

Question 7: The building is about the size that Eimskip was considering previously, correct?
Answer 7: Yes.

Question 8: Initial projections I read were that the building would be at 40% capacity once finished. Is that still the case?
Answer 8: We plan to have the facility more full than that, but bear in mind that there will be a ramp up over time. This will be private development on public land. This facility grew out of Eimskip's needs, so that was the focus of our analysis; the building needs to provide for Eimskip's needs first and foremost.

Question 9: What about the soil? Is this a Superfund site?
Answer 9: This land has been used industrially for 100 years. It is in a managed condition; environmental management is part of the construction design and the DEP and EPA will review these management plans.

Question 10: What about the people who live downwind from construction? Do we need to worry about dust?
Answer 10: Dust will be managed; it is a requirement for construction.

Question 11: Is there any public financing of this project? I understood that $8 million was needed from the public.
Answer 11: The Maine DOT is putting in $7.4 million to ready the site for leasing to TFIC/Amber. TFIC/Amber will pay this money back over time through a land lease.

Question 12: Should the state be fronting this money during the COVID-19 pandemic?
Answer 12: Maine has been working on this project for a long time and the need for cold storage worldwide, and in Maine, has only increased due to the COVID-19 pandemic.

Question 13: The state spent $60 million to keep Eimskip in the port. Does Eimskip have equity in this project?
Answer 13: Yes. You will see at the top of the organizational chart that Eimskip is one of three members of the consortium leading the project as bid lead/sponsor. Eimskip is the market facilitator, as its customers will be the ones leasing space in it. The percent of the facility that will be used by Eimskip and its customers has not been finalized yet.

Question 14: When will TFIC/Amber make a final decision on sponsoring the project?
Answer 14: The decision will be made immediately after information has been received from Sterling; these cold storage experts are performing due diligence right now. Already, a letter of intent has been signed on the land lease.

Question 15: Is it possible that Amazon or another huge corporation will come in and take over the facility?
Answer 15: No, it is not possible for a huge corporation like Amazon to come in and serve the port; serving Eimskip is the top priority. The cold storage facility is all part of a larger port strategy for the state.

Question 16: Is there a two-way agreement, or can Eimskip leave and go to Boston, for example?
Answer 16: This project is not easily re-created. Eimskip would lose a lot of money if they decided to relocate. There is also a shortage of cold storage in the entire country. TFIC plays a small part in a much bigger picture, and is comfortable with Eimskip's commitment to the project.

Question 17: Mr. Labrecque spoke about bringing things down to a human scale, especially in the front of the building, but there's almost no landscaping there even though that's the side the neighborhood will have to view. Tall trees in front would go a long way to break up the sleekness. Is that possible?
Answer 17: Mr. Labrecque will take this request into consideration.

Question 18: What customers are we looking at?
Answer 18: This is a huge opportunity for Maine producers.

Question 19: Will the ammonia refrigeration system be high charge or low charge?
Answer 19: It will be a medium charge system.

Question 20: Can there be more screening on the East end where the trucks are to keep noise down - more trees? An attractive fence?
Answer 20: The designers will take a look, but there are limited opportunities due to the size of the parcel.

Question 21: Could you please talk more specifically about the involvement of rail?
Answer 21: This will be a true multimodal facility. Rail is part of the plan, but its use will depend on the needs of customers.

Question 22: How many 18 wheelers a day will be moving up and down Commercial Street?
Answer 22: There will be about 70 trucks per day; 75% of these will come in the morning (about nine per hour), and 25% will arrive in the afternoon, all by appointment only.

Question 23: What is the best case scenario to start construction?
Answer 23: Permits need to be obtained first, and these are now in the process of review by the City. We anticipate a public hearing in late July, and we hope to have the site permits at the beginning of August, allowing construction to start in September.

Question 24: Who will be the construction manager?
Answer 24: We are in the process of identifying a construction manager.

Question 25: Can you tell us who you are interviewing?
Answer 25: We are going through an official procurement process and interviewing a large number of companies.

Question 26: We have been promised many times that the City will provide a traffic study of the impact of all recent development on all of Commercial Street. Do you know where that stands? Are you aware that there will be three buildings under construction at the same time in this area?
Answer 26: We are meeting with the transportation committee tomorrow and can ask about it. Each of the projects planned in the area are required to have an approved construction management plan. Staging for the Cold Storage Facility will be on site.

Question 27: Are all aspects of design complete? If not, where are you percentage-wise?
Answer 27: The architectural design is 95% complete. Other design is 85% complete.

Question 28: Can you give us assurance that trucks will not be left idling, especially overnight?
Answer 28: The goal of the design was to have the trucks unloaded immediately. Trucks will arrive on a set schedule by appointment only so we can control how many trucks come at once. Once the semis enter the loading bay, they will be sealed and the truck refrigeration units can be turned off.

Question 29: Will the operating contract enshrine this?
Answer 29: This information will not be explicitly stated in the permit, but it is in the submittal of documents already sent to the City and available on their website for inspection by the public.

Question 30: But these are not binding?
Answer 30: I am not an attorney, but I don't think so.

Question 31: Regarding the operator, Andy, what's your experience?
Answer 31: TFIC and Amber specialize in infrastructure. Amber has the resources. We put together the Port Everglades (Florida) cold storage facility, which is a much larger facility than this one, but there, we are the owners. We brought in experts to plan different components, such as Sterling for the cold storage unit. For the Maine International Cold Storage Facility operator, we want to find a strategic partner for the long term. TFIC will be a permanent part of this project.

Question 32: Re: Traffic. There is a lot of new construction occurring simultaneously in this neighborhood. We're also concerned with impact on neighborhood streets...not just during construction but ongoing, as commuters try to avoid increased truck traffic. Any thoughts?
Answer 32: We have a traffic meeting tomorrow with city representatives to scope out the traffic impacts of the project and will know more after that meeting.

Question 33: You mentioned some possible fencing and a guard shack; will this be at odds with the scheduled flow? Can you put this on the drawing?
Answer 33: Yes. Queuing was part of the traffic analysis. We intend to move the trucks in and out as quickly as possible, and not have them stay in the yard for long. The guard shack and fencing will be shown on subsequent drawings and renderings.

Question 34: How many construction management companies are being considered for build proposals? Can you share the names of these companies? If not, what is the reasoning for the lack of transparency at this time?
Answer 34: MaineDOT and TFIC are working through this process and are considering several companies, including Woodard &Curran. Due diligence, the site plan, and construction management are all being evaluated at the same time. We are in the middle of a process that needs the blessing of the Maine DOT and the MPA.

Question 35: Are offices going to be on the top floor?
Answer 35: Yes, but the entire facility is only one level.

Question 36: Will there be offices for rent, or are the offices only intended for the operators?
Answer 36: They are intended for the operator.

Question 37: What is Eimskip current volume of frozen produce in an out?
Answer 37: Andy Nelson will try to find out; we do not have this information.

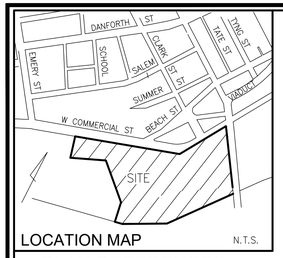
At the conclusion of the meeting, Kay Rand let everyone know that the notes from this meeting would be a matter of public record. If anyone had any further questions, Andy Nelson‘s phone number was on the card they received in the mail.

12. BOUNDARY SURVEY

A boundary survey of the project area was completed by Owen Haskell, Inc. Professional Land Surveyors in October 2019 and is attached to this Section.

12.1 ATTACHMENTS

- Boundary Survey prepared by Owen Haskell, Inc.



LOCATION MAP N.T.S.

MAINE STATE PLANE TARGET TREE WEST ZONE SEE NOTE 3

PLAN REFERENCES

1. *LAND ON WEST COMMERCIAL STREET, PORTLAND, MAINE, MAINE CENTRAL RAILROAD COMPANY TO NEW YARD LLC, DATED JULY 30, 2013, BY OWEN HASKELL, INC.*

2. *ALTA/ACSM LAND TITLE SURVEY WEST COMMERCIAL STREET PORTLAND, CUMBERLAND COUNTY, MAINE MADE FOR NEW YARD LLC BY OWEN HASKELL, INC. DATED JULY 2, 2012 REVISED THROUGH SEPTEMBER 23, 2013. RECORDED IN PLAN BOOK 213 PAGES 352 & 353.*

3. *STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP LAND ACQUISITION PLAN PART II WET COMMERCIAL STREET, PORTLAND, CUMBERLAND COUNTY, MAINE BY OWEN HASKELL, INC. DATED APRIL 25, 2014. RECORDED IN PLAN BOOK 219, PAGE 37.*

GENERAL NOTES

1. *THE FEDERAL CHANNEL LINE TAKEN FROM PLAN REFERENCE NO. 7 USING COORDINATES IN THE DIGITAL FORMAT OF SAID PLAN.*

2. *VERTICAL DATUM IS NGVD 1929 BASED UPON MAINE DEPARTMENT OF TRANSPORTATION DISK L 5 (NGS) RESET 1997 FOUND SET IN CONCRETE BRIDGE ABUTMENT THAT SUPPORTS THE BEACH STREET ON RAMP WHERE IT CONNECTS TO THE CASCO BAY BRIDGE.*

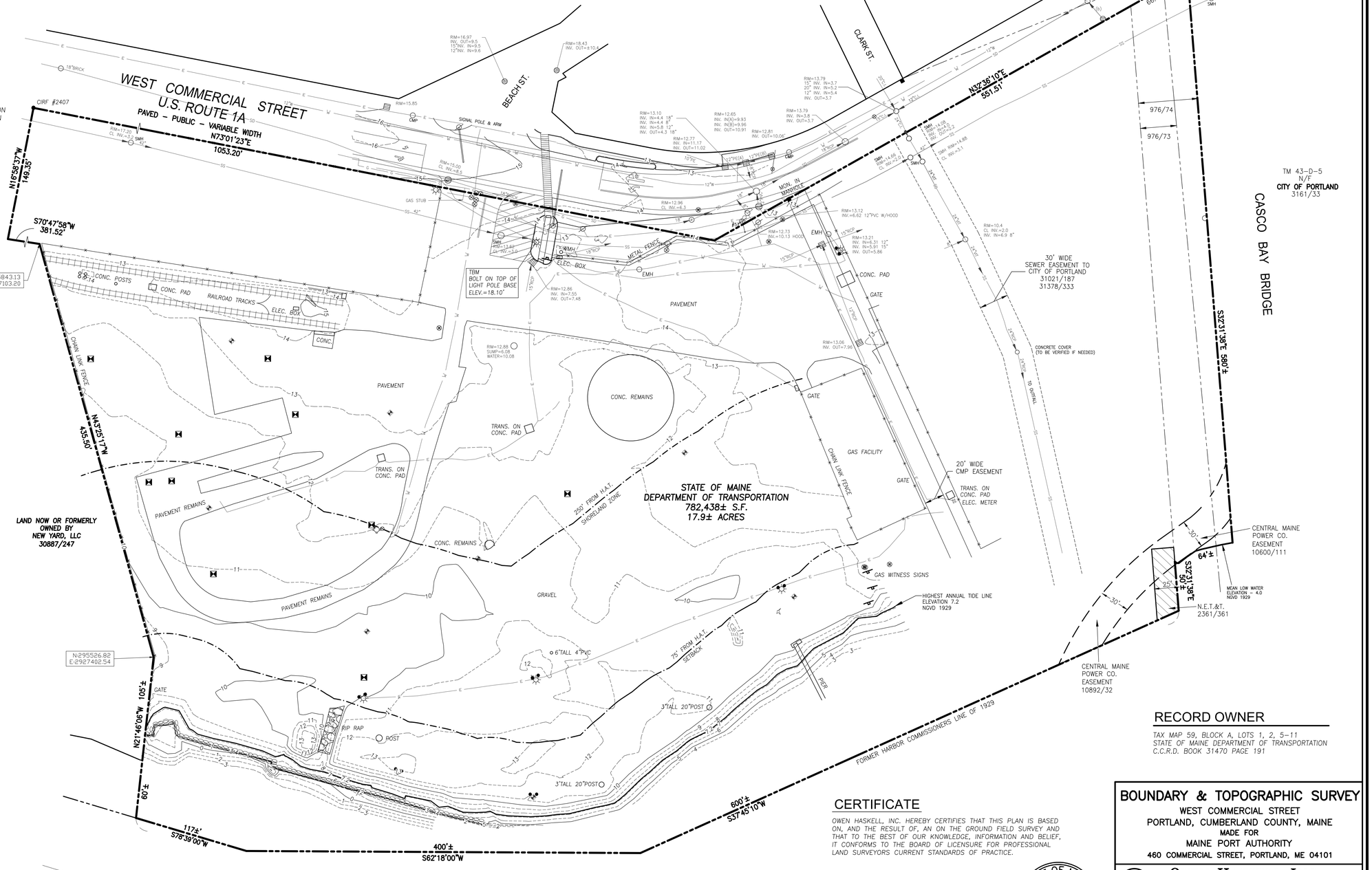
3. *BEARINGS ARE MAINE STATE PLANE WEST COORDINATES NAD 83 MAINE WEST.*

4. *THE SUBJECT PARCEL IS IN THE DIVISION 18.5 WATERFRONT PORT DEVELOPMENT ZONE & DIVISION 26 SECTION 14-446 SHORE LAND REGULATION ZONE PER THE CITY OF PORTLAND CODE OF ORDINANCES LAND USE CHAPTER 14.*

5. *THE SUBJECT PARCEL IS IN ZONE C & ZONE A2 (ELEV. 10) AS SHOWN ON THE FLOOD INSURANCE RATE MAP 230051 0016B WITH AN EFFECTIVE DATE OF JULY 17, 1986.*

UTILITY NOTE

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEY FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. CALL 1-800-DIGSAFE AT LEAST THREE BUSINESS DAYS BEFORE PERFORMING ANY CONSTRUCTION. DUE TO OSHA CONFINED SPACE REQUIREMENTS, ALL INVERTS AND PIPE SIZES MUST BE VERIFIED PRIOR TO ANY CONSTRUCTION.



LEGEND

●	IRON PIPE OR ROD FND	EMH/CMP	ELECTRIC MANHOLE
■	MONUMENT FOUND	WMH	WATER MANHOLE
⊗	GAS VALVE	x—x	FENCE
⊗	WATER VALVE		CURB
●	BOLLARD	OHW	OVERHEAD WIRES
	HYDRANT	E	UNDERGROUND ELECTRIC
	UTILITY POLE	T	TELEPHONE
	LIGHT POLE	W	WATER LINE
	MANHOLE	G	GAS LINE
	CATCH BASIN	SS	SANITARY SEWER
	SIGN	SD	STORM DRAIN
	MONITORING WELL	10	1' CONTOUR
	TEST PIT		

SCALE : 1" = 50'

0' 25' 50' 100'

RECORD OWNER

TAX MAP 59, BLOCK A, LOTS 1, 2, 5-11
STATE OF MAINE DEPARTMENT OF TRANSPORTATION
C.C.R.D. BOOK 31470 PAGE 191

CERTIFICATE

OWEN HASKELL, INC. HEREBY CERTIFIES THAT THIS PLAN IS BASED ON, AND THE RESULT OF, AN ON THE GROUND FIELD SURVEY AND THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, IT CONFORMS TO THE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS CURRENT STANDARDS OF PRACTICE.

RANDY R. LOUBIER
PROFESSIONAL LAND SURVEYOR NO. 2407
IN THE STATE OF MAINE

STATE OF MAINE RANDY R. LOUBIER 2407 PROFESSIONAL LAND SURVEYOR

BOUNDARY & TOPOGRAPHIC SURVEY

WEST COMMERCIAL STREET
PORTLAND, CUMBERLAND COUNTY, MAINE
MADE FOR
MAINE PORT AUTHORITY
460 COMMERCIAL STREET, PORTLAND, ME 04101

OWEN HASKELL, INC.
390 U.S. ROUTE ONE, FALMOUTH, ME 04105 (207) 774-0424
PROFESSIONAL LAND SURVEYORS

Drwn By	RRL	Date	Job No.
Trace By	RRL	OCTOBER 23, 2019	2019-233P
Check By	JLW	Scale	Drwg. No.
Book No.	FILE	1" = 50'	1

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN
264 US Route One, Suite 100-2A
Scarborough, ME 04074
(207) 774-4441

PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

SOLAR INFORMATION

Att. X

Solar Array
- Number of modules – Over 1,600
- Total system size – 664 kWdc
- Annual kWh production – 828,700 kWh

Annual Greenhouse Gas Equivalents
- Equivalent of powering 67.6 average US homes for one year.
- Taking 127 passenger vehicles off the road
- 645,608 pounds of coal burned
- 24,931 trash bags of waste recycled in stead of landfilled



October 8, 2020

Mr. Christian Roadman
Planner
Planning & Urban Development Department
389 Congress Street
Portland, Maine 04101

RE: COLD STORAGE FACILITY – TDM ACTIONS

Additional information was requested by the City of Portland regarding TDM actions for the proposed Cold Storage facility. The following items were outlined in the Traffic Impact Study previously submitted to the City and dated 8/25/20:

- The facility will operate over three shifts, spreading employee trips over the entire course of the day and thus reducing employee trips in both the AM and PM commuter peak hours
- There will be continuous sidewalk or multi-use trail connecting the facility allowing employees to walk to work
- There will be a bike rack and showers at the facility so that employees can bike to work
- There is a Greater Portland Metro stop within walking distance of the facility
- A Rideshare Board will be located in the employee beak room to encourage employees to ride share

Additional TDM actions that the applicant will undertake to further reduce single vehicle trips include:

- Providing bus passes for any employee who wishes to use the Metro to commute to work

It also understood that the City was concerned with the number of trucks that will occur in the commuter peak hours. The traffic study allowed for peaking in trucks during the peak hour for analysis purposes. The traffic study allowed for 12 trucks to arrive and depart in the AM peak hour whereas the average hourly truck flow in the AM peak hour will be 9. The applicant will reduce these scheduled trucks to 9 (from the 12 assumed in the study) during the AM peak hour to further reduce impact.

A TFIC Company
40 Forest Falls Drive, Suite 2 • Yarmouth, Maine 04096 • +1.207.817.5440 • sewall.com • info@sewall.com

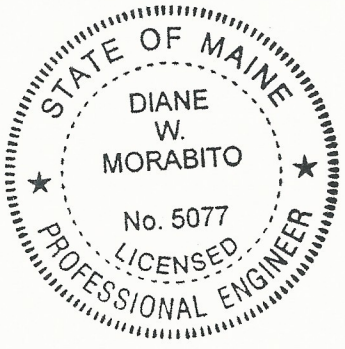
Sewall
The evolution of expertise

Further, since the Traffic Impact Study was conservative in its assumptions it is understood the City is looking for more refined peak hour estimates. The analysis performed in the traffic impact study, which included estimates of truck trips for the Cold Storage facility combined with the existing IMT trips, did not include reductions in truck trips that would result from: a) trucks leaving the IMT and traveling directly to the Cold Storage facility without using West Commercial Street and b) trucks leaving the IMT and travelling to the Merrill's Marine Terminal via the proposed Heavy Haul Road.

Based on information provided by the Maine Port Authority, a 30 % reduction in existing IMT truck trips will result following the construction of the Cold Storage facility and the Heavy Haul Road. Therefore, refined peak hour estimates for the Cold Storage facility and IMT drives for the heaviest AM peak hour are calculated below:

AM Peak Hour - 13 Existing IMT truck trips reduced to 9 (based on Maine Port Authority 30 % projection) plus 24 Cold Storage truck trips reduced to 18 (based on TDM scheduling measures referenced previously) = 27 one-way truck trips combined for the Cold Storage facility and IMT versus 37 truck trips used in the study, a 27 % reduction.

As always, please do not hesitate to contact me if you have any questions regarding this additional information.



Sincerely,

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering

MAINE INTERNATIONAL COLD STORAGE FACILITY

Site Location of Development

41 Hutchins Drive
Portland, ME 04102
800-426-4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0232277.00
Maine International Cold Storage Facility, LLC
March 2020

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AMBER
INFRASTRUCTURE GROUP

February 28, 2020

City of Portland

Planning Board

389 Congress St, 4th Floor

Portland, ME 04101

Re: Maine International Cold Storage Facility – Authorization for Permitting

To Whom it May Concern:

On behalf of Maine International Cold Storage Facility, LLC, Woodard & Curran is authorized to apply for Planning Board approval for the proposed Maine International Cold Storage Facility to be located at approximately 40 West Commercial Street in Portland. Furthermore, Woodard & Curran is authorized to act on behalf of Maine International Cold Storage Facility, LLC throughout the permitting process.

Should you have any further questions, please do not hesitate to contact me at Tom.Oshaughnessy@amberinfrastructure.com

Regards,



Tom O'Shaughnessy, President Maine International Cold Storage Facility, LLC

Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: 207-287-3901

FOR DEP USE **FORM A PAGE 1**
ATS # _____
L-_____
Total Fees: _____
Date: Received _____

****

SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.SA. §§481-490

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)	☐ **20 acre development** ☐ **Planning Permit** ☐ **Metallic Mining**	☐ **Marine Oil Terminal** ■ **Structure** ☐ **Subdivision**	☐ **Major Amendment** ☐ **Minor Amendment**

1. Name of Applicant:	Maine Intl. Cold Storage Facility, LLC	**6. Name of Agent (if applicable):**	Woodard & Curran
2. Applicant's Mailing Address:	40 Forest Falls Drive, Suite 2, Yarmouth, Maine 04096	**7. Agent's Mailing Address:**	41 Hutchins Dr., Portland, ME 04102
3. Applicant's Daytime Phone #:	(207) 817-5410	**8. Agent's Daytime Phone # :**	(207) 558-3662
4. Applicant's Fax # (if available):		**9. Agent's Fax # (if available):**	
5. Applicant's *e-mail address* (REQUIRED -license will be sent via: e-mail):	matthew.dieterich@sewall.com	**10. Agent's *e-mail address* (REQUIRED - license will be sent via e-mail):**	dstairs@woodardcurran.com

PROJECT INFORMATION

11. Name of Development:	Maine International Cold Storage Facility						
12. Map and Lot #'s:	**Map #:** 59	**Lot #:** BA 1, 2, 5-11	**13. Deed Reference #'s:**		**Book #:** 36501	**Page #:** 146	
14. Location of Project City/Town:	Portland	**15. County:**	Cumberland	**16. UTM Northing**	Unknown	**17. UTM Easting**	Unknown
18. Brief Description of Project including total parcel size:	Construction of a new 108,024 SF cold storage building and associated site improvements on a +/- 17.9 acre parcel.						

19. Type of Direct Watershed: (Check all that apply)

☐ Lake not most at risk ■ River, stream or brook ■ Coastal wetland
☐ Lake most at risk ☐ Urban impaired stream ☐ Wellhead or public water
☐ Lake most at risk, severely blooming ☐ Freshwater wetland

20. Name of Waterbody Project Site drains to:	Fore River		
21. Amount of Developed Area:	Total acres: 7.39	Existing Developed area: 7.39 acres	New Developed area: 0 acres
22. Amount of Impervious Area:	Total acres: 5.07	Existing Impervious areas 5.72 acres	New Impervious area: 0 acres

23. Development started prior to obtaining a license?:	☐ **Yes** ■ **No**		
24. .Development or any portion of the site subject to enforcement action?	☐ **Yes** ☐ **No**	**If yes**, name of enforcement staff involved?	
25. Common scheme of development?:	☐ **Yes** ☐ **No**	**26. Title, Right or Interest:**	☐ **own** ☐ **lease** ■ **purchase option** ☐ **written agreement**
27. Natural Resources Protection Act permit required?:	■ **Yes** ☐ **No**	**If yes:** ■ **PBR** ☐ **Tier 1** ☐ **Tier 2** ☐ **Full Permit**	
28. Existing DEP Permit number (if applicable):	N/A		
29. Names of DEP staff person(s) present at the pre-application meeting:	N/A		
30. Does agent have an interest in project? If yes, what is the interest?	☐ **Yes** ■ **No**		

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following :

CERTIFICATIONS / SIGNATURES

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the electronic address located on the front page of this application (see #5 for the applicant and #10 for the agent)"..

Signed:  **Title** Project Manager **Date:** 3/13/2020

Notice of Intent to Comply with Maine Construction General Permit	**With this Site Law application form and my signature, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.** **If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.** **Signed_____ Date:_____**

NOTE: You must file a MCGP Notice of Termination (Form K) within 20 days of completing permanent stabilization of the project site.

CERTIFICATION

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for development approval is complete and accurate to the best of his/her knowledge.

Signature: 

Name (print): Darrin Stairs

Date: 3/13/2020

Re/Cert/Lic No.: _____

Engineer _____

Geologist_____

Soil Scientist _____

Land Surveyor _____

Site Evaluator _____

Active Member of the Maine Bar _____

Professional Landscape Architect _____

Other_____

FORM D

SUBMISSIONS CHECKLIST

If a provision is not applicable, put "NA"

Section 1. Development description

A. Narrative

X 1. Objectives and details

X 2. Existing facilities (with dates of construction)

B. Topographic map

X 1. Location of development boundaries

X 2. Quadrangle name

C. Construction plan

X 1. Outline of construction sequence (major aspects)

2. Dates

D. Drawings

X 1. Development facilities

X a. Location, function and ground area

X b. Length/cross-sections for roads

X 2. Site work (nature and extent)

X 3. Existing facilities (location, function ground area and floor area)

4. Topography

X a. Pre- and post-development (contours 2 ft or less)

X b. Previous construction, facilities and lot lines

X **Section 2. Title, right or interest** (copy of document)

Section 3. Financial capacity

X A. Estimated costs

B. Financing

N/A 1. Letter of commitment to fund

2. Self-financing

X a. Annual report

N/A b. Bank statement

3. Other

N/A a. Cash equity commitment

N/A b. Financial plan

X c. Letter

N/A 4. Affordable housing information

Section 4. Technical ability (description)

X A. Prior experience (statement)

N/A B. Personnel (documents)

Section 5. Noise

X A. Developments producing a minor noise impact (statement)

N/A 1. Residential developments

N/A 2. Certain non-residential subdivisions

N/A 3. Schools and hospitals

X 4. Other developments

X a. Type, source and location of noise

X b. Uses, zoning and plans

N/A c. Protected locations

X d. Minor nature of impact

X e. Demonstration
N/A B. Developments producing a major noise impact (full noise study)
N/A 1. Baseline
N/A a. Uses, zoning and plans
N/A b. Protected locations
N/A c. Quiet area
N/A 2. Noise generated by the development
N/A a. Type, source and location of noise
N/A b. Sound levels
N/A c. Control measures
N/A d. Comparison with regulatory limits
N/A e. Comparison with local limits

X **Section 6. Visual quality and scenic character**(narrative, description, visual impact analysis)

X **Section 7. Wildlife and fisheries** (narrative)

X **Section 8. Historic sites** (narrative)

X **Section 9. Unusual natural areas** (narrative)

Section 10. Buffers
N/A A. Site plan and narrative

Section 11. Soils
X A. Soil survey map and report
X 1. Soil investigation narrative
X 2. Soil survey map
N/A B. Soil survey intensity level by development type
1. Class A (High Intensity) Soil Survey
2. Class B (High Intensity) Soil Survey
3. Class C (Medium High-Intensity) Soil Survey
4. Class D (Medium Intensity) Soil Survey
X C. Geotechnical Investigation
N/A D. Hydric soils mapping

Section 12. Stormwater management
A. Narrative
X 1. Development location
X 2. Surface water on or abutting the site
N/A 3. Downstream ponds and lakes
X 4. General topography
X 5. Flooding
N/A 6. Alterations to natural drainage ways
X 7. Alterations to land cover
X 8. Modeling assumptions
X 9. Basic standard
X 10. Flooding standard
X 11. General standard
X 12. Parcel size
X 13. Developed area
X 14. Disturbed area
X 15. Impervious area
B. Maps
X 1. U.S.G.S. map with site boundaries
X 2. S.C.S. soils map with site boundaries
X C. Drainage Plans (a pre-development plan and a post-development plan)

X 1. Contours
X 2. Plan elements
X 3. Land cover types and boundaries
X 4. Soil group boundaries
X 5. Stormwater quantity subwatershed boundaries
X 6. Stormwater quality subwatershed boundaries
X 7. Watershed analysis points
X 8. Hydrologic flow lines (w/flow types and flow lengths labeled)
X 9. Runoff storage areas
X 10. Roads and drives
X 11. Buildings, parking lots, and other facilities
X 12. Drainage system layout for storm drains, catch basins, and culverts
X 13. Natural and man-made open drainage channels
X 14. Wetlands
N/A 15. Flooded areas
X 16. Benchmark
X 17. Stormwater detention, retention, and infiltration facilities
X 18. Stormwater treatment facilities
N/A 19. Drainage easements
X 20. Identify reaches, ponds, and subwatersheds matching stormwater model
N/A 21. Buffers

X D. Runoff analysis (pre-development and post development)
X 1. Curve number computations
X 2. Time of concentration calculations
X 3. Travel time calculations
X 4. Peak discharge calculations
X 5. Reservoir routing calculations

X E. Flooding Standard
X 1. Variance submissions (if applicable)
X a. Submissions for discharge to the ocean, great pond, or major river
X i. Map
X ii. Drainage plan
X iii. Drainage system design
X iv. Outfall design
N/A v. Easements
N/A b. Insignificant increase
N/A i. Downstream impacts

N/A c. Submissions for discharge to a public stormwater system
N/A i. Letter of permission
N/A ii. Proof of capacity
N/A ii. Outfall analysis and design (pictures)
X 2. Sizing of storm drains and culverts
N/A 3. Stormwater ponds and basins
N/A a. Impoundment sizing calculations
N/A b. Inlet calculations
N/A c. Outlet calculations
N/A d. Emergency spillway calculations
N/A e. Subsurface investigation report
N/A f. Embankment specifications
N/A g. Embankment seepage controls
N/A h. Outlet seepage controls
N/A i. Detail sheet
N/A j. Basin cross sections
N/A k. Basin plan sheet
N/A 4. Infiltration systems
N/A a. Well locations map
N/A b. Sand and gravel aquifer map
N/A c. Subsurface investigation report with test pit or boring logs

N/A d. Permeability analysis
N/A e. Infiltration structure design
N/A f. Pollutant generation and transport analysis
N/A g. Monitoring and operations plan
N/A i. Locations of storage points of potential contaminants
N/A ii. Locations of observation wells and infiltration monitoring plan
N/A iii. Groundwater quality monitoring plan
N/A 5. Drainage easement declarations.
X F. Stormwater quality treatment plan peak discharge calculations
X 1. Basic stabilization plan
N/A a. Ditches, swales, and other open channel stabilization
X b. Culvert and storm-drain outfall stabilization
X c. Earthen slope and embankment stabilization
X d. Disturbed area stabilization
X e. Gravel roads and drives stabilization

X 2. General Standard
X a. Calculations for sizing BMP
X b. Impervious area calculation
X c. Developed area calculation
X d. Summary spreadsheet of calculations

N/A 3. Phosphorus control plan
N/A a. Calculations for the site's allowable phosphorus export
N/A b. Calculations for determining the developed site's phosphorus export
N/A c. Calculations for determining any phosphorus compensation fees
N/A 4. Offset Credits
N/A a. Urban impaired stream
N/A Offset credit calculation
N/A b. Phosphorus credit determination
N/A i. Location map
N/A ii. Scaled plan
N/A iii. Title and right
N/A iv. Demolition plan
N/A v. Vegetation plan
N/A vi. Offset credit calculation
N/A vii. Calculation for the new allowable export
X 5. Runoff treatment measures
X a. structural measures
X i. Design drawings and specifications
X ii. Design calculations
X iii. Maintenance plan
N/A iv. TSS removal or phosphorus treatment factor determinations
X v. Stabilization plan
N/A b. Vegetated buffers
N/A i. Soil survey
N/A ii. Buffer plan
N/A iii. Turnout and level spreader designs
N/A iv. Deed restrictions
N/A 6. Control plan for thermal impacts to coldwater fisheries
N/A 7. Control plan for other pollutants
X 8. Engineering inspection of stormwater management facilities

X G. Maintenance of common facilities or property
X 1. Components of the maintenance plan
X A. Maintenance of facilities by owner or operator
X 1. Site owner or operator (name legally responsible party)
X 2. Contact person responsible for maintenance
X 3. Transfer mechanism

X 4. List of facilities to be maintained
X 5. List of inspection and maintenance tasks for each facility
N/A 6. Identifications of any deed covenants, easements, or restrictions
X 7. Sample maintenance log
N/A 8. Copies of any third-party maintenance contracts
N/A B. Maintenance of facilities by homeowner's association
N/A 1. Incorporation documents for the association
N/A 2. Membership criteria
N/A 3. Association officer responsible for maintenance
N/A 4. Establishment of fee assessment for maintenance work
N/A 5. Establishment of lien system
N/A 6. Reference to department order(s) in association charter
N/A 7. Transfer mechanism from developer to association
N/A 8. List of facilities to be maintained
N/A 9. Identification of any deed covenants, easements, or restrictions
N/A 10. Renewal of covenants and leases
N/A 11. List of inspection and maintenance tasks for each facility
N/A 12. Sample maintenance log
N/A 13. Copies of any third-party maintenance contracts
N/A C. Maintenance of facilities by municipality or municipal district
N/A 1. Identification of the municipal department or utility district
N/A 2. Contact person responsible for maintenance
N/A 3. Evidence of acceptance of maintenance responsibility
N/A 4. Transfer mechanism from developer
N/A 5. List of facilities to be maintained
N/A 6. List of inspection and maintenance tasks for each facility
N/A 7. Identifications of any deed covenants, easements, or restrictions
N/A 8. Sample maintenance log
X 2. General inspection and maintenance requirements
N/A a. Drainage easements
X b. Ditches, culverts, and catch-basin systems
X c. Roadways and parking surfaces
X d. Stormwater detention and retention facilities
N/A 1. Embankment inspection and maintenance
X 2. Outlet inspection and clean-out
N/A 3. Spillway maintenance
X 4. Sediment removal and disposal
N/A e. Stormwater infiltration facilities
N/A 1. Sediment protection plan
N/A 2. Infiltration rehabilitation plan
N/A 3. Sediment removal and disposal
N/A 4. Groundwater monitoring plan
X f. Proprietary treatment devices
N/A g. Buffers
N/A h. Other practices and measures

Section 13. Urban Impaired Stream Submissions

N/A 1. Off-site credits
N/A 2. Compensation fees (Urban Impaired Stream/Phosphorus)
N/A 3. Development impacts

Section 14. Basic Standards

X A. Narrative
X 1. Soil types
N/A 2. Existing erosion problems
N/A 3. Critical areas
X 4. Protected natural resources
X 5. Erosion control measures

X 6. Site stabilization
X B. Implementation schedule
X C. Erosion and sediment control plan
X 1. Pre-development and post-development contours
X 2. Plan scale and elements
X 3. Land cover types and boundaries
N/A 4. Existing erosion problems
N/A 5. Critical areas
X 6. Protected natural resources
X 7. Locations (general)
X 8. Locations of controls
X 9. Disturbed areas
X 10. Stabilized construction entrance
X D. Details and specifications (for both temporary and permanent measures)
N/A E. Design calculations
X F. Stabilization plan
X 1. Temporary seeding
X 2. Permanent seeding
N/A 3. Sodding
X 4. Temporary mulching
X 5. Permanent mulching
X G. Winter construction plan
X 1. Dormant seeding
X 2. Winter mulching
N/A H. Third-party inspections
N/A 1. Inspector's name, address, and telephone number
N/A 2. Inspector's qualifications
N/A 3. Inspection schedule
NA 4. Contractor contact
N/A 5. Reporting protocol

Section 15. Groundwater

N/A A. Narrative
N/A 1. Location and maps
N/A 2. Quantity
N/A 3. Sources
N/A 4. Measures to prevent degradation
N/A B. Groundwater protection plan
N/A C. Monitoring plan
N/A 1. Monitoring points
N/A 2. Monitoring frequency
N/A 3. Background conditions
N/A 4. Monitoring parameters
N/A 5. Personnel qualifications
N/A 6. Proof of training
N/A 7. Equipment and methods
N/A 8. Quality assurance/quality control
N/A 9. Reporting requirements
N/A 10. Remedial action plan
N/A D. Monitoring well installation report
N/A 1. Well location map
N/A 2. Elevation data
N/A 3. Well installation data
N/A 4. Well construction details
N/A 5. Borehole logs
N/A 6. Summary of depth measurements
N/A 7. Characteristics of subsurface strata
N/A 8. Well installation contract

N/A 9. Schematic cross-sections
N/A 10. Monitoring point summary table
N/A 11. Protective casing
N/A 12. On-site well identification

Section 16. Water supply

X A. Water supply method
N/A 1. Individual wells (evidence of sufficient/healthful supply)
N/A a. Support of findings by well drillers
N/A b. Support of findings by geologist
N/A 2. Common well(s) (reports)
N/A a. Hydrogeology report
N/A b. Engineering report
N/A c. Well installation report
N/A d. Long-term safe yield and zone of influence determination
N/A e. Public water supply
N/A i. Proposed well or wells
N/A ii. Existing well or wells
N/A iii. Water quality analysis
N/A 3. Well construction in shallow-to-bedrock areas
N/A 4. Additional information
X 5. Off-site utility company or public agency
N/A 6. Other sources
N/A B. Subsurface wastewater disposal systems (locations of systems and wells)
X C. Total usage (statement re: total anticipated water usage)

Section 17. Wastewater disposal

N/A A. On-site subsurface wastewater disposal systems (investigation results)
N/A 1. Site plan
2. Soil conditions summary table
N/A 3. Logs of subsurface explorations
4. Additional test pits, borings or probes
N/A a. Soil conditions A
N/A b. Soils with Profiles 8 and 9 parent material
N/A c. Soil conditions D
N/A d. Disposal field length 60 feet or greater
N/A 5. 3-bedroom design
N/A 6. Larger disposal systems
a. System design details
N/A b. Plan view
N/A c. Cross sections
N/A d. Test pit data
N/A e. Mounding analysis
N/A B. Nitrate-nitrogen impact assessment
N/A 1. When required
N/A a. Exempted____
i. Conventional systems meeting certain setbacks
N/A ii. Denitrification systems
N/A b. Special conditions and other exemptions
N/A 2. Assumptions
N/A a. Initial concentration
N/A b. Background concentration
N/A c. Contribution from development
N/A d. Mixing and dilution
N/A e. Severe-drought scenario
N/A f. Wastewater flow to subsurface wastewater disposal fields

N/A 3. Assessment report minimum requirements
N/A a. Narrative and calculations
N/A b. Site plan
N/A i. Well locations
N/A ii. 10 mg/l and 8 mg/l isocons
N/A iii. Groundwater contours and groundwater flow divides
N/A c. References
N/A 4. Denitrification systems
N/A a. Design plans and specifications
N/A b. Installation information
N/A c. Monitoring plan
N/A d. Maintenance
N/A e. Backup system
X D. Municipal facility or utility company letter
N/A E. Storage or treatment lagoons

X **Section 18. Solid waste** (list: type, quantity, method of collection and location)
X A. Commercial solid waste facility (final disposal location)
X B. Off-site disposal of construction/demolition debris (final disposal location)
C. On-site disposal of woodwaste/land clearing debris
N/A 1. Applicability of rules (evidence re: applicability of rules)
2. Burning of wood wastes
N/A a. Delineation on site plan
N/A b. Plans for handling unburned woodwaste and woodash
N/A c. Evidence of capacity to accept waste (approved facility)
N/A d. Usage of materials
N/A e. Data on mixing ratios and application rates
X D. Special or Hazardous Waste

Section 19. Flooding
X A. Explanation of flooding impact
X B. Site plan showing 100-year flood elevation
N/A C. Hydrology analysis
X D. FEMA flood zone map with site boundaries

Section 20. Blasting
N/A A. Site Plan or map
N/A B. Report
1. Assessment
2. Blasting plan

Section 21. Air emissions (narrative and summary)
N/A A. Point and non-point sources identified
N/A B. Emission components (point sources)

Section 22. Odors
N/A A. Identification of nature/source
N/A B. Estimate of areas affected
N/A C. Methods of control)

N/A **Section 23. Water vapor** (narrative)

N/A **Section 24. Sunlight** (statement and drawing, if required)

Section 25. Notices
N/A A. Evidence that notice sent
N/A B. List of abutters for purposes of notice

1. DEVELOPMENT DESCRIPTION

This narrative report is in support of a Site Location of Development (SLOD) Permit Application for the proposed Cold Storage Facility located at 40 West Commercial Street in Portland, Maine. A letter authorizing Woodard & Curran to act at the agent on behalf of the Applicant is attached to this application.

1.1 OBJECTIVES & DETAILS

The Site was operated by Portland Gas Light Company (Portland Gas) between 1852 and 1965. During this time, coal was delivered to the Site by ship and rail and then converted into coal gas, which was used for lighting, heating, and cooking purposes. In 1965, Portland Gas ceased operations at the Site, and the manufactured gas plant (MGP) was decommissioned. In 1966, Portland Gas merged with Lewiston Gas Light Company to form Northern Utilities, Inc. (Northern Utilities). Northern Utilities and a tenant (NGL Energy Partners, LP) operated a natural gas/propane distribution facility at the Site until 2016. The Site is currently owned by the State of Maine (acquired through eminent domain on April 30, 2014) and is currently operated by the Maine Port Authority as part of the adjacent International Marine Terminal (IMT), an intermodal container shipping facility that supports cargo coming and going from the Site via rail, ship, and truck.

In 2014, the State of Maine acquired 23 acres of vacant land (which includes the Site) adjacent to the IMT to develop intermodal rail access and construct a larger trucking yard for freight transfer operations. In addition, logistics and freight capabilities have been expanded through improvements at the container terminal and ocean shipping operations facility at the IMT.

The Cold Storage Facility will be constructed in the vacant portion of the site previously occupied by a coal to gas facility and natural gas facilities. The building will be approximately 108,000 total square feet and comprised of roughly 91,000 square feet space for offloading and cold storage, 13,000 square feet of administrative space, and 4,000 square feet of mechanical and utility space. There will be 12 loading docks located on the east side of the building, as well as 12 truck parking spaces. A 24-foot wide fire access road will circulate around the building to the west and south along the Fore River.

In addition to the SLOD permit, the proposed work requires the following permits:

- City of Portland Level III Site Plan;
- City of Portland Flood Hazard Development Permit;
- MaineDEP Natural Resources Protection Act Permit-by-Rule;
- ACOE Category II Permit;
- Maine Construction General Permit Notice of Intent; and
- FAA Notice of Proposed Construction.

1.2 EXISTING FACILITIES

The area of the 17.9-acre property where the Cold Storage Facility is proposed is currently vacant. There are remnant concrete slabs and pavements, site lights, transformer pads, railroad tracks, and gravels that will be removed. Other portions of the property, outside of the proposed Cold Storage Facility, are currently being used for used for various IMT operations. There is also a gas facility operated by Unitil located on the parcel. The Existing Conditions Plan, included in the drawings submitted with this application, depicts the existing conditions of the project area, based on a ground-level survey and site observations completed by Owen-Haskell on October 23, 2019.

1.3 TOPOGRAPHIC MAP

A USGS topographic map showing the approximate location of proposed development is attached to this Section for your reference. Topography slopes generally from West Commercial Street towards the Fore River, from approximate elevation 15' down to 10' at the approximate top of bank, before breaking in slope down to the river. The Highest Annual Tide Line is at Elevation 7.2 (NGVD 1929).

1.4 CONSTRUCTION PLAN

Construction is anticipated to begin in August of 2020. Erosion and sediment control measures will be installed prior to any ground disturbing activities, as described in Section 14 of this Report. A Construction Management Plan has been submitted to the City as part of the Site Plan Application review process.

The Site will be managed during construction to minimize impacts to the adjacent land uses. Maintaining access to adjacent properties and public facilities will be a priority. Traffic impacts to adjacent roadways, including West Commercial Street and Beach Street, will be minimized during construction to the greatest extent possible. Traffic controls will consist of temporary signage and barriers where necessary to manage vehicle, pedestrian, and bicycle traffic and direct it safely around the construction area. Underground utility work and grading activities are not anticipated to impact traffic circulation at the site entrance at the intersection of Beach Street and West Commercial Street as all utilities are all stubbed into the extents of the project site and the electrical tie-in is anticipated to be competed at an existing pole located off West Commercial street. Street opening permits will not be required for these utility connections. Additionally, stormwater will be discharged through an outfall to Fore River.

Below is the anticipated sequence of construction activities for major aspects of the development:

- Installation of erosion and sediment control measures and traffic control measures;
- Demolition and site preparation activities;
- Construction of utilities, stormwater management system, and the driveway;
- Construction of the building;
- Installation of landscaping and final surface materials; and
- Removal of erosion and sediment control measures.

1.5 DRAWINGS

Design drawings showing the proposed development are included with this application.

1.6 LIST OF ATTACHMENTS

The following documents are attached to this Section:

- Topographic Map; and
- Design Drawings (Bound Separately).



0 1,000 2,000 Feet

IMT COLD STORAGE FACILITY

COMMERCIAL STREET
PORTLAND, ME

FIGURE 1 - SITE LOCATION MAP

N

WOODARD &CURRAN

Project #: 0232277.00
Map Created: September 2019

Figure Exported: 9/25/2019 By: staylslin Using: \\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Permitting\ACOE Category II Permit\Figure 1 Site Location.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** ESRI, National Geographic

2. TITLE, RIGHT, AND INTEREST

As noted on the survey, the Cold Storage Facility will be located on a parcel of land currently owned by the Maine Port Authority. A copy of the deed and the Option to Ground Lease Agreement, which serves as evidence of right, title, and interest, has been attached to this Section.

2.1 ATTACHMENTS

- Deed of Convenience, dated March 11, 2020, Cumberland County Registry of Deeds, Book 36501, Pg 146.
- Option to Ground Lease Agreement, dated March 12, 2020, between Maine Port Authority and Maine International Cold Storage Facility LLC.

DEED OF CONVENIENCE

The **STATE OF MAINE**, acting by and through its **DEPARTMENT OF TRANSPORTATION** (the "Grantor" or "MaineDOT"), under and pursuant to the provisions of 23 M.R.S. § 4424, for consideration, hereby **TRANSFERS** all its right, title and interest in and to land and rights in land situated on the southerly side of West Commercial Street in the City of Portland, County of Cumberland, State of Maine, as further described herein to **THE MAINE PORT AUTHORITY**, a body both corporate and politic in the State of Maine (the "Grantee" or "MPA"), having a mailing address of 460 Commercial Street, Portland, Maine 04101.

Said property (the "Premises") is more particularly described in the attached **Exhibit A Legal Description** and shown on the attached **Exhibit B Plans**, being copies of the following MaineDOT Right of Way Maps:

A. Plan entitled "State of Maine Department of Transportation Right of Way Map, Land Acquisition Plan Part II, West Commercial Street, Portland, Cumberland County, Maine" dated April 25, 2014 and recorded in Plan Book 219, Page 37 of the Cumberland County Registry of Deeds, and being further identified in MaineDOT's records as D.O.T. File No. 3-596.

B. Plan entitled "State of Maine Department of Transportation Right of Way Map, Land Acquisitions, West Commercial Street, Portland, Cumberland County, Maine" dated April 2014, revised March 9, 2020 and recorded in Plan Book 220, Page 63 of said Registry of Deeds and being further identified in MaineDOT's records as D.O.T. File No. 3-595.

The Premises are conveyed **SUBJECT TO** the following:

1. All easements and encumbrances of record;

2. All Certificates of Completion, all recorded covenants and restrictions, and all conditions and protections affecting the Premises as set forth in the records of the Maine Department of Environmental Protection's ("DEP") Voluntary Response Action Program ("VRAP") referencing the former Portland Gas Works site. Recorded covenants and restrictions encumbering the property include the following:

   a. Declaration of Environmental Covenant dated May 24, 2015 and recorded in Book 32334, Page 6 of said Registry of Deeds;

   b. Declaration of Environmental Covenant dated September 18, 2019 and recorded in Book 36025, Page 267 of said Registry of Deeds; and

   c. Declaration of Environmental Covenant dated September 18, 2019 and recorded in Book 36025, Page 291 of said Registry of Deeds.

3. The condition subsequent that, in the event MPA no longer uses the Premises for port-related transportation purposes, MaineDOT shall have the right, upon sixty (60) days prior written notice, to reenter and retake the Premises, and MPA shall surrender

the same and execute any documentation that MaineDOT reasonably requires to evidence the vesting of fee simple title in Maine DOT.

4. The condition that MPA shall not convey the Premises, or any portion thereof, to a third party without obtaining MaineDOT's prior written permission, which shall be granted at MaineDOT's sole discretion.

5. The terms of an existing Easement Agreement between MaineDOT and Northern Utilities, Inc. d/b/a Unitil dated December 15, 2016 and recorded in Book 33716, Page 257 of said Registry of Deeds.

6. All utility easements and installations of record and located on the Premises and to those rights that any utility enjoys over the Premises for maintenance, location or relocation of poles and other installations.

The Grantor makes no representations or warranties with respect to the Premises conveyed. The representations and warranties so excluded encompass, but are not limited to, those pertaining to: land use and environmental matters; fitness of the Premises or any portion thereof for any particular purpose; water quality or quantity; the condition or quality of the soil; inchoate or unrecorded liens; or the existence, status, or condition of access to, or public utilities serving the Premises. Any subsequent use of, improvement to, or construction on the parcel is subject to all applicable laws, regulations, ordinances, and permitting requirements.

IN WITNESS WHEREOF, the said State of Maine, acting by and through its Department of Transportation, has caused this instrument to be executed by Bruce A. Van Note, its Commissioner, thereunto duly authorized this 11th day of March in the year two thousand twenty.

STATE OF MAINE
Department of Transportation

Bruce A. Van Note, Commissioner

STATE OF MAINE
County of Kennebec

March 11, 2020

Personally appeared the above-named Bruce A. Van Note, Commissioner of the Maine Department of Transportation, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the State of Maine.

Before me,

Shelly Wood

Notary Public/Attorney at Law
Print name:
My commission expires:

SHELLY WOOD
NOTARY PUBLIC
KENNEBEC COUNTY
MAINE
MY COMMISSION EXPIRES DECEMBER 26, 2025

SEAL

Deed of Convenience
MaineDOT to Maine Port Authority
Portland, Maine

EXHIBIT A
Legal Description

THREE CERTAIN PARCELS OF LAND, together with any improvements held by the Grantor thereon and not otherwise excepted or excluded herein, situated on the southerly side of West Commercial Street in the City of Portland, County of Cumberland and State of Maine described as follows (the "Premises") and depicted on the attached **Exhibit B Plans** (the "Right of Way Maps"):

PARCEL ONE:
All land, and rights in land located within the following described boundaries:

COMMENCING at a granite monument found in a manhole located in the southerly sideline of West Commercial Street about 393' northerly of the intersection of the said West Commercial Street and Clark Street, as shown on said Right of Way Map;

THENCE S 32°36'10" W along the southerly sideline of West Commercial Street 86.09 feet to the ***point of beginning***, said point being the northeasterly corner of property conveyed by Portland Terminal Company to New Yard, LLC by deed dated July 31, 2013 and recorded in Book 30887, Page 247 of the Cumberland County Registry of Deeds;

THENCE from said point of beginning S 32°31'38" E along the westerly line of land now or formerly of the City of Portland 580 feet, more or less to mean low water;

THENCE westerly and southwesterly along mean low water 64 feet, more or less, to a point on the easterly line of land now or formerly of Casco Wharf & Storage as described in Book 1507, Page 126 of said Registry of Deeds (which is a part of the parcel herein described);

THENCE S 32°31'38" E along said easterly line of said Casco Wharf & Storage 50 feet more or less to the Former Harbor Commissioner's Line of 1929;

THENCE S 37°45'10"W along said Harbor Commissioner's Line 600 feet, more or less to a point;

THENCE S 62°18'00" W along said Harbor Commissioner's Line 400 feet, more or less, to a point;

THENCE S 78°39'00" W along said Harbor Commissioner's Line 117 feet, more or less, to the southerly corner of a parcel shown on said Right of Way Map as "Parcel 5";

THENCE N 21°46'06" W 60 feet, more or less, to the mean low water line as shown on said Right of Way Map;

THENCE continuing N 21°46'06" W 105 feet, more or less, through land now or formerly of New Yard, LLC to the southerly corner of a parcel of land formerly owned by Northern Utilities, Inc., d/b/a Until;

THENCE N 43°25'17" W along the westerly boundary of said land formerly of said Northern Utilities (which is a part of the parcel herein described) and the easterly boundary of land now or formerly of said New Yard, LLC 435.50 feet to the northwest corner of said former Northern Utilities parcel and a point that represents the northeast corner of said land now or formerly of said New Yard, LLC;

THENCE S 70°47'58" W along the northerly boundary of said land now or formerly of said New Yard, LLC 381.52 feet to land formerly of Portland Terminal Company and Maine Central Railroad Company and now of the State of Maine as described in a Notice of Condemnation recorded in Book 31408, Page 301 of said Registry of Deeds (said land now of the State of Maine being Parcel Two described herein);

THENCE N 16°58'37" W along land of the State of Maine and now or formerly owned by Portland Terminal Company and Maine Central Railroad Company 149.35 feet to the southerly side of West Commercial Street;

THENCE N 73°01'23" E along the southerly sideline of said West Commercial Street 1053.20 feet to a point;

THENCE N 32°36'10"E along the southerly sideline of said West Commercial Street 551.51 feet to the **point of beginning.**

The above described parcel contains 18 acres, more or less.

EXCEPTING FROM THE ABOVE DESCRIBED PARCEL any existing gas facilities, including without limitation, natural gas and propane pipelines, buildings, associated fixtures and related appurtenances, improvements and other personal property that are owned by or are in the custody and control of Northern Utilities, Inc., d/b/a Unitil.

MEANING AND INTENDING TO CONVEY all rights acquired by the Grantor through the following:

a. Notice of Condemnation filed in said Registry of Deeds on April 30, 2014 in Book 31470, Page 191 of said Registry of Deeds; and

b. Notice of Condemnation filed in said Registry of Deeds on May 11, 2016 in Book 33101, Page 252 of said Registry of Deeds

PARCEL TWO:

All land and rights in land within the following described boundaries:

COMMENCING at a point on the southerly sideline of West Commercial Street at the northwesterly corner of land now or formerly of New Yard, LLC recorded in the Cumberland County Registry of Deeds in Book 30887, Page 247;

THENCE, S 16°58'37" E along the westerly line of land of said New Yard, LLC 90.30 feet to the **point of beginning**;

THENCE from said point of beginning S 16°58'37" E continuing along the westerly line of land of New Yard, LLC 67.90 feet;

THENCE the following courses and distances through land of Maine Central Railroad Company:

S 66°19'39" W for a distance of 57.45 feet;
S 62°41'27" W for a distance of 125.13 feet;
S 59°26'10" W for a distance of 495.19 feet;

THENCE, along a curve to the right with a radius of 725.74 feet, having an arc length of 165.42 feet, having a chord bearing of S 65°57'58" W and chord length of 165.07 feet;

THENCE, S 72°29'45" W for a distance of 519.07 feet;

THENCE, along a curve to the right with a radius of 725.78 feet, having an arc length of 185.34 feet, having a chord bearing of S 79°48'41" W and chord length of 184.84 feet;

THENCE, S 87°07'38" W for a distance of 21.45 feet to a point;

THENCE, S 02°52'22" E for a distance of 26 feet, more or less, to the spring high tide line;

THENCE, generally westerly along the spring high tide line 1316 feet, more or less, to land now or formerly of Cianbro Corp. recorded in said Registry of Deeds in Book 3424, Page 116, being on a bearing of S 74°55'10"W a distance of 1075.68 feet from the last mentioned point;

THENCE, the following courses and distances along land of said Cianbro Corp.:

N 16°59'42" W for a distance of 171.32 feet;
S 79°48'18" W for a distance of 347.84 feet;

N 16°59'42"W for a distance of 53.00 feet to the southerly sideline of Cassidy Point Road;

THENCE, N 73°00'18" E along the southerly sideline of Cassidy Point Road 263.93 feet to the southerly sideline of West Commercial Street;

THENCE, N 82°56'03" E continuing along the southerly sideline of West Commercial Street 543.92 feet to an angle point;

THENCE, N 77°41'31" E continuing along the southerly sideline of West Commercial Street 16.88 feet;

THENCE, the following courses and distances through land of Maine Central Railroad Company:

N 84°41'57" E for a distance of 219.48 feet;
N 86°01'33" E for a distance of 312.82 feet;
N 87°07'38" E for a distance of 273.21 feet;
N 72°29'45" E for a distance of 542.24 feet;

THENCE, along a curve to the left with a radius of 673.74 feet, having an arc length of 153.57 feet, having a chord bearing of N 65°57'58" E and chord length of 153.24 feet;

THENCE, N 59°26'10"E a distance of 693.10 feet to the point of beginning.

The above described parcel contains 5.0 acres, more or less.

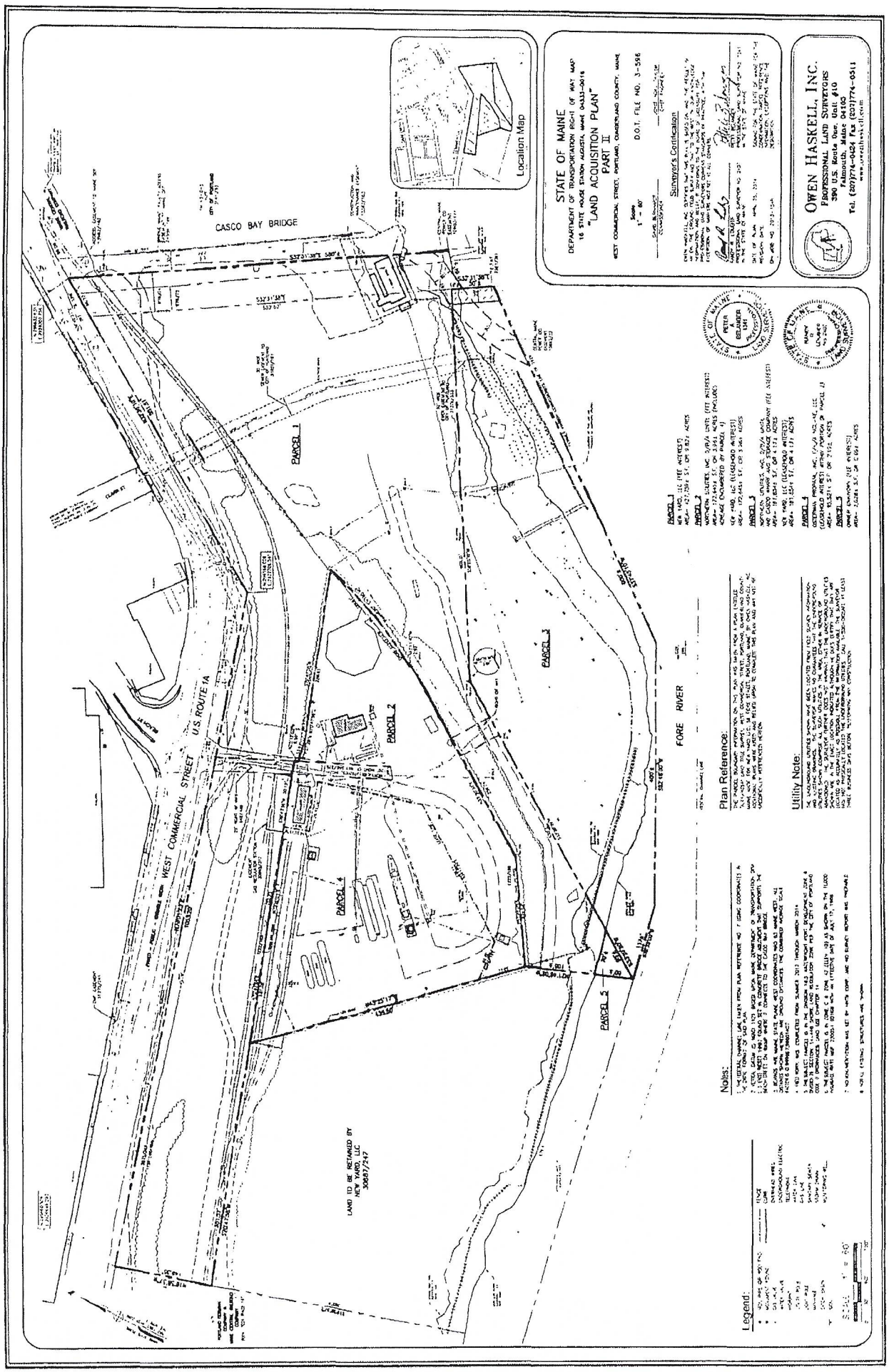
EXCEPTING FROM THE ABOVE DESCRIBED PARCEL the premises conveyed by the State of Maine to Cianbro Corporation by Governor's Deed dated January 8, 2015 and recorded in Book 32199, Page 285 of said Registry of Deeds containing 5780 square feet, more or less.

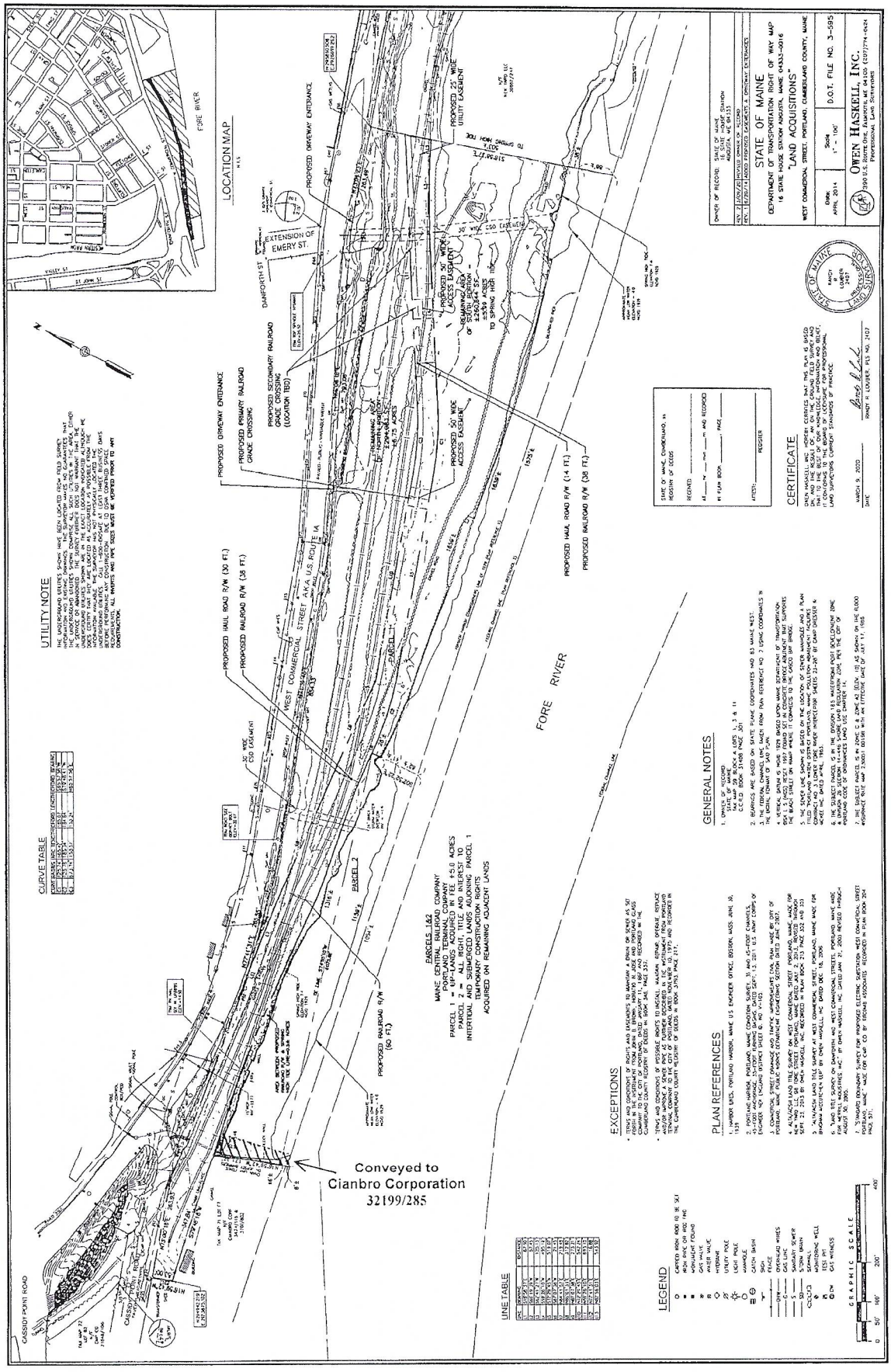
MEANING AND INTENDING TO CONVEY all rights acquired by the Grantor through its Notice of Condemnation filed in said Registry of Deeds on March 27, 2014 in Book 31408, Page 301 of said Registry of Deeds, excepting the aforementioned premises conveyed to Cianbro Corporation in Book 32199, Page 285.

PARCEL THREE:

All right, title and interest in and to the intertidal and submerged lands adjoining the parcels described above and located between the spring high tide line and the Former Harbor Commissioner's Line of 1929 as shown on said Right of Way Maps and acquired by the Grantor by virtue of the above-referenced Notices of Condemnation, to the extent that such rights are not otherwise excepted herefrom.

EXHIBIT B
Plans
(see following two pages)


STATE OF MAINE
DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP
16 STATE HOUSE STATION AUGUSTA, MAINE 04333-0016
"LAND ACQUISITION PLAN"
PART II
WEST COMMERCIAL STREET, PORTLAND, CUMBERLAND COUNTY, MAINE
Scale 1" = 80'
D.O.T. FILE NO. 3-586
Surveyor's Certification
OWEN HASKELL, INC.
PROFESSIONAL LAND SURVEYORS
390 U.S. Route One, Suite #10
Falmouth, Maine 04105
Tel. (207)774-0424 Fax (207)774-0511
www.owenhaskell.com
Location Map
CASCO BAY BRIDGE
WEST COMMERCIAL STREET
U.S. ROUTE 1A
FORE RIVER
PARCEL 1
PARCEL 2
PARCEL 3
PARCEL 4
PARCEL 5
LAND TO BE RETAINED BY NEW YARD, LLC 30661/247
Notes:
Plan Reference:
Utility Note:
Legend:



Received
Recorded Register of Deeds
Mar 12,2020 08:21:19A
Cumberland County
Nancy A. Lane

OPTION TO GROUND LEASE AGREEMENT

This OPTION TO GROUND LEASE AGREEMENT (this "**Agreement**") is entered into as of the Effective Date by and between Owner and Optionee. In consideration of the mutual promises of the parties herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Optionee and Owner hereby agree as follows:

BASIC OPTION PROVISIONS

EFFECTIVE DATE	March 12, 2020.
OWNER	The Maine Port Authority, a State of Maine "body both corporate and politic," a quasi-governmental entity created under Maine Statute at 23 M.R.S. §§ 4420-4430.
OPTIONEE	Maine International Cold Storage Facility LLC, a limited liability company.
PROPERTY	That real property consisting of the parcel(s) located in the City/Town of Portland, County of Cumberland, State of Maine, as more particularly depicted in **Exhibit A**, together with any improvements located thereon and rights, benefits and easements appurtenant to the parcel(s).
LAND	The Land is co-extensive with the Property (see Exhibit A).
OPTION PERIOD	Three (3) months from the Effective Date, which Optionee may extend for an additional period of three (3) months pursuant to Section 2(a).
OPTION PAYMENT	An amount equal to 10 and 00/100 Dollars ($10.00), to be paid up front on the Effective Date (the "**Option Payment**").

LIST OF EXHIBITS

EXHIBIT A – Depiction of the Land (entitled "Existing Conditions," "IMT WEST COLD STORAGE FACILITY," July 2015)
EXHIBIT B – Letter of Intent from Amber Infrastructure Group (January 27, 2020)
EXHIBIT C – Design-Build Agreement between Maine Port Authority and Woodard & Curran Constructors, LLC (Feb. 13, 2019, and as amended May 28, 2019)(without exhibits)
EXHIBIT D– Deed of Convenience, Book 36501, Page 146 (March 11, 2020)

1. **Grant of Option**. Owner hereby grants to Optionee the exclusive option (the "**Option**") to lease all or any portion of the Land and obtain any easements upon other portions of the Property reasonably required for access and utility connections (the "**Easements**" and together with the Land, the "**Premises**") that Optionee deems necessary for the Project (defined below), in accordance with this Agreement. If Optionee exercises the Option in accordance with Section 3 below, the parties shall enter into the ground lease agreement (the "**Lease**") as discussed in Section 4 below. "**Project**" shall mean the construction of the Maine International Cold Storage Facility as discussed in the Letter of Intent (attached as **Exhibit B**) (the "**LOI**").

2. **Option Period and Payment**.

(a) **Option Period**. The period during which the Option may be exercised shall commence on the Effective Date and continue until the expiration of the Option Period as described in the Basic Option Provisions above. Optionee shall have the right to extend the Option Period for one (1) additional three (3) month period, provided that Optionee delivers notice to Owner of its intent to extend the Option Period at least five (5) days prior to the original expiration of the Option Period. Notwithstanding the foregoing, the Option Period shall automatically terminate upon the earlier of (i) execution of the Lease by Owner and Optionee; (ii) Optionee providing written notice of its election to cancel this Agreement (in Optionee's sole and absolute discretion); or (iii) 5:00 p.m. (in the time zone where the Property is located) on the date of expiration of the Option Period (or extended Option Period, if Optionee so extends under this section).

(b) **Option Payment**. Within twenty (20) days after the Effective Date, Optionee shall pay to Owner the Option Payment.

3. **Notice of Exercise of Option**. Optionee may exercise the Option at any time during the Option Period by delivering to Owner a written notice exercising the Option (the "**Option Notice**").

4. **Lease Agreement.** If Optionee delivers an Option Notice to Owner, then Owner and Optionee shall, in good faith, negotiate and agree to a Lease over the Property. The terms and conditions of the Lease shall in all events include the relevant sections of the LOI, unless otherwise agreed by the parties.

5. **Closing**. Upon delivery of the Option Notice to Owner in accordance with Section 3 above, the execution of the Lease by Owner and Optionee (the "**Closing**") shall take place on a date mutually agreed by the Parties.

6. **Due Diligence; Title**.

(a) **Due Diligence**. Owner has already provided Optionee with a certain Design-Build Agreement between the Maine Port Authority and Woodard & Curran Constructors, LLC (attached as **Exhibit C,** without underlying exhibits). In furtherance of providing Exhibit C and related exhibits and papers, the Owner has already shared with Optionee all documents that Owner considers relevant to analyzing the Project contemplated in the LOI (Ex. B). Optionee may, at its discretion, utilize Exhibit C and its underlying documents during the Option Period or during the follow-on project, to whatever extent the Optionee deems appropriate. Owner provided Exhibit C and its related exhibits and papers to Optionee on an as-is, where-is basis without warranty, but Owner is not aware of any information contradicting Exhibit C and its underlying exhibits. If Owner becomes aware of additional documents or information that undermine or contradict any information contained in Exhibit C, Owner will notify Optionee of the same within ten (10) days.

(b) **Title**. Optionee, at its sole cost, may obtain a preliminary title report (the "**Title Report**") and/or survey (the "**Survey**") for the Property. If Optionee, in its sole discretion, determines that the existence, use, operation, implementation, or exercise of any matters identified by the Title Report or Survey could materially delay, interfere with, impair or prevent Optionee's development, operation or financing of the Project, then Optionee may notify Owner of such issues and Owner shall cooperate with Optionee in efforts to obtain a release, subordination, non-disturbance agreement, consent, or other agreement (in a form reasonably acceptable to Optionee) from the holder(s) of such rights. In the event that any holder(s) of such rights are unwilling to enter into a reasonable agreement to resolve the identified issue(s), the Optionee may, in its discretion, either accept the issue and execute the Option, thereby, subject to the terms of any definitive agreements (including the Lease), accepting the known issue, or terminate this Option, in which event the Owner will retain the Option Payment and this matter will be concluded.

7. **Right of Entry**

(a) **Investigations**. Beginning on the Effective Date and throughout the Option Period, Owner shall provide to Optionee, its employees, agents, contractors, and current or potential lenders or investors, reasonable access to the Property to conduct the Survey, evaluate, conduct and perform inspections, including soil and water testing, environmental assessments (Phase I and/or Phase II), engineering surveys, topographical, structural and geo-technical tests, and such other tests and inspections (collectively, the "**Investigations**") that Optionee may deem necessary or advisable in its sole discretion, upon Optionee providing at least twenty-four (24) hours' prior notice to Owner. Optionee shall keep the Property free from any liens arising out of any work performed, materials furnished, or obligations incurred by or on behalf of Optionee in connection with the Investigations. Optionee shall remove, or cause the removal of, any such lien by bond or otherwise within ten (10) days after Optionee becomes aware of the existence of such lien and if Optionee shall fail to do so, Owner may pay the amount necessary to remove such lien, without being responsible for investigating the validity thereof; provided, however, that the Optionee will be responsible to indemnify Owner in respect of the amounts paid to remove any such liens in accordance with § 7(b), *infra*.

(b) **Optionee Indemnification of Owner**. Optionee shall indemnify, defend and hold Owner harmless from and against all claims, losses, liabilities, damages, losses, costs or expenses (including, without limitation, reasonable attorneys' fees) (collectively, "**Claims**") which Owner may incur as a direct result of any act or wrongful omission by Optionee, its agents, or contractors in connection with the use of the Property; provided, however, that Optionee shall have no obligation or duty to indemnify, defend or hold Owner harmless from Claims (including, without limitation, Claims that the Property has declined in value) (i) arising out of, resulting from, or incurred in connection with the results or findings of Optionee's Investigations, (ii) to the extent such Claims are due to the acts or wrongful omissions of Owner or its employees, agents or contractors during the Option Period, (iii) to the extent such Claims are for any consequential or indirect loss or damage, or (iv) to the extent such Claims exceed amounts recovered by Optionee under the insurances required to be taken out pursuant § 10, *infra*. Notwithstanding the foregoing, Optionee's indemnification obligations shall not extend to any conditions on, at, or under the Property in existence as of the Effective Date, except and to the extent such conditions are aggravated by the gross negligence or willful misconduct of Optionee or its employees, agents or contractors. Optionee's obligations hereunder shall survive the termination or expiration of the Option Period for two years.

8. **Owner's Representations and Warranties**. Owner makes the following representations and warranties, which shall be true as of the Effective Date, the date the Option is exercised by Optionee, and shall survive the expiration or termination of this Agreement:

(a) **Authority**. Pursuant to a vote of the Owner's Board at a duly noticed public meeting on February 10, 2020, Owner has the full legal right, power and authority, without the consent of any additional party or parties, to enter into this Agreement and to perform its obligations hereunder. The execution and delivery of this Agreement and the consummation of all transactions and performance of all obligations contemplated hereby have been duly authorized and will not conflict with, or result in a breach of any of the terms or provisions of, or constitute a default under, any document or instrument to which Owner is a party.

(b) **Binding on Owner**. Pursuant to a vote of the Owner's Board at a duly noticed public meeting on February 10, 2020, the person executing this Agreement on behalf of Owner has full power and authority to bind Owner to the obligations set forth herein, and upon execution and delivery of the same, this Agreement will constitute a valid and binding instrument enforceable in accordance with its terms.

(c) **Exclusivity**. Owner represents and warrants it will not enter into any option, lease agreement, or similar transaction relating to the Premises with any other person or entity other than the Optionee during the Option Period (or Option Period as extended, if applicable).

(d) **Claims or Actions**. There are no current, pending or contemplated actions, administrative inquiries or proceedings, suits, arbitrations, claims or proceedings commenced by any person or governmental entity affecting Owner, the Property, or any portion thereof; provided, however, that this representation and warranty is further limited by § 8(g), *infra*..

(e) **No Violation of Laws.** To the best of Owner's knowledge, the Property is not in violation of any applicable federal, state, local or other laws, regulations or codes (the "**Laws**") and Owner has not received notice pertaining to the violation of any Laws affecting the Property or any portion thereof, and Owner has no knowledge of any facts which might be a basis for any such notice; provided, however, that this representation and warranty is further limited by § 8(g), *infra*.

(f) **Bankruptcy**. Owner has not (i) made a general assignment for the benefit of creditors; (ii) filed any voluntary petition in bankruptcy or suffered the filing of any voluntary petition by its creditors; (iii) suffered the appointment of a receiver to take possession of all or substantially all of its assets; or (iv) suffered the attachment or other judicial seizure of all or substantially all of its assets.

(g) **Fee Owner; Liens**. Owner holds the entire fee simple interest in the Property, except for the limitations on ownership detailed in the relevant Deed of Convenience from the Maine Department of Transportation to the Maine Port Authority, which is recorded at Book 36501 and Page 146 in the Cumberland County Registry of Deeds (a copy of which is attached hereto as **Exhibit D**) (the "**Deed**"), and any other encumbrances, covenants, and restrictions of record. Except as previously disclosed by Owner to Optionee in writing or as disclosed in the Title Report or Survey, Owner represents that there are no liens upon Owner's right, title or interest in the Property other than liens for monetary obligations for which Owner shall make best efforts to pursue a SNDA pursuant to § 9(a), *infra*. Except as otherwise listed in the Basic Option Provisions, Owner has not granted or entered into any other options, rights of first refusal, offers to purchase or lease or agreements to sell or lease all or any part of the Property ("**Third Party Interests**") other than with Optionee pursuant hereto.

(h) **Disclaimer of Certain Representations and Warranties**. Notwithstanding any of the foregoing representations and warranties, Owner makes no representations or warranties as to the legal or factual status of: land use and environmental matters; fitness of the Premises or any portion thereof for any particular purpose; water quality or quantity; the condition or quality of the soil; inchoate or unrecorded liens; or the existence, status, or condition of access to, or public utilities serving the Premises. Further reference is made to certain recorded covenants and restrictions, and all conditions and protections affecting the Premises as set forth in the records of the Maine Department of Environmental Protection's ("**DEP**") Voluntary Response Action Program ("**VRAP**") referencing the former Portland Gas Works site, some or all of which are listed in the relevant Deed (**Exhibit D**).

During the Option Period, Owner shall timely notify Optionee in writing of any changes affecting any of the foregoing representations and warranties.

9. **Owner's Covenants**. Owner hereby covenants and agrees that, from and after the Effective Date, though the Option Period and, if the Option is exercised, thereafter during the period up to and including the Closing:

(a) **Owner Mortgages**. Owner shall use commercially reasonable efforts to deliver to Optionee a subordination, non-disturbance and attornment agreement(s), in form and substance reasonably

acceptable to Optionee (each, a "**SNDA**") from the current holder(s) of any deed of trust, mortgage or other lien encumbering the Property. Owner shall make all payments required under any loan secured by a mortgage or deed of trust encumbering the Property and pay all real property taxes and assessments levied or imposed against the Property and before any of the same become delinquent. During the Option Period, Owner shall not mortgage or otherwise encumber its interest in the Property without providing Optionee with fifteen (15) days prior written notice thereof and an SNDA reasonably acceptable to Optionee from such holder(s) of any deed of trust, mortgage or other lien encumbering the Property. Notwithstanding anything in this § 9(a), Optionee is aware of the Maine Department of Transportation's residual interests in the Land as discussed in the Deed (Ex. D), and the Owner shall use commercially reasonable efforts to obtain such assurances or documents from the Department of Transportation as the Optionee may reasonably require.

(b) **Mortgage of Optionee's Interest**. Optionee shall have the right to obtain financing from one or more Financing Parties (such term to be defined in the Lease) by way of a direct or collateral assignment of this Agreement to a Financing Party, after providing seven days' written notice to the Owner. Owner agrees that, amongst other Financing Party protections and cure rights, Owner shall (a) acknowledge and consent to, amongst other things, Optionee assigning the Lease and the Easements and any other easements benefitting the Premises by way of direct or collateral assignment to a Financing Party, assignment of the Easements and a lease of the storage facility from such Financing Party to Optionee, grant the Financing Parties a sublease or other real property interest in Optionee's interest in and to the Premises, grant a first priority security interest in Optionee's interest in the improvements and/or the Lease and Optionee's other interests in and to the Premises, including, but not limited to, any Easements, rights of way or other similar interests; and (b) agree to execute such subordination agreements, consents, estoppels and other acknowledgements of the foregoing as Optionee or the Financing Parties may request. Notwithstanding the foregoing, Owner retains discretion to decline to acknowledge, consent, and/or agree to the items listed in this § 9(b), provided that such acknowledgement, consent, and/or agreement shall not be unreasonably withheld. Notwithstanding anything in this § 9(b), Optionee is aware of the Maine Department of Transportation's residual interests in the Land as discussed in the Deed (Ex. D), and the Owner shall use commercially reasonable efforts to obtain such additional assurances or documents from the Department of Transportation as the Optionee may reasonably require.

(c) **Permits; Cooperation with Development**. Optionee shall have the right to apply for applications for land use entitlements, environmental approvals and permits, site plans, and subdivision or minor land division requests and parcel maps. Owner shall cooperate with Optionee in Optionee's efforts to obtain such approvals by executing such documents as are reasonably necessary. Nothing in this § 9(c) relieves Optionee's obligations further discussed in § 7, *supra*; by way of example only and not limitation, these obligations include Optionee's obligation to pay for its investigations and indemnify Owner for same.

(d) **Use of the Property**. During the term of this Option, Owner will not commit waste on the Property or otherwise materially change the Property, nor will Owner agree to grant or permit any easement, lease, license, right of access or other possessory right in the Premises to any third party without the prior written consent of Optionee. Owner shall comply with all Laws applicable to the Property.

10. **Insurance.** Effective as of the date Optionee enters the Property for the Investigations, and continuing through the Option Period, Optionee shall obtain and maintain liability insurance for its activities on the Property. Such insurance will be in the amount of One Million Dollars ($1,000,000) per occurrence and a Ten Million Dollar ($10,000,000) policy limit, and will name Owner as an additional insured but only for liability arising out of Optionee's operations on the Property including, without limitation, coverage for damage or harm caused or incurred by Optionee and its employees and agents.

11. **Assignment**. Optionee shall have the right to assign its rights and obligations under this Agreement to any Optionee affiliate, third party, and/or party providing financing to Optionee only with the prior written consent of Owner. Owner shall not have any right to assign its rights and obligations under this Agreement without Optionee's prior written consent, not to be unreasonably withheld, conditioned or delayed.

12. **Termination**.

(a) **Default**. Each of the following events shall constitute an event of default by the applicable party and shall permit the non-defaulting party to terminate this Agreement and pursue the remedies at law described below, which, as to Owner, shall consist solely of the remedies at law described in Section 11(b) below, and, as to Optionee, shall consist solely of the remedies at law contained in Section 11(c) below.

(i) The failure of Optionee to pay the amount required to be paid hereunder when due.

(ii) The failure of either party to perform any of the other terms, agreements or conditions set forth in this Agreement, where such failure continues for thirty (30) days (or such longer period required to cure such failure, not to exceed sixty (60) days), after receipt of written notice from the other party; or

(iii) A party files for bankruptcy or has an involuntary petition in bankruptcy or a request for appointment of a receiver filed against it, where such involuntary petition or request is not dismissed within ninety (90) days after filing.

(b) **Owner Remedies – Liquidated Damages**. EXCEPT FOR OPTIONEE'S INDEMNIFICATION OBLIGATIONS CONTAINED IN THIS AGREEMENT, OWNER'S SOLE REMEDY AT LAW UPON AN EVENT OF DEFAULT BY OPTIONEE SHALL BE TO RETAIN THE OPTION PAYMENTS IT HAS THEN RECEIVED AS LIQUIDATED DAMAGES FOR SUCH DEFAULT OF OPTIONEE, AND IN SUCH EVENT, OPTIONEE SHALL HAVE NO FURTHER RIGHT WHATSOEVER TO LEASE THE PREMISES AND OWNER SHALL HAVE NO RIGHT TO SEEK ANY FURTHER DAMAGES OR REMEDY AT LAW. THE PARTIES AGREE THAT IT WOULD BE IMPRACTICAL AND/OR EXTREMELY DIFFICULT TO ASCERTAIN THE ACTUAL DAMAGES THAT WOULD BE SUFFERED BY OWNER AS A RESULT OF ANY SUCH DEFAULT BY OPTIONEE, AND THAT UNDER THE CIRCUMSTANCES EXISTING AS OF THE DATE OF THIS AGREEMENT, THE LIQUIDATED DAMAGES PROVIDED FOR IN THIS SECTION REPRESENT A REASONABLE ESTIMATE OF THE DAMAGES WHICH OWNER WILL INCUR AS A RESULT OF ANY SUCH DEFAULT BY OPTIONEE. SUCH RETENTION OF THE OPTION PAYMENTS BY OWNER IS INTENDED TO CONSTITUTE LIQUIDATED DAMAGES TO OWNER AND SHALL NOT BE DEEMED TO CONSTITUTE A FORFEITURE OR PENALTY.

(c) **Optionee Remedies – Liquidated Damages**. OPTIONEE'S SOLE REMEDY AT LAW UPON AN EVENT OF DEFAULT BY OWNER SHALL BE TO RECOVER AN AMOUNT EQUAL TO THE OPTION PAYMENT(S) IT HAS THEN PAID AS LIQUIDATED DAMAGES AS RECOMPENSE FOR SUCH DEFAULT OF OWNER. THE PARTIES AGREE THAT IT WOULD BE IMPRACTICAL AND/OR EXTREMELY DIFFICULT TO ASCERTAIN THE ACTUAL DAMAGES THAT WOULD BE SUFFERED BY OPTIONEE AS A RESULT OF ANY SUCH DEFAULT BY OWNER, AND THAT UNDER THE CIRCUMSTANCES EXISTING AS OF THE DATE OF THIS AGREEMENT, THE LIQUIDATED DAMAGES PROVIDED FOR IN THIS SECTION REPRESENT A REASONABLE ESTIMATE OF THE DAMAGES WHICH OWNER WILL INCUR AS A RESULT OF ANY SUCH DEFAULT BY OWNER. SUCH RECOVERY OF AN AMOUNT EQUAL TO THE OPTION

PAYMENTS TO OWNER IS INTENDED TO CONSTITUTE LIQUIDATED DAMAGES FOR OPTIONEE AND SHALL NOT BE DEEMED TO CONSTITUTE A FORFEITURE OR PENALTY.

(d) **Equitable and Statutory Remedies**. Notwithstanding any of the foregoing, both parties retain all rights to pursue equitable remedies (e.g. injunctive relief) and non-monetary statutory relief (e.g. forcible entry and detainer) as may be cognizable against the other. In no event will money damages, costs of suit, attorney's fees, interest, or any other amounts of money of any description be awarded to either party against the other to exceed the amount of liquidated damages described in § 12(b)-(c), *supra*. In the event the Parties are unable to negotiate to a mutually agreeable Lease, the maximum equitable remedy available will be an order to continue negotiating in good faith for a reasonable amount of time; in no event can either party be ordered to enter into a Lease as specific performance of this Option.

(e) **Termination by Optionee Absent Default by Owner**. If Optionee determines, in its sole and absolute discretion, that the Land is unsuitable or undesirable for leasing by Optionee, Optionee shall have the right to terminate this Agreement by giving written notice thereof to Owner and this Agreement shall terminate on the date specified in Optionee's written notice. If the Agreement is terminated during the Option Period pursuant to the preceding sentence, then neither party shall have any further rights or obligations hereunder; provided, however, that Owner shall retain all Option Payments it shall have received hereunder prior to the date of termination of the Option Agreement and any provisions hereof that expressly survive termination of this Agreement shall remain in effect.

13. **Miscellaneous**.

(a) **Investigatory Results**. For any Investigation undertaken by Optionee that involved entry onto the Premises by Optionee or any of its employees, contractors, or agents of any kind, Optionee will provide a copy of such investigatory reports, findings, or results of any kind to Owner within fourteen (14) days of such investigatory reports, findings, or results, at no charge to Owner. These materials may be provided electronically. By way of example only and not limitation, expressly included in this duty to turn over reports and findings are any soil sample findings and land survey results.

(b) **Waiver of Jury Trial and Selection of Venue**. EACH PARTY HERETO WAIVES, TO THE FULL EXTENT PERMITTED BY LAW, THE RIGHT TO A JURY TRIAL IN ANY LITIGATION CONCERNING THIS AGREEMENT OR ANY DEFENSE, CLAIM, COUNTERCLAIM, CLAIM OF SET-OFF OR SIMILAR CLAIM OF ANY NATURE. THE PARTIES AGREE THAT ANY DISPUTES OVER THIS AGREEMENT WILL BE LITIGATED EXCLUSIVELY IN THE MAINE STATE COURTS, AND WAIVE THE RIGHT TO PURSUE ANY DEFENSE, CLAIM, COUNTERCLAIM, CLAIM OF SET-OFF OR SIMILAR CLAIM OF ANY NATURE IN ANY OTHER FORUM. EACH PARTY CONSENTS IN ADVANCE TO PERSONAL JURISDICTION IN THE MAINE STATE COURTS.

(c) **Counterparts**. This Agreement may be executed in counterparts. All executed counterparts shall constitute one agreement, and each counterpart shall be deemed an original. The parties hereby agree signatures transmitted by facsimile or email shall be legal and binding and shall have the same full force and effect as if an original of this Agreement had been delivered and hereby waive any defenses to the enforcement of the terms of this Agreement based on the foregoing forms of signature.

(d) **Time Periods**. If any date for exercise of any right, giving of any notice, or performance of any provision of this Agreement falls on a Saturday, Sunday or holiday, the time for performance will be extended to the next business day.

(e) **No Waiver**. The failure of either party to require strict performance by the other party of any provision of this Agreement will not be considered a waiver of any other provision, nor prevent any party from enforcing that or any other performance at any time thereafter.

(f) **Further Assurances**. The parties shall at their own cost and expense execute and deliver such further documents and instruments and shall take such other actions as may be reasonably required or appropriate to carry out the intent and purposes of this Agreement.

(g) **Governing Law**. This Agreement is made pursuant to, and shall be construed and enforced in accordance with, the laws of the State of Maine.

(h) **Amendments; Entire Agreement**. This Agreement contains the entire agreement between the parties and is intended by the parties to set forth their entire agreement with respect to the subject matter hereof, and any agreement hereafter made shall be ineffective to change, modify or discharge this Agreement, in whole or in part, unless such agreement is in writing and signed by the party against whom enforcement of the change, modification or discharge is sought. Owner and Optionee agree that all prior or contemporaneous oral or written agreements between or amongst themselves or their agents are merged in or revoked by this Agreement.

(i) **Partial Invalidity**. If any term or provision of this Agreement is, to any extent, determined by a court of competent jurisdiction to be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each remaining term and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

(j) **Successors and Assigns**. This Agreement, and the rights and obligations of the parties hereto, shall be binding upon and inure to the benefit of the parties and their respective successors, heirs, executors, administrators and permitted assigns.

(k) **Interpretation**. Each party acknowledges that it has been represented by or had the opportunity to be represented by legal counsel in its review of this Agreement and that any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement or any amendments or exhibits hereto.

(l) **Survival of Terms**. All covenants, representations and warranties contained in this Agreement shall survive Closing. Those provisions in this Agreement which by their terms are intended to be or must be performed in whole or in part after the Closing or after termination of this Agreement shall survive Closing and the termination of this Agreement.

(m) **Headings**. The headings herein are inserted only for convenience and shall have no effect in interpreting the meaning of any provision.

(n) **Time is of the Essence**. Time is of the essence in this Agreement and each and every provision of this Agreement.

(o) **Notices**. All notices, approvals, disapprovals or elections required or permitted to be given under this Agreement shall be in writing and shall be (i) delivered personally; (ii) mailed by certified or registered mail, return receipt requested; (iii) sent by email transmission; (iv) sent by facsimile transmission; or (v) sent by Federal Express or other professional carrier, to the parties at the addresses listed below or at such other addresses as shall be designated by Optionee or Owner in writing. Except as expressly set forth in this Agreement, notices shall be deemed given upon delivery or tender of delivery to the intended recipient; provided, however, that (x) notice sent by email or facsimile shall only be deemed received when

both (A) the sender has electronic confirmation that it was sent to all parties (and has retained a confirmation of the delivery) and (B) at least one addressee entitled to notice for the applicable party has acknowledged receipt of the transmission; and (y) if a post office box is provided as the notice address, notice shall be deemed to have been given or made five (5) days after being deposited in the United States mail with appropriate postage prepaid. Copies of notices are for informational purposes only, and a failure to give or receive copies of any notice shall not be deemed a failure to give notice.

Owner Address

Maine Port Authority
Attn: Jon Nass, CEO
460 Commercial Street
Portland, ME 04101

Phone: 207-200-2400
E-mail: jon.nass@maineports.com

With a copy to:

Office of the Attorney General
Attn: Timothy Steigelman, AAG
6 State House Station
Augusta, ME 04333

Phone: 207-626-8509
E-mail: timothy.steigelman@maine.gov

Optionee Address

Attn: Thomas O'Shaughnessy
230 Park Avenue,
19th Floor
New York
10169
Phone: (347) 263-3213

With a copy to:

Attn: General Counsel
Amber Infrastructure Limited
3 More London Riverside
London, United Kingdom
SE1 2AQ

[SIGNATURE PAGE TO FOLLOW]

IN WITNESS WHEREOF, and intending to be bound hereby, the parties hereto have executed this Agreement on the date written above.

"**Owner**"

Maine Port Authority
a State of Maine "body both corporate and politic." 23 M.R.S. § 4420.

By: Jon Nass
Name: Jon Nass
Title: Chief Executive Officer

"**Optionee**"

Maine International Cold Storage Facility LLC,
a Delaware limited liability company

By: Tom O'Shaughnessy
Name: Tom O'Shaughnessy
Title: President

Exhibit A

Depiction of the Land
(entitled "Existing Conditions," "IMT WEST COLD STORAGE FACILITY," July 2015)

Exhibit B

Letter of Intent from Amber Infrastructure Group (January 27, 2020)

Exhibit C

Design-Build Agreement between Maine Port Authority Woodard & Curran Constructors, LLC
(Feb. 13, 2019, and as amended May 28, 2019)(without exhibits)

Exhibit D

Deed of Convenience
Book 36501, Page 146 (March 11, 2020)

3. FINANCIAL CAPACITY

3.1 ESTIMATED COSTS

The construction budget for the proposed development is $28,100,000.

3.2 FINANCING

A copy of a letter verifying the Applicant's financial capacity to undertake the project is attached to this Section.

3.3 CERTIFICATE OF GOOD STANDING

A copy of the Secretary of State's Certificate of Good Standing for Maine International Cold Storage Facility, LLC (the Applicant) is attached to this Section.

3.4 LIST OF ATTACHMENTS

- Financial Capacity Letter; and
- Certificate of Good Standing.

AMBER
INFRASTRUCTURE GROUP

Ms Christine Grimando
AICP Planning Director
Planning & Urban Development
Department 389 Congress Street 4thFloor
Portland
ME 04101

February 28, 2020

Re: the Maine International Cold Storage Facility ("MICSF")

Dear Ms. Grimando,

It is my pleasure to provide this letter confirming Amber Infrastructure Group's ("Amber") relationship with Maine International Cold Storage Facility LLC.

MICSF LLC is a wholly owned subsidiary of Amber and has been created as a Special Purpose Entity to undertake the development, financing, construction, ownership and operation of the proposed MICSF to be constructed in partnership with the Port Authority at the Portland Marine Terminal.

Amber is an international infrastructure developer and fund manager with over $8bn under management. Amber invests in eight countries internationally across six funds. Amber's core business focuses on sourcing, developing and investing in infrastructure sectors that support the lives of people, homes and businesses internationally.
Amber is headquartered in London with offices in Europe, North America and Australia and employs approximately 125 infrastructure professionals.

I have attached Amber's latest set of annual audited accounts for your review. These demonstrate our available cash resources which exceed £107m ($139m) which exceed the anticipated financing requirement of the development and financing of the MICSF.

Should you require any further information please do not hesitate to contact me.

Yours sincerely



Tom O'Shaughnessy, President, Amber Infrastructure LLC

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "MAINE INTERNATIONAL COLD STORAGE FACILITY LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE TWENTY-SEVENTH DAY OF FEBRUARY, A.D. 2020.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "MAINE INTERNATIONAL COLD STORAGE FACILITY LLC" WAS FORMED ON THE TWENTY-SEVENTH DAY OF FEBRUARY, A.D. 2020.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE BEEN ASSESSED TO DATE.

Jeffrey W. Bullock, Secretary of State

7873797 8300

Authentication: 202476888

SR# 20201654726

Date: 02-27-20

You may verify this certificate online at corp.delaware.gov/authver.shtml

4. TECHNICAL ABILITY

On behalf of the Applicant, Woodard & Curran is preparing this application for the proposed development. Woodard & Curran has extensive experience with design for site development projects and specifically on the peninsula within the City of Portland. Woodard & Curran, a 1,000-person Portland-based firm, has provided engineering services to the public and private sector for over 40 years, including permitting, civil/site engineering, stormwater and construction management services.

Woodard & Curran has been involved in numerous development projects in the Greater Portland Area and has developed working relationships with various consultants who are called upon, as necessary, to provide specialized services. The project is also supported by a design team including CWS Architects, Pat Carroll Landscape Architects, Thornton Tomasetti Structural Engineers and Bartlett Electrical Engineering. Copies of resumes or project examples can be provided upon request.

5. NOISE

An acoustic study was performed for the proposed refrigeration facility. The study is summarized in the Noise Modeling Analysis Report by Tech Environmental dated February 25, 2020 attached to this Section. The acoustic modeling included thirty-two residential receptors and three property line receptors. Two modeling scenarios were performed: daytime, which consisted of twenty refrigerated trucks and one condenser, and nighttime, which consisted of ten refrigerated trucks and one condenser.

The results of the acoustic study were compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy. One-third octave bands were not available for the equipment data used in the model, so as per Maine DEP regulations a 5-dBA penalty was added to the predicted project sound levels. The pre-existing sound levels are in the 50-60 dBA range for daytime and nighttime sound levels. The study demonstrates that project operations will not cause an increase in the existing sound levels. Tables 2 in the letter report presents the results from the model and demonstrate that the project will comply with the Maine DEP 06-096 Chapter 375 (10) Control of Noise.

Construction activities will be limited to the hours permitted by the City. HVAC and primary mechanical equipment will be located and screened to mitigate noise impacts.

5.1 LIST OF ATTACHMENTS

- Noise Modeling Analysis prepared by Tech Environmental

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

February 25, 2020

Mr. Jedd Steinglass, LSP
Project Manager
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

Ref 4496

Re: Noise Modeling Analyses for SLODA- Compliance Demonstration

Dear Mr. Steinglass:

This letter report presents the results of an acoustic study for the proposed refrigeration facility located at 40 West Commercial Street, Portland, Maine (herein referred to as the Project). The proposed project is a total of 125,572 square feet, with 12 loading docks. The current Project location is a vacant lot that is located in a waterfront port development zone.

The acoustic modeling includes 32 residential receptors, and 3 property line receptors. Two modeling scenarios were performed:

1. daytime: which consists of up to 20 refrigerated trucks, 1 outdoor condenser, and
2. nighttime: which consists of having 10 refrigerated trucks, 1 outdoor condenser.

One-third octave bands were not available for the equipment data used in the model, so as per Maine DEP regulations a 5 dBA penalty was added to the predicted project sound levels.

The results of the acoustic study were compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy and the City of Portland Zoning Bylaw. **Tables 1** and **2** present the results from the model and demonstrate that the Proposed Project will comply with both the Maine DEP Noise Policy and the City of Portland Code of Ordinance.

1.0 THE DECIBEL SCALE FOR SOUND

All sounds originate with a source – a human voice, vehicles on a roadway, or an airplane overhead. The sound energy moves from the source to a person's ears as sound waves, which are minute variations of air pressure. The loudness of a sound depends on the sound pressure level, which has units of decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. On this scale, the quietest sound we can hear is 0 dB, while the loudest is 120 dB. Every 10-dB increase is perceived as a doubling of loudness. Most sounds we hear in our daily lives have sound pressure levels in the range of 30 dB to 90 dB.

Community noise studies and regulations use an A-weighting scale (dBA) when measuring sound pressure levels as this approximates the response of the human ear to sounds, we experience in everyday life. Typical sound levels associated with various activities and environments are presented in **Figure 1**. Here are examples of sound levels we all encounter. A quiet suburban area at night without any traffic typically has an average sound level of 40 to 45 dBA. The freight train you hear in the distance may be 50 dBA, and crickets and tree frogs in the summer sing a sound level of 55 dBA. Two people having a conversation in a normal tone of voice will hear each other speak at 65 dBA. Standing near a road, a car passing by can produce 75 dBA, and a truck passing by is louder at 80 dBA.

There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L_{90} metric, which is the sound level exceeded 90 percent of the time, is typically used. The L_{90} can also be thought of as the level representing the quietest 10 percent of any time period. The L_{10} metric, which is the sound level exceeded 10 percent of the time is typically used to assess transient noise highway or rail activities. The L_{eq}, or equivalent sound level, is the steady-state sound level over a period of time that has the same acoustic energy as the fluctuating sounds that actually occurred during that same period. It is commonly referred to as the average sound level. The L_{max}, or maximum sound level, represents the one second peak level experienced during a given time period. These are a broadband sound pressure measure, i.e., it includes sounds at all frequencies.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines eleven octave bands from 16 to 16,000 Hz.

2.0 APPLICABLE NOISE REGULATIONS

This section provides a summary of the Maine Department of Environmental Protection (Maine DEP) Noise Policy and the City of Portland Code of Ordinace.

2.1 Maine Department of Environnemental Protection Noise Policy

The Maine Department of Environmental Protection (Maine DEP) 06-096 Chapter 375 (10) Control of Noise. There are three criteria that could apply, the first is at the industrial fenceline, Chapter 375 (10) (1) (a) (i), and the second is at the fenceline of the residential locations, Chapter 375 (10) (1) (a) (ii). Both of these assume that the background is less than these limits. If the background is great than these limits because of existing background sound then the limit for the industrial fenceline, the residential fenceline, or possibly both could be an incremental increase Chapter 375 (10).

> *(1)(a)(i) At any property line of the development or contiguous property owned by the developer, whichever is farther from the proposed development's regulated sound sources:*
>
> *75 dBA at any time of day.*

(1)(a)(ii) At any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is not predominantly commercial, transportation, or industrial;

60 dBA between 7:00 a.m. and 7:00 p.m.
(the "daytime hourly limit"), and
50 dBA between 7:00 p.m. and 7:00 a.m.
(the "nighttime hourly limit").

Tech was provided with the "City of Portland Baseline Sound Monitoring Report" which included sound measurements taken near the project site, at Location: 10- Casco Bay Bridge, where the lowest measured day time and night time sound levels were 66 dBA and 57 dBA respectively. Location 3- Fore and Union, is a representative location for the residential area and the lowest measured day and nighttime sound levels where 60 DBA and 54 dBA.

Based on the provided Maine regulations "Notwithstanding the above, the developer need not measure or estimate the pre-development ambient hourly sound levels at a protected location if he demonstrates, by estimate for example, that the hourly sound levels resulting from routine operation of the development will not exceed 50 dBA in the daytime or 40 dBA at night" The pre- existing background of the project location and residential area are above 50 dBA (day) and 40 dBA (night). Which demonstrates that the developer does not need to take measurements and instead can used the limits presented in Chapter 375 (10) stated above.

2.2 City of Portland Code of Ordinace

The Project is located in a zoning area labeled as waterfront port development. The City of Portland Code of Ordinace Chapter 14 Sec. 14-320.3 states the following:

All uses in the waterfront port development zone shall comply with the following standards.

(b) Noise:

1. The level of sound, measured by a sound level meter with frequency weighting network (manufactured according to standards prescribed by the American National Standards Institute, Inc.), inherently and recurrently generated within the waterfront port development zone between the hours of 7:00 p.m. and 7:00 a.m. from industrial facilities or operation commenced on or after July 1, 1988, shall not exceed fifty-five (55) decibels on the A scale at or within the boundaries of any residential zone, except for sound from construction activities, sound from traffic on public streets, sound from temporary activities such as festivals, and sound created as a result of, or relating to, an emergency, including sound from emergency warning signal devices.

To comply with the City of Portland Code of ordinance the proposed project predicted sound levels cannot exceed fifty-five (55) decibels on the A scale at or within the boundaries of any residential zone.

3.0 ACOUSTIC MODELING APPROACH AND RESULTS

This section provides a summary of the acoustic modeling approach and results.

3.1 Acoustic Modeling Approach

The future sound levels from the Project, when it is producing maximum electrical power, were calculated with the Cadna/A acoustic model. Cadna/A is a three-dimensional model for sound propagation and attenuation based on International Standard ISO 9613[1]. Atmospheric absorption, the process by which sound energy is absorbed by the air, was calculated using ANSI S1.26-1995.[2] Digital terrain data for the Project areas were analyzed to obtain terrain heights. The model assumes the most-favorable sound propagation conditions, as occur under downwind conditions or during a ground-based temperature inversion on a clear night. Under these atmospheric conditions, sound travels further than if a person is upwind from a source and the atmosphere is well mixed, which would dampen the sound. Tech used refrigerated truck sound data from past noise projects to model twenty (20) refrigerated trucks for the daytime, and ten (10) refrigerated trucks during the nighttime, and was provided sound data to model one (1) condenser. A safety factor of 2 dBA was added onto each sound source.

Figure 2 shows modeling receptors included in Cadna/A representing both the residential and property line receptors.

3.2 Acoustic Modeling Results

Presented in this section is the predicted daytime and night sound levels for the Project and a comparison of compliance to the Maine DEP Noise Policy and Portland Noise Bylaw. Attachment A presents the acoustic modeling results.

Table 1 presents the predicted project daytime and nighttime sound levels, and one-third octave bands were not available for the equipment data used in the model, as per Maine DEP regulations a 5 dBA penalty was added to the predicted project sound levels. The predicted sound level increases were zero decibels above daytime and nighttime sound levels limits. The predicted project sound levels compared to the City of Portland noise limits are presented in **Table 2**, the predicted sound level increases were zero decibels above daytime and nighttime sound level limits.

Decibel-level contour maps of the predicted Project daytime and nighttime sound levels are presented in **Figures 3 and 4**.

[1] International Standard, ISO 9613-2, Acoustics – Attenuation of Sound During Propagation Outdoors, -- Part 2 General Method of Calculation.
[2] American National Standards Institute, ANSI S1.26-1995, "American National Standard Method for the Calculation of the Absorption of Sound by the Atmosphere," 1995.

Table 1:
Predicted Project Sound Levels Compliance with Maine DEP Noise Limits

Receptor #	Address	Predicted Project Sound Levels (dBA)		Predicted Project Sound Levels (dBA) with additionial 5 dBA for Tonal Sound		Maine DEP Noise Limits (dBA)		Compliance	
		Day	Night	Day	Night	Day	Night	Day	Night
1	65 Summer St 1FL	34	33	39	38	60	50	Yes	Yes
2	65 Summer St 2FL	34	33	39	38	60	50	Yes	Yes
3	51 Summer St 1FL	34	33	39	38	60	50	Yes	Yes
4	51 Summer St 2FL	34	33	39	38	60	50	Yes	Yes
5	49 Summer St 1FL	34	32	39	37	60	50	Yes	Yes
6	49 Summer St 2FL	34	33	39	38	60	50	Yes	Yes
7	45 Summer St 1FL	32	30	37	35	60	50	Yes	Yes
8	45 Summer St 2FL	33	32	38	37	60	50	Yes	Yes
9	33 Summer St 1FL	30	28	35	33	60	50	Yes	Yes
10	33 Summer St 2FL	31	29	36	34	60	50	Yes	Yes
11	28 Summer St 1FL	28	26	33	31	60	50	Yes	Yes
12	28 Summer St 2FL	29	27	34	32	60	50	Yes	Yes
13	265 York St 1FL	29	27	34	32	60	50	Yes	Yes
14	265 York St 2FL	32	30	37	35	60	50	Yes	Yes
15	78 Salem St 1FL	32	31	37	36	60	50	Yes	Yes
16	78 Salem St 2FL	33	32	38	37	60	50	Yes	Yes
17	82 Salem St 1FL	34	33	39	38	60	50	Yes	Yes
18	82 Salem St 2FL	35	35	40	40	60	50	Yes	Yes
19	90 Salem St 1FL	33	32	38	37	60	50	Yes	Yes
20	90 Salem St 2FL	34	33	39	38	60	50	Yes	Yes
21	84R Salem St 1FL	31	30	36	35	60	50	Yes	Yes
22	84R Salem St 2FL	32	32	37	37	60	50	Yes	Yes
23	88 Salem St 1FL	31	29	36	34	60	50	Yes	Yes
24	88 Salem St 2FL	32	32	37	37	60	50	Yes	Yes
25	263 York St 1FL	29	27	34	32	60	50	Yes	Yes
26	263 York St 2FL	31	29	36	34	60	50	Yes	Yes
27	259 York St 1FL	28	26	33	31	60	50	Yes	Yes
28	259 York St 2FL	30	28	35	33	60	50	Yes	Yes
29	251 York St 1FL	28	26	33	31	60	50	Yes	Yes
30	251 York St 2FL	29	27	34	32	60	50	Yes	Yes
31	24 Brackett St 1FL	28	26	33	31	60	50	Yes	Yes
32	24 Brackett St 2FL	30	27	35	32	60	50	Yes	Yes
33	Property Line Receptor 1	56	56	61	61	75	75	Yes	Yes
34	Property Line Receptor 2	42	39	47	44	75	75	Yes	Yes
35	Property Line Receptor 3	69	64	74	69	75	75	Yes	Yes

Table 2:
Predicted Project Sound Levels Compliance with City of Portland Noise Limits

Receptor #	Address	Predicted Project Sound Levels (dBA)		City of Portland Noise Limits (dBA)		Compliance	
		Day	Night	Day	Night	Day	Night
1	65 Summer St 1FL	34	33	55	55	Yes	Yes
2	65 Summer St 2FL	34	33	55	55	Yes	Yes
3	51 Summer St 1FL	34	33	55	55	Yes	Yes
4	51 Summer St 2FL	34	33	55	55	Yes	Yes
5	49 Summer St 1FL	34	32	55	55	Yes	Yes
6	49 Summer St 2FL	34	33	55	55	Yes	Yes
7	45 Summer St 1FL	32	30	55	55	Yes	Yes
8	45 Summer St 2FL	33	32	55	55	Yes	Yes
9	33 Summer St 1FL	30	28	55	55	Yes	Yes
10	33 Summer St 2FL	31	29	55	55	Yes	Yes
11	28 Summer St 1FL	28	26	55	55	Yes	Yes
12	28 Summer St 2FL	29	27	55	55	Yes	Yes
13	265 York St 1FL	29	27	55	55	Yes	Yes
14	265 York St 2FL	32	30	55	55	Yes	Yes
15	78 Salem St 1FL	32	31	55	55	Yes	Yes
16	78 Salem St 2FL	33	32	55	55	Yes	Yes
17	82 Salem St 1FL	34	33	55	55	Yes	Yes
18	82 Salem St 2FL	35	35	55	55	Yes	Yes
19	90 Salem St 1FL	33	32	55	55	Yes	Yes
20	90 Salem St 2FL	34	33	55	55	Yes	Yes
21	84R Salem St 1FL	31	30	55	55	Yes	Yes
22	84R Salem St 2FL	32	32	55	55	Yes	Yes
23	88 Salem St 1FL	31	29	55	55	Yes	Yes
24	88 Salem St 2FL	32	32	55	55	Yes	Yes
25	263 York St 1FL	29	27	55	55	Yes	Yes
26	263 York St 2FL	31	29	55	55	Yes	Yes
27	259 York St 1FL	28	26	55	55	Yes	Yes
28	259 York St 2FL	30	28	55	55	Yes	Yes
29	251 York St 1FL	28	26	55	55	Yes	Yes
30	251 York St 2FL	29	27	55	55	Yes	Yes
31	24 Brackett St 1FL	28	26	55	55	Yes	Yes
32	24 Brackett St 2FL	30	27	55	55	Yes	Yes

4.0 CONCLUSION

Tech performed an acoustic modeling study for the proposed refrigeration facility located at 40 West Commercial Street. The future sound levels from the Project, were calculated with the Cadna/A acoustic model. The model included twenty (20) refrigerated trucks for the daytime, and ten (10) refrigerated trucks during the nighttime, and one (1) condenser; and 32 residential receptors, and 3 property line receptors. One-third octave bands were not available for the equipment data used in the model, so as per Maine DEP regulations a 5 dBA penalty was added to the predicted project sound levels.

The study demonstrated that because the pre-existing sound levels are in the 50-60 dBA range for day time and nighttime sound levels, the Project operations will not cause an increase in the existing sound levels. The results of the acoustic study were then compared to the Maine Department of Environmental Protection (Maine DEP) Noise Policy and the City of Portland Zoning Bylaw. If Project includes the equipment that were modeled and the surrounding area does not have a pre-existing tonal sound, there would be no observed tonal sounds predicted at the site property lines or the residential receptors. Therefore, the Projects will comply with both the Maine DEP Noise Policy and the City of Portland Code of Ordinace.

Please call if you have any questions regarding this report.

Sincerely,

TECH ENVIRONMENTAL, INC.



Michael T. Lannan, P.E.
President
4496/ Letter Report December 2019

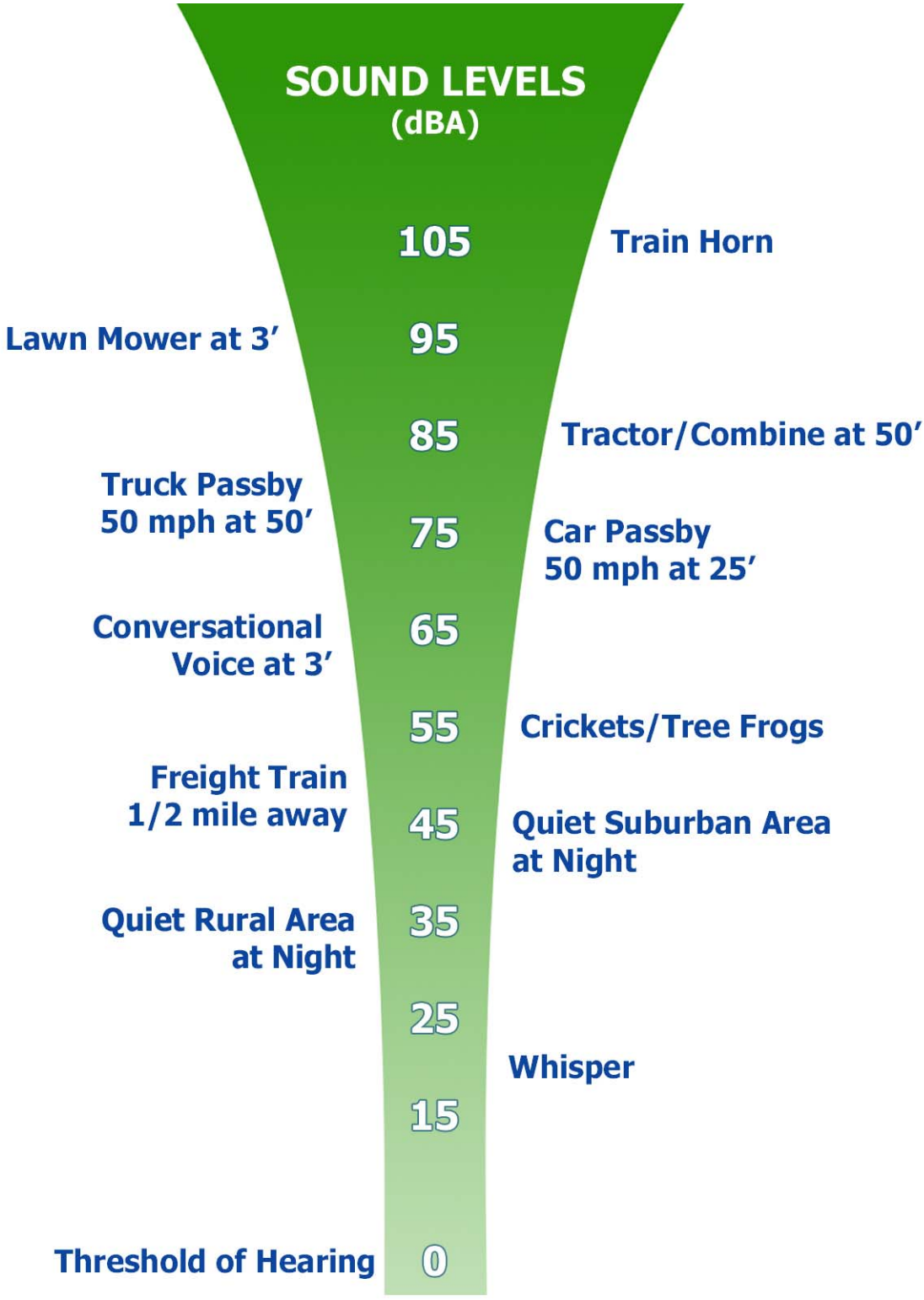


FIGURE 1.
Common Outdoor Sound Levels

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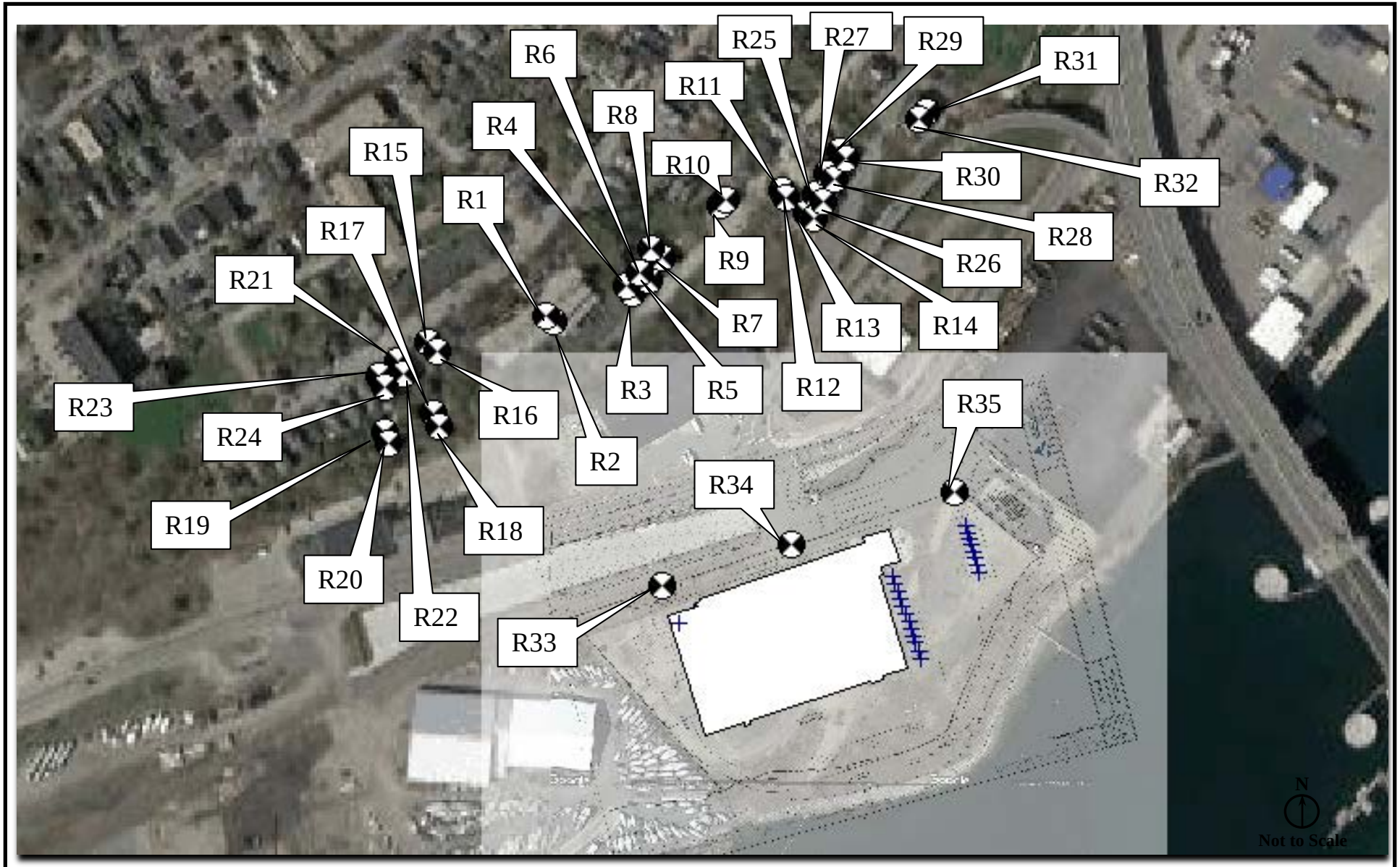

FIGURE 2.
Modeling Receptors Location
40 West Commercial Street, Portland, ME

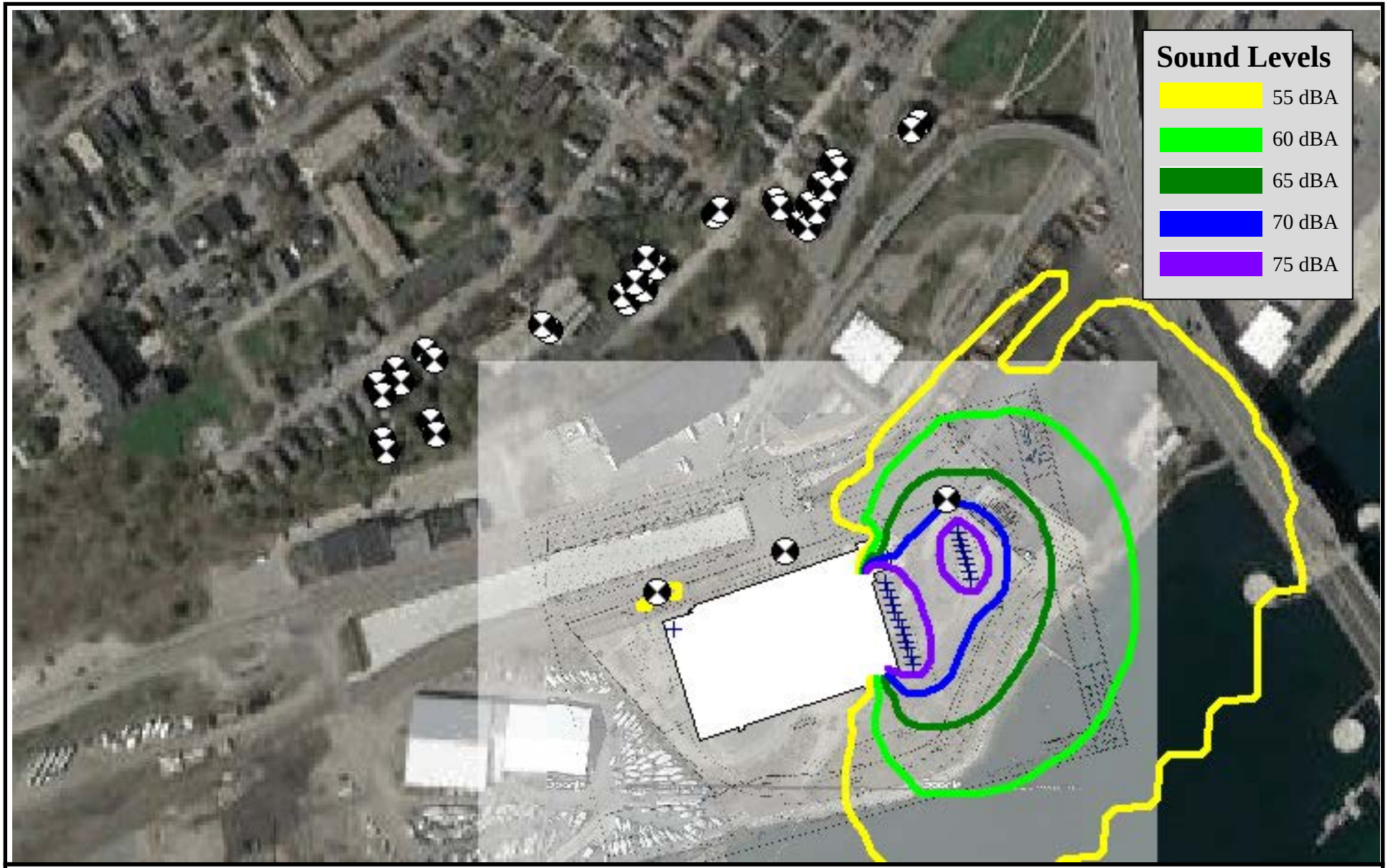

FIGURE 3.
Daytime Predicted Sound Levels
40 West Commercial Street, Portland, ME

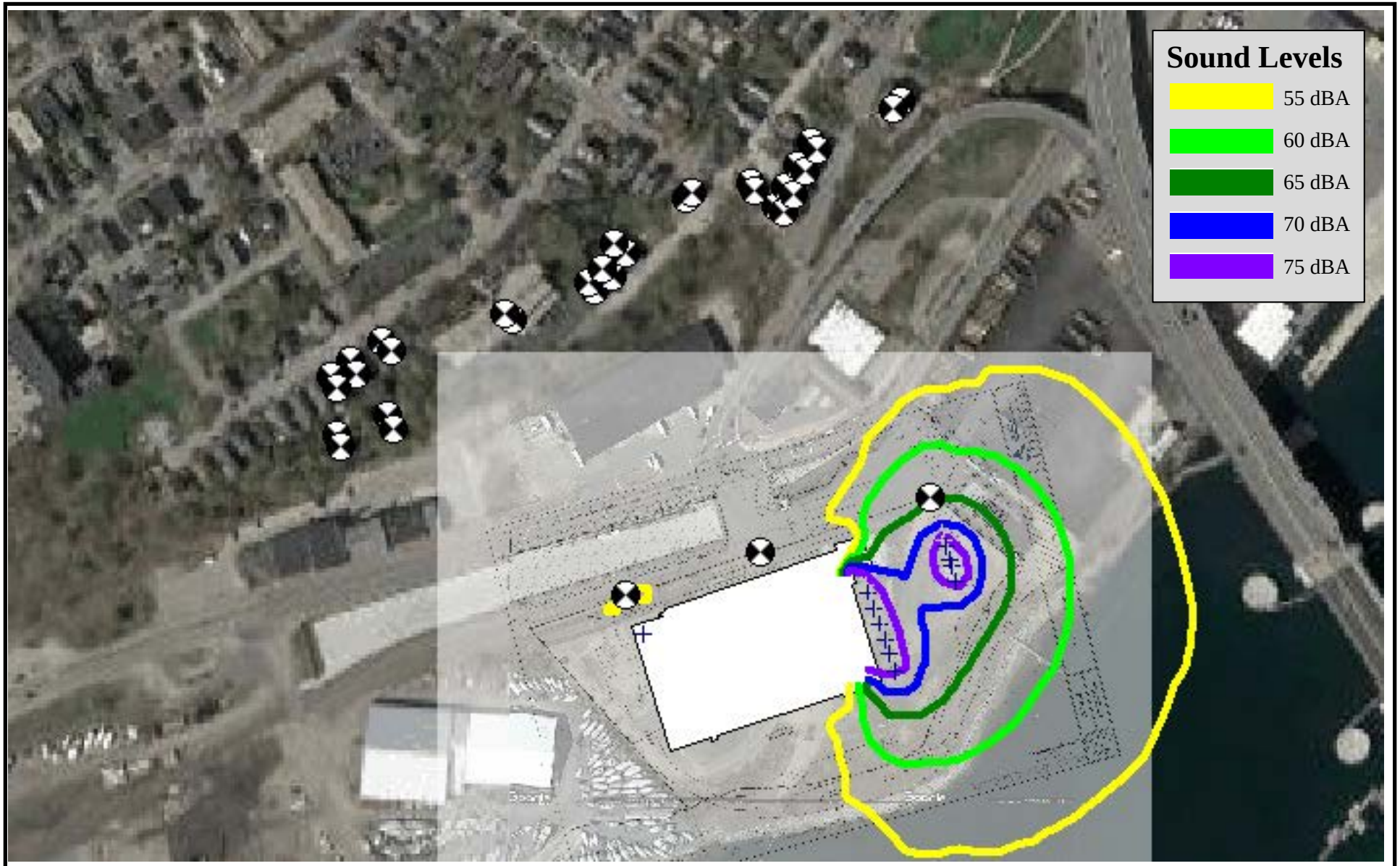

FIGURE 3.
Nighttime Predicted Sound Levels
40 West Commercial Street, Portland, ME

6. VISUAL QUALITY & SCENIC CHARACTER

As further described in the City of Portland Site Plan Application for the proposed development, the architecture and landscaping have been designed to be consistent with the scenic character of the surrounding urban waterfront area. The Site Plan Application includes renderings of the proposed development. It is not anticipated that the proposed development will result in any negative visual impacts.

7. WILDLIFE & FISHERIES

The Site has been previously developed and there are no known areas of significant natural features, including areas of significant wildlife habitats or wetlands. The attached Official Species List identifies the northern long-eared bat, which has been listed as a Federally Threatened Species, in association with the project area; however, there are no critical habitat areas located within the project area. Based on US Fish & Wildlife information, the northern long-eared bat typically lives in caves during the winter months and in trees larger than three inches in diameter during the summer, with migration between these two habitats in the spring in the fall. The project is located in an existing urban, developed area and no trees meeting the criteria for bat habitat are proposed to be impacted by the project. It is not anticipated that the proposed development will have a negative impact on the northern long-eared bat.

A letter has been sent to the Maine Department of Inland Fisheries and Wildlife (MDIFW) requesting information regarding any known threatened or endangered species or critical habitat relative to the project area; a copy of this letter is attached to this Section for your reference. A copy of the MDIFW response can be provided upon receipt.

7.1 LIST OF ATTACHMENTS

- Official Species List; and
- MDIFW Environmental Review Request Letter.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: February 24, 2020
Consultation Code: 05E1ME00-2020-SLI-0741
Event Code: 05E1ME00-2020-E-02460
Project Name: MPA Cold Storage Facility

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2020-SLI-0741

Event Code: 05E1ME00-2020-E-02460

Project Name: MPA Cold Storage Facility

Project Type: DEVELOPMENT

Project Description: Proposed development located at 40 West Commercial Street in Portland, ME.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.64488761927891N70.2617886507607W



Counties: Cumberland, ME

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, ME 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

February 28, 2020

Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333

RE: Maine International Cold Storage Facility – Environmental Review Request

To Whom It May Concern:

Maine Port Authority is proposing to construct a cold storage facility on a 17.9-acre property located at 40 West Commercial Street in Portland, Maine. The project site was previously developed, but is currently vacant, with remnant concrete slabs and pavements, site lights, transformer pads, railroad tracks and gravels. The proposed project will include construction of an approximately 108,000 square foot building with a truck parking and loading area, employee parking lot, emergency access drive and associated site improvements.

The proposed work will require a Maine Department of Environmental Protection Site Location of Development Permit, which requires coordination with the Maine Department of Inland Fisheries and Wildlife (MDIFW). On behalf of Maine Port Authority, we are requesting a review of the project area for any known threatened or endangered species or critical habitat. A Site Location Map and Site Plan have been attached for your reference.

We appreciate your review of this project. If you have any questions regarding this information or the proposed project, please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com. Thank you for your assistance.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) Site Location Map
Site Plan

PN: 0232277.00

8. HISTORIC SITES

A letter has been sent to the Maine Historic Preservation Commission (MHPC) requesting a review of the project area relative to historic properties; a copy of this letter is attached to this Section for your reference. A copy of the MHPC response can be provided upon receipt.

8.1 LIST OF ATTACHMENTS

- MHPC Project Review Request Letter.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, ME 04102
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

February 28, 2020

Kirk F. Mohney, Director
Maine Historic Preservation Commission
55 Capitol Street, 65 State House Station
Augusta, Maine 04333-0065

Re: Maine International Cold Storage Facility – Project Review Request

Dear Mr. Mohney:

Maine Port Authority is proposing to construct a cold storage facility on a 17.9-acre property located at 40 West Commercial Street in Portland, Maine. The project site was previously developed, but is currently vacant, with remnant concrete slabs and pavements, site lights, transformer pads, railroad tracks and gravels. The proposed project will include construction of an approximately 108,000 square foot building with a truck parking and loading area, employee parking lot, emergency access drive and associated site improvements.

The proposed work will require a Maine Department of Environmental Protection Site Location of Development Permit, which requires coordination with the Maine Historic Preservation Commission. On behalf of Maine Port Authority, we are requesting a review of the project area for any known historic properties. The proposed project is not located within or adjacent to a City of Portland Historic Preservation District. A USGS topographic map has been attached for your reference.

We appreciate your review of this project. If you have any questions regarding this information or the proposed project, please do not hesitate to contact me at (207)558-3662 or dstairs@woodardcurran.com. Thank you for your assistance.

Sincerely,

WOODARD & CURRAN

Darrin Stairs, P.E.
Project Manager

Enclosure(s) USGS Map

PN: 0232277.00

9. UNUSUAL NATURAL AREAS

The Site has been previously developed and there are no known unusual natural areas. A letter was sent to the Maine Natural Areas Program (MNAP) requesting a review of the Site relative to rare and exemplary botanical features. A response letter was received from MNAP confirming there are no rare or significant botanical features within the project area; a copy of this letter is attached to this Section.

9.1 LIST OF ATTACHMENTS

- MNAP Site Review Response Letter.

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

March 10, 2020

Darrin Stairs
Woodard & Curran
41 Hutchins Drive
Portland, ME 04102

Via email: dstairs@woodardcurran.com

Re: Rare and exemplary botanical features in proximity to: #0232277.00, Maine International Cold Storage Facility, Portland, Maine

Dear Mr. Stairs:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received February 28, 2020 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Portland, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
90 BLOSSOM LANE, DEERING BUILDING

PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

The Maine Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov

10. BUFFERS

The Site has been previously developed. There are no existing or proposed buffers. This Section is not applicable.

11. SOILS

Copies of the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey and the Geotechnical Report prepared for the Site are attached to this Section for your reference. Environmental assessments of the Site have been conducted and the Owner is a participant in the Maine Department of Environmental Protection Voluntary Response Action Program (VRAP) as described in greater detail in Section 18 of this report. The existing soil management plan will be revised for the site in accordance with the Maine DEP VRAP No Action Assurance Letter (NAAL).

11.1 LIST OF ATTACHMENTS

- United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey; and
- Geotechnical Report.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine



February 19, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


70° 15' 52" W
70° 15' 32" W
43° 38' 46" N
43° 38' 37" N
398020
398060
398100
398140
398180
398220
398260
398300
398340
398380
398420
398460
4833360
4833320
4833280
4833240
4833200
4833160
4833120
4833080
1 Alt
Ramp
1
Cu
W
W
W
Soil Map may not be valid at this scale.
Map Scale: 1:2,080 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
30
60
120
180
Feet
0
100
200
400
600
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 16, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cu	Cut and fill land	12.0	97.9%
W	Water	0.3	2.1%
Totals for Area of Interest		**12.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

Cu—Cut and fill land

Map Unit Setting

National map unit symbol: blh4
Elevation: 10 to 2,200 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 70 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Cut and fill land: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cut And Fill Land

Typical profile

H1 - 0 to 65 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 35 percent
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 20.00 in/hr)
Depth to water table: About 24 to 42 inches
Available water storage in profile: Moderate (about 6.6 inches)

Minor Components

Windsor

Percent of map unit: 2 percent
Landform: Outwash terraces, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Elmwood

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hollis

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: No

Tidal marsh

Percent of map unit: 2 percent
Landform: Tidal flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Buxton

Percent of map unit: 2 percent
Landform: Coastal plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Setting

Landform: Lakes

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United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

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COMMITMENT & INTEGRITY
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Via Electronic Mail

April 30, 2018

Matt Burns
Executive Director
Maine Port Authority
16 State House Station
Augusta, ME 04333-0016

Re: Preliminary Geotechnical Survey and Foundation System Recommendations
Proposed Cold Storage Facility, Portland IMT

Dear Matt:

This letter report describes the work completed by Woodard & Curran to provide information relative to geotechnical conditions at the cold storage development site and how these conditions may impact the type of foundation that is appropriate to support the proposed building.

The following sections describe the work that was completed to evaluate conditions relative to the various engineering disciplines applicable to the project, as well as the resulting recommended preliminary foundation design concept and associated estimated construction cost.

Please note that the information contained in this letter report is based solely on the limited investigation conducted at the project site and basic design details provided by Americold Logistics, LLC (Americold) in their September 9, 2016, Request for Proposal (RFP). Therefore, the findings presented herein must be considered preliminary in nature and are not appropriate for use in construction without verification during the building design phase of the project.

Background

Consistent with our direct experience at the cold storage facility development site, existing geology may present an unacceptable risk of total and differential post-construction building and slab settlement, which could result in slab/foundation failure if a soil-supported foundation system and slab-on-grade is constructed at the site. Conversely, we understand that the premium costs associated with the design and construction of a deep pile-supported foundation system have the potential to impact the financial feasibility of the project as well as the lease terms with the developer. Therefore, Woodard & Curran investigated subsurface conditions at the site to determine the feasibility of supporting the building using a conventional shallow spread footing foundation system, evaluated several alternative foundation systems, and estimated the potential cost premiums of the alternative systems relative to the foundation design provided by Americold in their September 9, 2016, RFP.

Preliminary Geotechnical Investigation

Field Program

Between December 18 and 27, 2017, Woodard & Curran and our project partner, S.W. Cole, completed five test borings at the site and one additional boring that was abandoned due to refusal. Boring locations are presented on the Exploration Location Plan, which is included in **Attachment A**.

The borings encountered up to 20 feet of fill over up to 10 feet of bay mud over native deposits of glaciomarine clay overlying outwash sands. At the borings nearest West Commercial Street (B-1001 and B-1002), the glaciomarine clay was thin to non-existent and the outwash sands started at approximately 24 feet below ground surface (bgs). At the borings in the center of the site (B-1003) and nearest the Fore River (B-1004 and B-1005), the glaciomarine clays were encountered at depths of 24 to 29 feet bgs extended to depths of approximately 69 feet bgs overlying the outwash sands. Each of the five borings was terminated in the outwash sands.

Groundwater was observed at 4 to 8 feet bgs at the time of drilling. Below-grade obstructions, interpreted to represent relic concrete foundations and slabs, were encountered at several boring locations.

Samples collected during the advancement of the soil borings were analyzed by S.W. Cole for gradation and consolidation. In addition, concurrent with the subsurface exploration program, Hager-Richter completed Shear Wave Velocity Testing on three seismic lines over the building footprint.

Conclusions

The subsurface conditions at the site are variable with fill over bay mud over glaciomarine clays over outwash sands. The glaciomarine clay is of varying thickness, stiffness, and compressibility (normally consolidated to slightly overconsolidated). Soil boring logs and results of gradation and consolidation testing are included as **Attachment B**.

Results of the shear wave velocity testing classified the site as Seismic Site Class D per the 2015 International Building Code (IBC). The Shear Wave Velocity Testing report is included as **Attachment C**.

Consistent with conditions observed during drilling and subsequent laboratory testing, and the preliminary building design plus anticipated storage rack loads provided by Americold in their September 9, 2016, RFP, constructing the proposed building on a shallow soil supported foundation would likely trigger an unacceptable degree of differential settlement. In other words, the shallow soil supported foundation proposed in the September 9, 2016, RFP is unlikely to be adequate and may result in damage to the building slab and/or the building itself.

A graphic that models the varying degrees of potential settlement that could be anticipated across a shallow soil supported building using the preliminary design parameters described above is included as **Attachment D**.

Based on these conditions, the shallow soil supported foundation option was found to be infeasible for the development of the site and several alternative design options were generated. These options are discussed below.

Evaluation of Alternative Foundations

Following the completion of the preliminary geotechnical investigation, Woodard & Curran and our project partners S.W. Cole and Becker Structural Engineers evaluated three different design alternative categories:

1. Hybrid of rigid inclusion ground improvement across the entire building footprint with removal of existing fill and replacement with low density lightweight fill material.

2. Rigid inclusion ground improvement (e.g., aggregate piles terminating in outwash sands) across the entire building footprint with spread footings and an on-grade structural floor slab with normal weight fill.

3a. Deep displacement closed end pipe piles terminating in outwash sands with pile caps, grade beams, and a structural floor slab.

3b. Deep end-bearing H-piles terminating at bedrock with pile caps, grade beams, and a structural floor slab.

Following the identification of the foundation alternatives, Woodard & Curran developed budgetary estimates of probable cost for each option. To the greatest extent possible, each budgetary cost estimate was focused to quantify the cost premium associated with the necessary ground improvements above and beyond what could be anticipated to construct the building presented in Americold's September 9, 2016, RFP.

These estimates describe the expected budgetary labor, materials, and general conditions costs for standard construction divisions as informed by preliminary site and grading, geotechnical, and structural designs.

A table that summarizes the engineering and design considerations as well as the estimated cost for each option is presented below. Schematic descriptions of the alternatives are included as **Attachment E** and budgetary cost estimate summaries are included as **Attachment F**.

Table 1: Foundation Alternative Considerations Matrix					
Alternative	**Structural Considerations**	**Civil Considerations**	**Environmental Considerations**	**Other Considerations**	**Budgetary Cost Range**
1. Hybrid of rigid inclusion and lightweight fill <u>Details:</u> Sketch: Refer to Attachment B, Sheet 1 Costs: Refer to Attachment C, Option 1	Could allow a less robust structural slab and ground improvement density, reducing cost.	Removal of existing fill material would likely increase earthwork costs.	Approximately 33,600 tons of fill material that is likely contaminated would need to be managed and disposed to install the lightweight fill, likely increasing environmental costs.	• Could possibly eliminate sub-slab heating system due to the insulating properties of lightweight fill material, reducing operational costs. • Subsurface obstructions could interfere with the installation of rigid inclusions.	$8,710,000 to $10,017,000
2. Rigid inclusion and normal weight fill <u>Details:</u> Sketch: Refer to Attachment B, Sheet 2 Costs: Refer to Attachment C, Option 2	Foundation construction materials would likely be similar in cost to the RFP design; however, labor costs are likely to increase.	Additional earthwork would be required to install the structural slab design, likely increasing earthwork costs.	Approximately 26,700 tons of fill material that is likely contaminated would need to be managed and disposed due to the foundation design, likely increasing environmental costs.	• Installation of rigid inclusions does not appear to create a significant risk of mobilization of contaminants, but additional study would be needed to confirm. • Subsurface obstructions could interfere with the installation of rigid inclusions.	$6,412,000 to $7,374,000
3a. Deep displacement pipe piles <u>Details:</u> Sketch: Refer to Attachment B, Sheet 3 Costs: Refer to Attachment C, Option 3a	Foundation construction materials and labor costs would likely increase relative to RFP design.	Additional earthwork would be required to install grade beams and pile caps, likely increasing earthwork costs.	Approximately 3,600 tons of fill material that is likely contaminated would need to be managed and disposed due to the foundation design, likely increasing environmental costs.	• Installation of rigid inclusions does not appear to create a significant risk of mobilization of contaminants, but additional study would be needed to confirm. • Subsurface obstructions could interfere with the installation of pipe piles.	$6,397,000 to $7,357,000
3b. Deep end-bearing H-piles <u>Details:</u> Sketch: Refer to Attachment B, Sheet 3 Costs: Refer to Attachment C, Option 3b	Foundation construction materials and labor costs would likely increase relative to RFP design.	Additional earthwork would be required to install grade beams and pile caps, likely increasing earthwork costs.	Approximately 3,600 tons of fill material that is likely contaminated would need to be managed and disposed due to the foundation design.	H-piles would represent the lowest risk of mobilization of contaminants and would also be least likely to experience interference from subsurface obstructions.	$5,515,000 to $6,342,000

Recommended Alternative Foundation System Design and Next Steps

Following the completion of our evaluation, Woodard & Curran has identified a deep end-bearing H-pile system terminating at bedrock with pile caps, grade beams, and a structural floor slab as the design alternative that meets the technical requirements of the project and is likely to be the most cost-effective approach to implement. In addition, this design is least likely to result in the mobilization of existing site contamination and is least likely to experience interference from potential subsurface structures. Therefore, this option may offer a lower risk of potential unforeseen conditions that could impact cost and schedule.

Consistent with our findings, this design option would increase the construction cost of the building described in Americold's September 9, 2016, RFP by approximately $5,515,000 to $6,342,000.

To continue to move this project towards implementation, we recommend the Maine Port Authority initiate the following next steps:

1. Reengage Americold and share the details of the recommended design approach;
2. Negotiate final land lease terms; and
3. Facilitate financial commitments and the initiation of site development by Americold.

Please contact us if you have any questions and thank you again for the opportunity to continue to support you through the initial stages of this project.

Sincerely,

WOODARD & CURRAN

Jedd Steinglass, L.S.P.
Project Manager

Eric Carlson, C.G., P.E.
Senior Vice President

PN: 229944.02

Attachments:

Attachment A: Exploration Location Plan
Attachment B: Soil Boring Logs, Gradation, and Consolidation Results
Attachment C: Shear Wave Velocity Testing Report
Attachment D: Graphical Model of Potential Total Settlement
Attachment E: Foundation Detail Sketches
Attachment F: Budget Estimate Summaries

ATTACHMENT A: EXPLORATION LOCATION PLAN



LEGEND:

APPROXIMATE SEISMIC LINE

APPROXIMATE BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=40' SCALE PLAN OF THE SITE ENTITLED "SITE GRADING CONCEPT," PREPARED BY WOODARD & CURRAN, DATED FEBRUARY 2016.
2. THE BORINGS WERE LOCATED IN THE FIELD BY MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 40 80 Feet

S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

EXPLORATION LOCATION PLAN

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	1" = 40'
Date :	01/05/2018	Sheet:	1

R:\2016\16-1314\CAD\Drawings\16-1314-EP.dwg, 1/5/2018 2:53:32 PM, (1) CEM, S. W. Cole Engineering, Inc.

ATTACHMENT B: SOIL BORING LOGS, GRADATION, AND CONSOLIDATION RESULTS

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001
SHEET: 1 of 1
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 14' +/- | **TOTAL DEPTH (FT):** 25.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 4 ft 12/20/2017 Free water at 4'
GENERAL NOTES: Backfilled borehole with bentonite and drill cuttings.

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0.5-2.5	24/18	13-9-7-8			Medium dense, brown silty gravelly SAND (FILL)		
										2.0 Medium dense to loose, black gravel, some silt, some sand with wood (FILL) -petroleum odor	▽	
10	5		2D		5-7	24/12	5-4-6-4					
5	10		3D		10-12	24/12	4-3-4-3			-petroleum odor and sheen below 10'		
0	15		4D		15-17	24/10	3-3-4-3			FILL and coal tar		
-5	20		5D		20-21.8	21/5	8-7-6-50/3"			21.5 Concrete		
										22.0 Coal tar in casing prevented further drilling		
-10	25									25.0 Bottom of Exploration at 25.0 feet Abandoned hole at 25', excessive coal tar		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1001

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001A
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 14' +/- | **TOTAL DEPTH (FT):** 52.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 5 ft 12/20/2017 Soils saturated below 5'
GENERAL NOTES: Moved boring 25' +/- west of B-1001. Backfilled borehole with bentonite and drill cuttings.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
										Brown-black gravelly silty SAND with brick (FILL)	▽	
10	5											
5	10											
0	15		1D		15-17	24/12	9-6-4-7			-petroleum odor and sheen		
-5	20		2D		20-22	24/22	WOH FOR 12"-2-3	w =31.2 % O =2.0%		19.0 Very loose to loose, gray SAND and silt, some clay with shells (Bay Mud)		
-10	25		3D		25-27	24/20	2-4-3-3			24.0 Loose to medium dense, gray SAND and silt with frequent silty clay layers		
-15	30		4D		30-32	24/18	3-5-5-6	w =24.5 %				
-20	35		5D		35-37	24/2	4-3-10-9					
-25												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1001A

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001A
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			6D		40-42	24/24	4-3-4-6	w =19.4 %		Loose to medium dense, gray silty SAND with clay layers		
-30	45		7D		45-47	24/24	WOH FOR 12"-5-5					
-35	50		8D		50-52	24/18	7-11-11-12	w =21.2 %		49.0 Medium dense, brown silty SAND with clay layers		
										52.0 Bottom of Exploration at 52.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1001A

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT:	Woodard & Curran
PROJECT:	Proposed IMT West Cold Storage Facility
LOCATION:	West Commercial Street, Portland, Maine

BORING NO.:	**B-1002**
SHEET:	1 of 2
PROJECT NO.	16-1314
DATE START:	12/27/2017
DATE FINISH:	12/27/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 12' +/- | **TOTAL DEPTH (FT):** 52.0 | **LOGGED BY:** Patrick Otto

DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring

RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**

HAMMER EFFICIENCY FACTOR: 0.79 | **HAMMER DROP (inch):** 30 / 16

WATER LEVEL DEPTHS (ft): ▽ 7 ft 12/27/2017 Soils saturated below 7'

GENERAL NOTES: Backfilled borehole with bentonite to 16' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Concrete		
										1.1 Loose, brown silty SAND (FILL)		
10												
			1D		3-5	24/126	4-4-3-2					
	5		2D		5-7	24/15	4-4-4-4					
5										6.5 Loose, black silty SAND (FILL) -petroleum odor	▽	
	10		3D		10-12	24/14	4-7-9-6			9.0 Medium dense, gray gravelly SAND, some silt -petroleum odor		
0												
	15		4D		15-17	24/11	4-1-1-1	w =28.8 % O =1.9%		14.0 Very loose, gray silty SAND with organics -petroleum odor and sheen		
-5												
	20		5D		20-22	24/14	2-5-7-13			19.0 Medium dense, gray silty gravelly SAND		
-10												
	25		6D		25-27	24/14	3-3-9-7	w =25 %		24.0 Medium dense to loose, light brown silty SAND with silty clay layers		
-15												
	30		7D		30-32	24/12	4-8-8-7					
-20												
	35		8D		35-37	24/20	5-4-6-6	w =22.4 %				
-25												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1002

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1002
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/27/2017
DATE FINISH: 12/27/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			9D		40-42	24/18	6-4-2-5			40.0 Loose, gray silty SAND, some gravel with silty clay layers		
-30												
	45									45.0 Medium dense, gray SAND and silt		
-35												
	50		10D		50-52	24/14	4-8-18-19	w =23.1 %				
-40										52.0 Bottom of Exploration at 52.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1002

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT:	Woodard & Curran
PROJECT:	Proposed IMT West Cold Storage Facility
LOCATION:	West Commercial Street, Portland, Maine

BORING NO.:	**B-1003**
SHEET:	1 of 2
PROJECT NO.	16-1314
DATE START:	12/21/2017
DATE FINISH:	12/21/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 12' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto

DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring

RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**

HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16

WATER LEVEL DEPTHS (ft): ▽ 4.5 ft 12/21/2017 Free water at 4.5'

GENERAL NOTES: Moved borehole 8-10' west after drilling through concrete at 4-5' and void from 5-10'. Backfilled borehole with bentonite to 16' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10										Medium dense, black-brown silty gravelly SAND with brick (FILL) -Petroleum odor at 5-7'		
	5		1D		5-7	24/19	5-12-8-3				▽	
5												
	10		2D		10-11.5	18/7	1-1-1-25/0"			Very loose		
0										11.5 Concrete		
	15		3D		15-17	24/13	6-12-12-16			13.0 Medium dense, black sandy SILT with ash (FILL) -Petroleum odor and sheen		
-5												
	20		4D		20-22	24/9	6-6-4-3	w =22.6 % O =1.7%		19.0 Medium dense to loose, gray-brown silty SAND with wood		
-10												
	25		5D		25-27	24/15	WOH-1-1-1	w =39.7 % O =2.8%		Very loose, gray sandy SILT with shells and organics (Bay Mud)		
-15												
	30		6D		30-32	24/24	WOH FOR 24"			29.0 Medium to stiff, gray silty CLAY with shells and organics to 32'		
-20												
	35		1U		35-37	24/24		W_L=55 W_P=30				
-25			1V	FP	37-37.5	6		S_V=1.55/0.31ksf				
			1V'		37.5-38	6		S_V=1.61/0.31ksf				

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1003

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1003
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/21/2017
DATE FINISH: 12/21/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Medium to stiff, gray silty CLAY		
-30												
	45		2U		45-47	24/24						
								W_L=55 W_P=27				
-35			2V		47-47.5	6		S_V=1.92/0.43ksf				
			2V'		47.5-48	6		S_V=2.11/0.62ksf				
	50											
-40												
	55		3U		55-57	24/24						
								W_L=48 W_P=25				
-45			3V		57-57.5	6		S_V=1.61/0.43ksf				
			3V'		57.5-58	6		S_V=1.92/0.43ksf				
	60		7D		60-62	24/24	WOH-WOH FOR 12"-2			59.0 Very loose, gray SAND and silt with shells and wood		
-50												
	65		8D		65-67	24/24	1-1-2-2	w =23.6 %				
-55												
	70		9D		70-72	24/19	7-16-21-22	w =16.5 %		69.0 Dense, gray fine to medium SAND, some gravel, some silt		
-60												
	75											
-65												
	80		10D		80-82	24/21	8-18-20-29	w =20.6 %		79.0 Dense, gray silty fine to medium SAND		
-70										82.0 Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1003

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1004
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/18/2017
DATE FINISH: 12/18/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 10' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 8 ft 12/18/2017 Soils wet 5-7' and saturated below 8'.
GENERAL NOTES: Backfilled borehole with bentonite to 22' below ground surface.

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/16	5-5-6-6			Medium dense, brown-gray-black silty gravelly SAND (FILL)		
5	5		2D		5-7	24/8	4-1-1-1			5.5 Very loose, gray SAND and silt, some clay with shells (FILL) -naphthalene odor	▽	
										8.0 Loose, brown-black silty SAND and gravel (FILL) -petroleum sheen and naphthalene odor		
0	10		3D		10-12	24/10	5-3-6-6					
-5	15		4D		15-17	24/12	2-3-2-2					
-10	20		5D		20-22	24/13	1-2-1-1	w =31 % O =1.8%		19.0 Very loose, gray SILT and sand, trace gravel with shells, organics (Bay Mud)		
-15	25		6D		25-27	24/24	WOH FOR 24"	w =48.3 % O =2.9%		24.0 Medium to stiff, gray silty CLAY with sand layers/seams		
-20	30		1U		30-32	24/12		W_L=47 W_P=28 w =53.4 % S_V=1.05/0.27ksf S_V=1.09+ksf				
			1V		32-32.7	8						
			1V'		32.7-33.4	8						
-25	35											

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1004

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1004
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/18/2017
DATE FINISH: 12/18/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			2U		40-42	24/24		W_L=53 W_P=29 w =54.6 %				
			2V		42-					could not advance vane		
-35	45									Medium to stiff, gray silty CLAY with occasional sand layers		
-40	50		3U		50-52	24/24		W_L=55 W_P=30 w =55.4 %				
			3V		52-					could not advance vane		
-45	55											
-50	60		7D		60-62	24/24	3-4-2-8	w =25.7 %		60.5 Loose, gray silty SAND with shells and wood		
-55	65		8D		65-67	24/14	3-6-4-3			64.5 Medium dense to loose, gray silty medium to coarse SAND with wood and occasional silty clay seams/layers		
-60	70		9D		70-72	24/18	WOR-5-8-15	w =21.7 %		69.0 Medium dense, gray SAND and silt with silty clay layers		
-65	75											
-70	80		10D		80-82	24/16	5-10-9-19	w =21 %		82.0 Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1004

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1005
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/19/2017
DATE FINISH: 12/19/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 11' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 8 ft 12/19/2017 Soils saturated below 8'
GENERAL NOTES: Backfilled borehole with bentonite to 19' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10			1D	D	0-2	24/16	3-6-11-18			Medium dense to very loose, brown-black silty gravelly SAND with brick (FILL) -petroleum odor and sheen below-		
5	5		2D	D	5-7	24/18	13-15-6-8				▽	
0	10		3D	D	10-12	24/18	1-2-1-2					
										11.0 Very loose to medium dense, gray SAND and silt, some gravel with shells and wood (Bay Mud)		
-5	15		4D	D	15-17	24/7	2-1-1-3					
-10	20		5D	D	20-22	24/16	4-6-5-6	w =25.5 % O =1.2%				
-15	25		6D	D	25-27	24/1	6-4-2-2			Cobble at 24'		
										28.0 Medium to stiff, gray silty CLAY with sand layers/seams		
-20	30		7D	D	30-32	24/5	1-1-2-3	w =38.9 % O =2.0%				
-25	35		1U	U	35-37	24/24		W_L=49 W_P=26 w =46.5 % S_V=2.05/0.31ksf				
			1V	PP	37-37.5	6		S_V=1.86/0.31ksf				
			1V'	PP	37.5-38	6						

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1005

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1005
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/19/2017
DATE FINISH: 12/19/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-30										Medium to stiff, gray silty CLAY with sand layers/seams		
	45		2U		45-47	24/22		W_L=54 W_P=29				
-35			2V	PP	47-47.5	6		w =51.1 % S_V=2.17/0.43ksf				
			2V'		47.5-48	6		S_V=2.17/0.62ksf				
	50											
-40												
	55		3U		55-57	24/21		W_L=43 W_P=24				
-45			3V	PP	57-57.5	6		w =41.2 % S_V=2.05/0.56ksf				
			3V'		57.5-58	6		S_V=2.17/0.50ksf				
	60									59.0		
-50			8D		60-62	24/18	4-3-4-5	w =23 %		Loose to medium dense, gray silty fine to coarse SAND with wood and pinecones		
	65		9D		65-67	24/16	6-7-11-15					
-55												
										69.0		
	70		10D		70-72	24/10	5-5-5-2	w =21.1 %		Loose to medium dense, gray SAND, some silt, some gravel		
-60												
										75.0		
	75									Medium dense, gray silty SAND		
-65												
	80		11D		80-82	24/18	2-5-11-13	w =21 %				
-70										82.0		
										Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1005

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

KEY TO NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

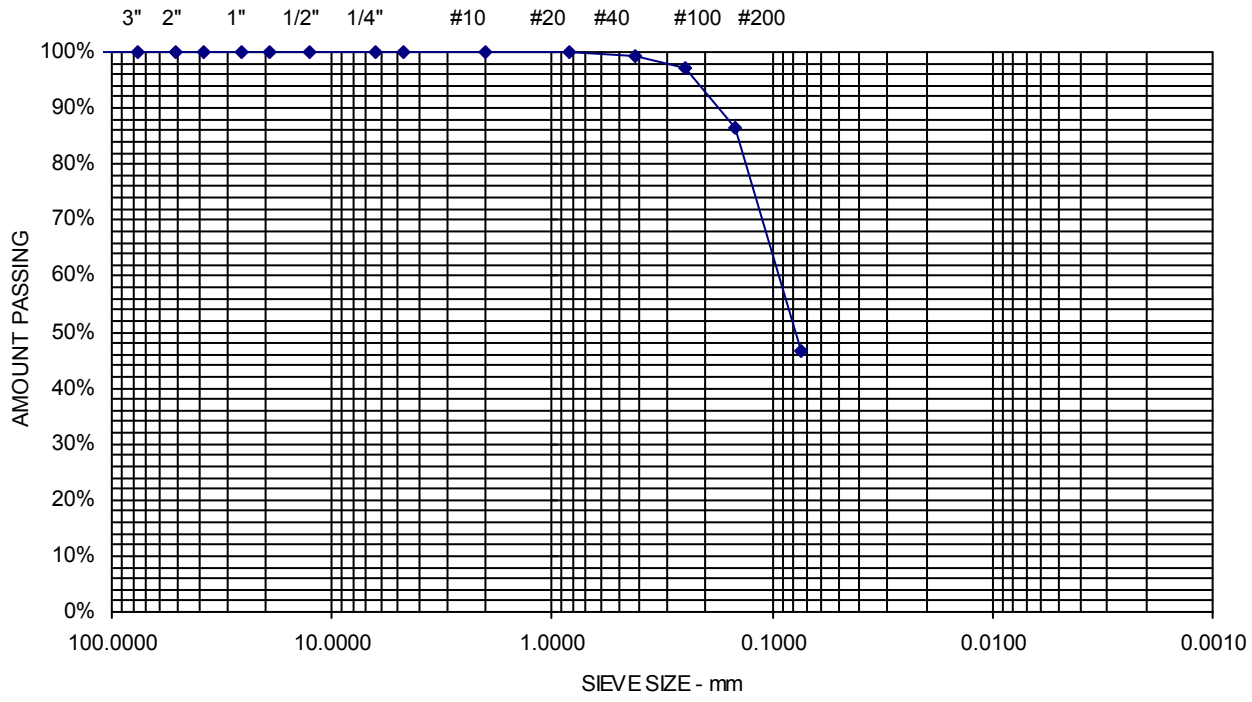
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23279G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1001A 4D 30-32**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**99**	53.3% Sand
250 um	**No. 60**	**97**	
150 um	**No. 100**	**86**	
75 um	**No. 200**	**46.7**	46.7% Fines



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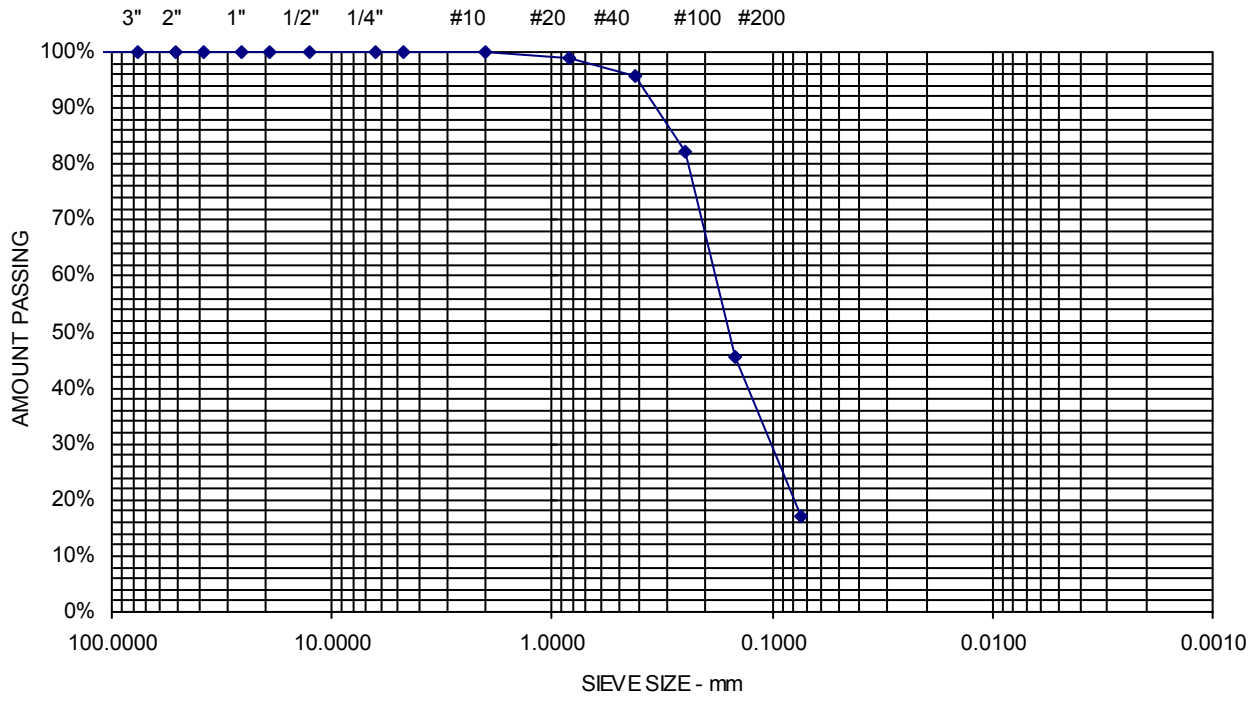
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23280G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1001A 6D 40-42**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**99**	
425 um	**No. 40**	**96**	82.8% Sand
250 um	**No. 60**	**82**	
150 um	**No. 100**	**46**	
75 um	**No. 200**	**17.2**	17.2% Fines



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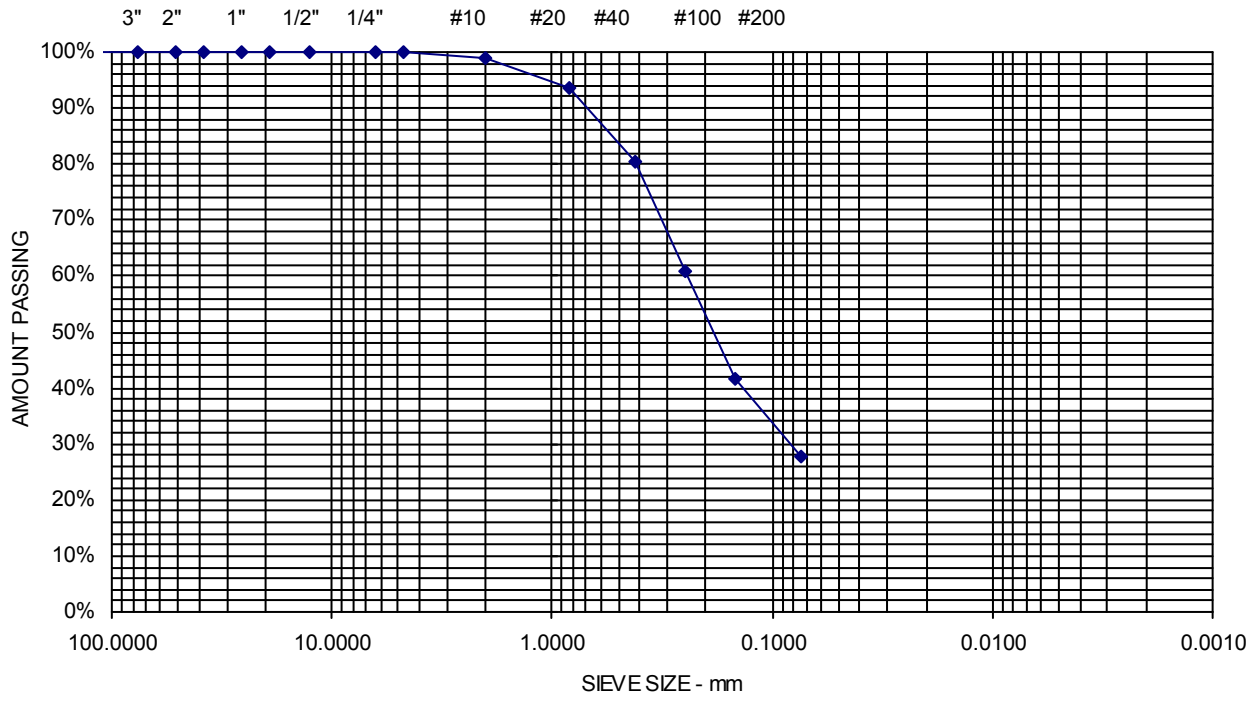
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23281G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1001A 8D 50-52**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**93**	
425 um	**No. 40**	**80**	72.4% Sand
250 um	**No. 60**	**61**	
150 um	**No. 100**	**42**	
75 um	**No. 200**	**27.6**	27.6% Fines



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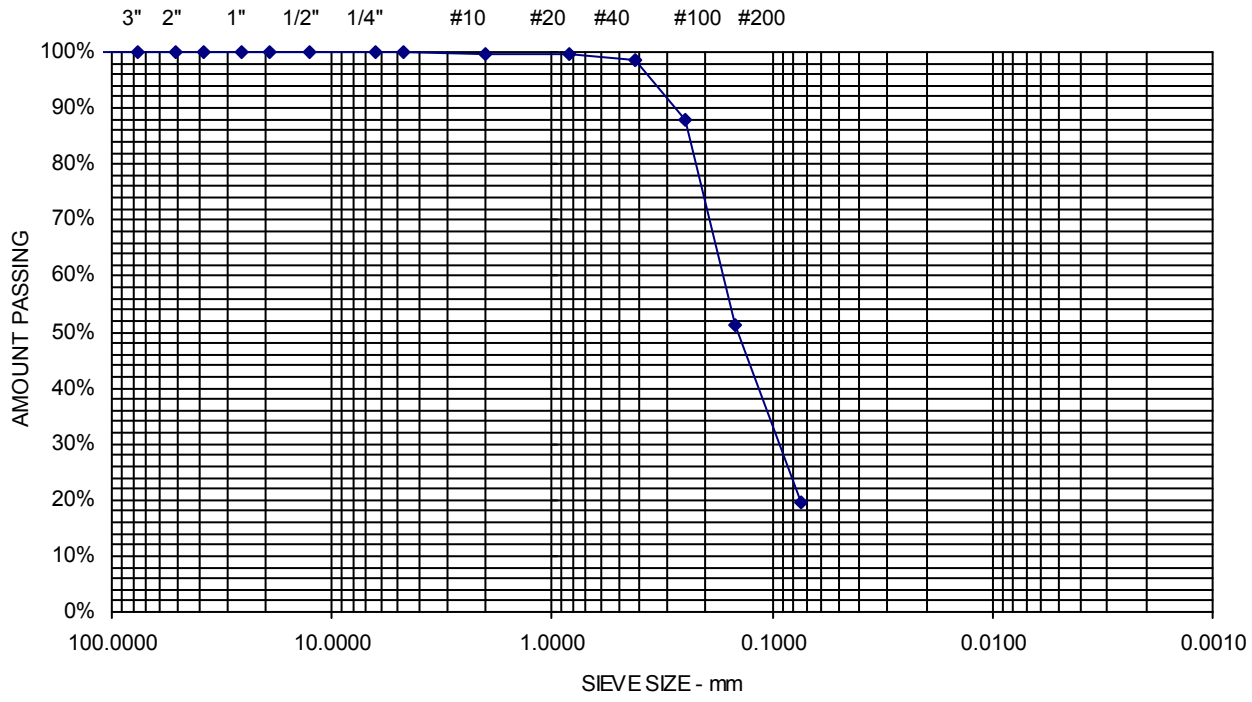
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23283G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1002 6D 25-27**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**98**	80.3% Sand
250 um	**No. 60**	**88**	
150 um	**No. 100**	**51**	
75 um	**No. 200**	**19.7**	19.7% Fines



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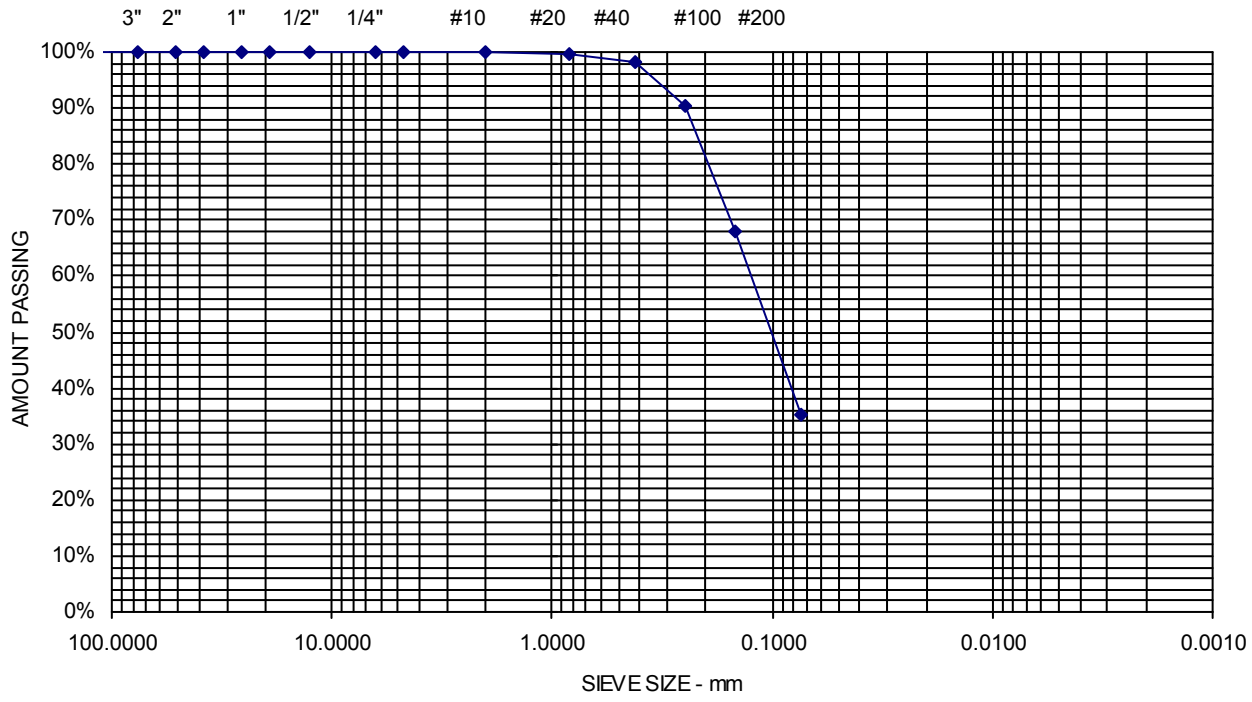
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23284G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1002 8D 35-37**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**98**	64.6% Sand
250 um	**No. 60**	**90**	
150 um	**No. 100**	**68**	
75 um	**No. 200**	**35.4**	35.4% Fines



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Sheet

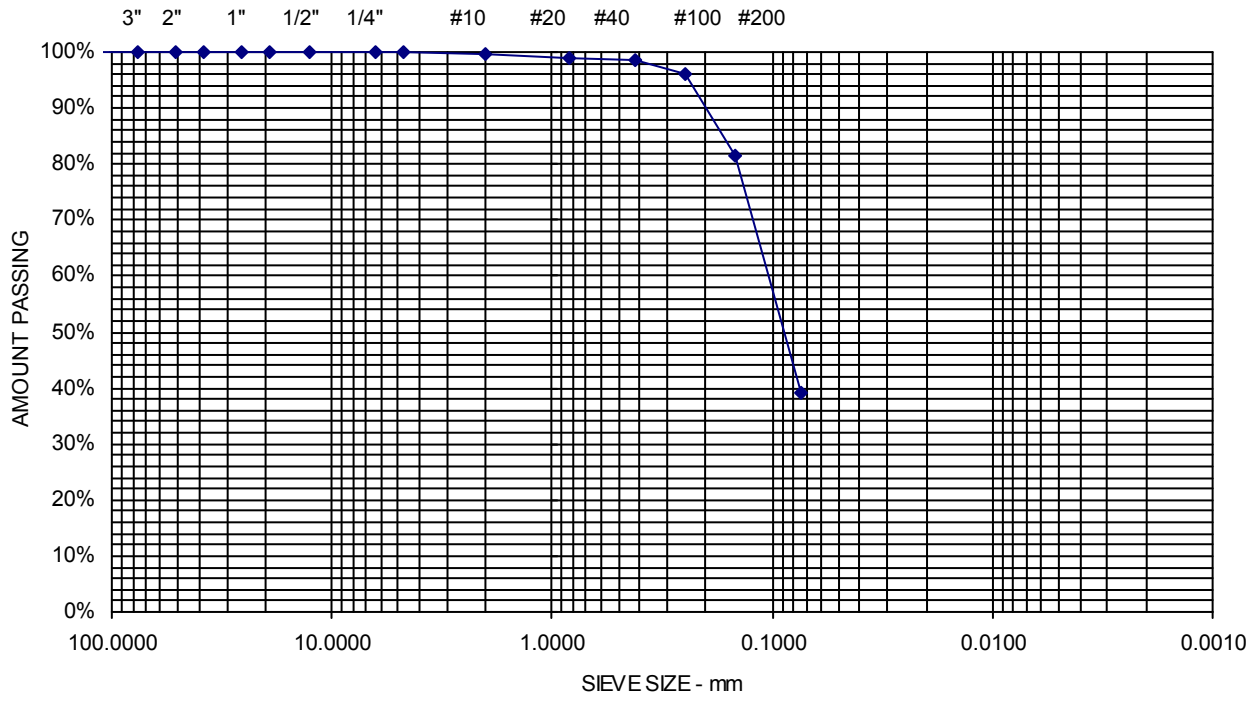
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23285G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1002 10D 50-52**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**99**	
425 um	**No. 40**	**98**	60.9% Sand
250 um	**No. 60**	**96**	
150 um	**No. 100**	**82**	
75 um	**No. 200**	**39.1**	39.1% Fines



Comments: w = 23.1%

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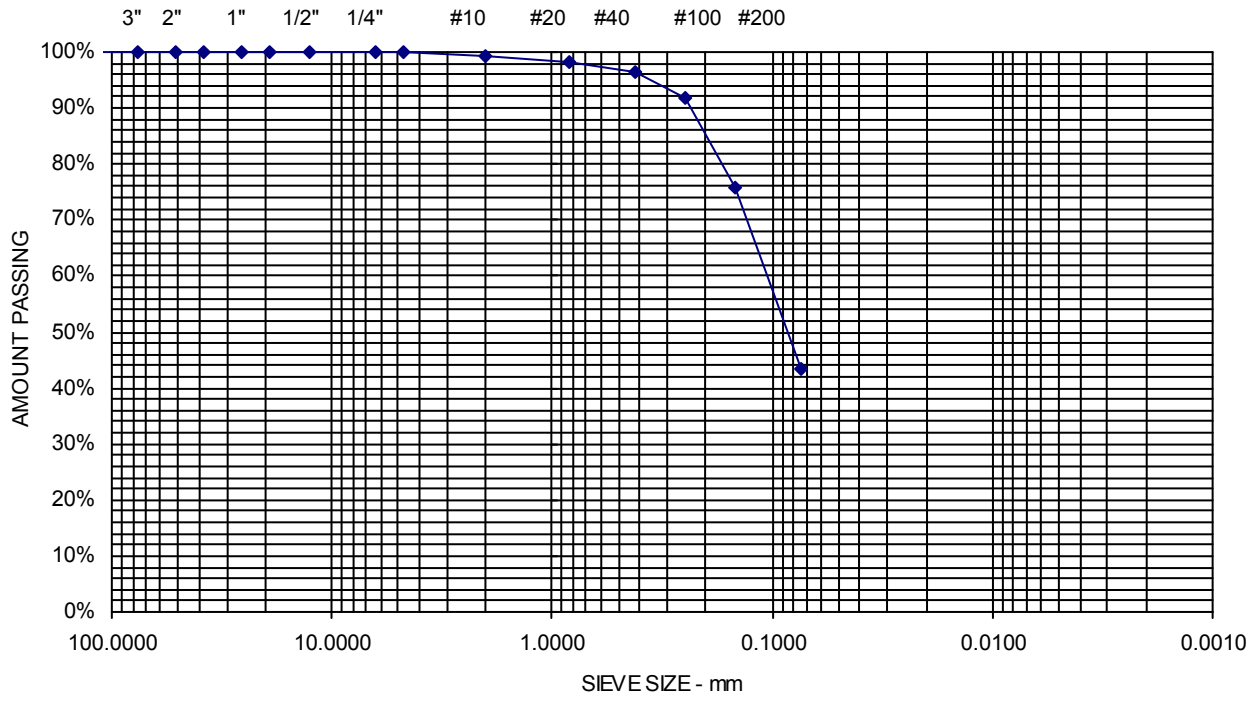
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23288G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1003 8D 65-67**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**98**	
425 um	**No. 40**	**96**	56.5% Sand
250 um	**No. 60**	**92**	
150 um	**No. 100**	**76**	
75 um	**No. 200**	**43.5**	43.5% Fines



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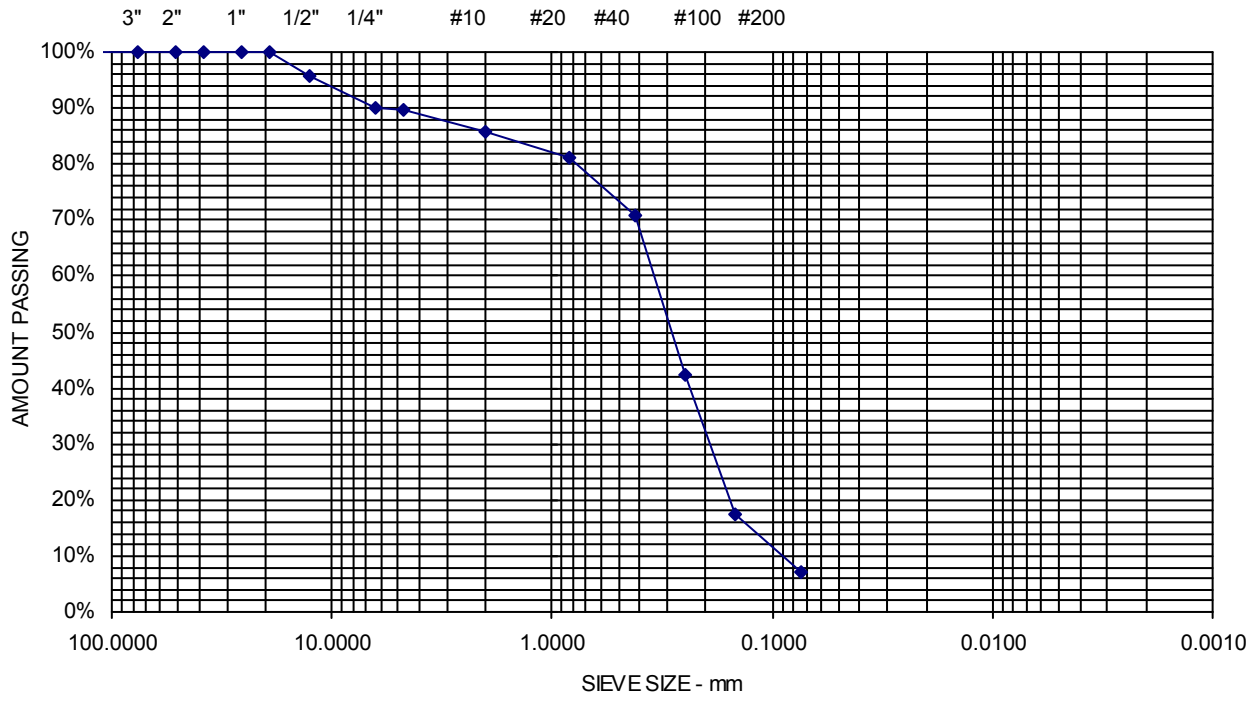
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23289G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1003 9D 70-72**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**96**	
6.3 mm	**1/4"**	**90**	
4.75 mm	**No. 4**	**90**	10.3% Gravel
2.00 mm	**No. 10**	**86**	
850 um	**No. 20**	**81**	
425 um	**No. 40**	**71**	82.7% Sand
250 um	**No. 60**	**42**	
150 um	**No. 100**	**17**	
75 um	**No. 200**	**7.0**	7% Fines



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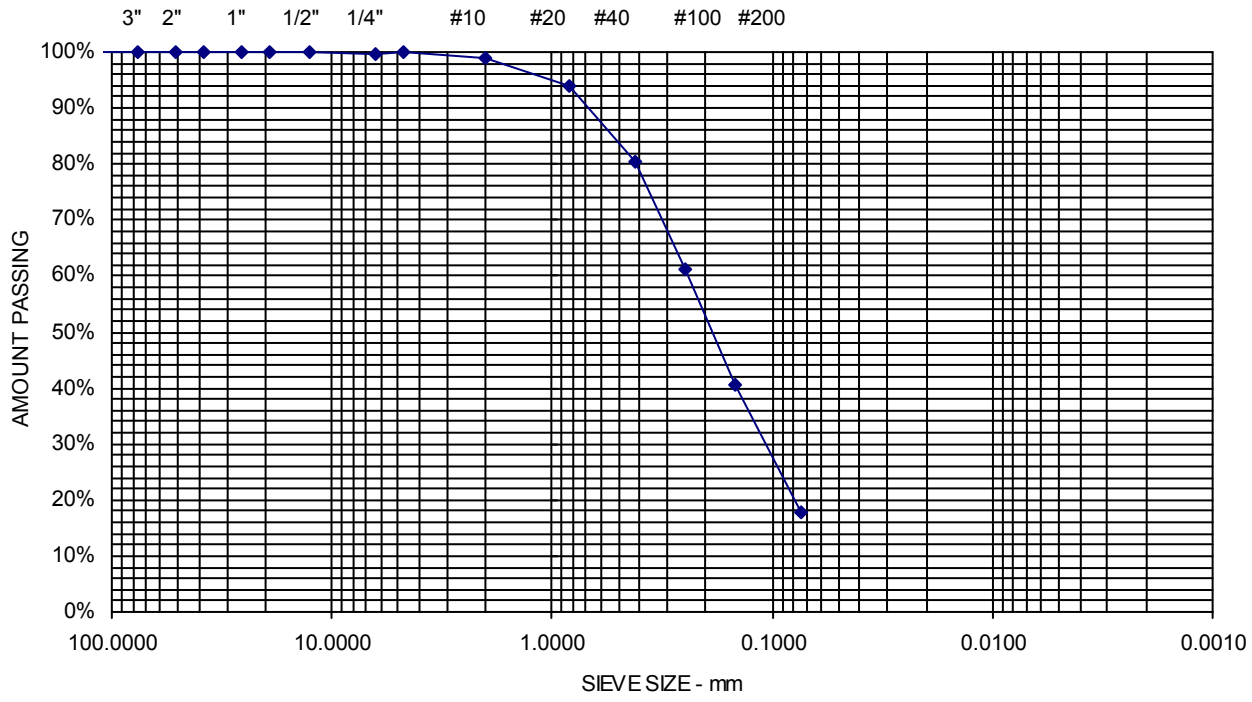
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23290G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1003 10D 80-82**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**94**	
425 um	**No. 40**	**81**	82.2% Sand
250 um	**No. 60**	**61**	
150 um	**No. 100**	**40**	
75 um	**No. 200**	**17.8**	17.8% Fines



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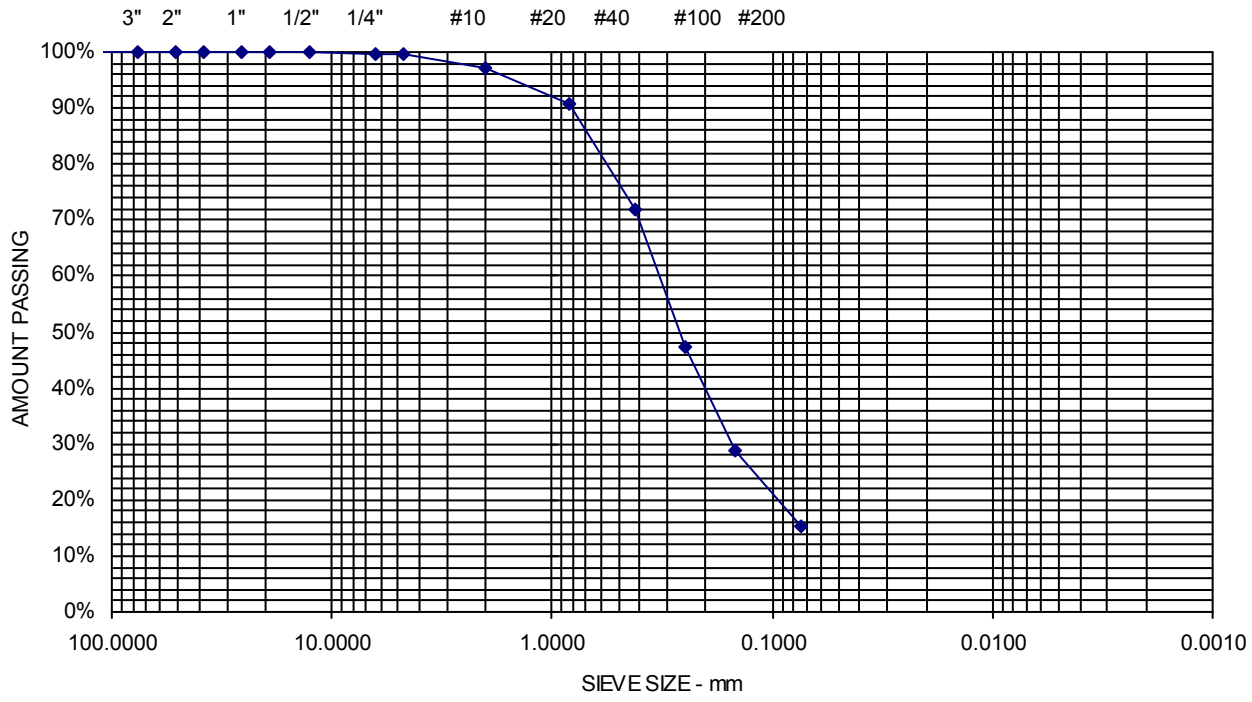
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23293G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1004 7D 60-62**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0.5% Gravel
2.00 mm	**No. 10**	**97**	
850 um	**No. 20**	**91**	
425 um	**No. 40**	**72**	84.2% Sand
250 um	**No. 60**	**47**	
150 um	**No. 100**	**29**	
75 um	**No. 200**	**15.4**	15.4% Fines



Comments: w = 25.7%

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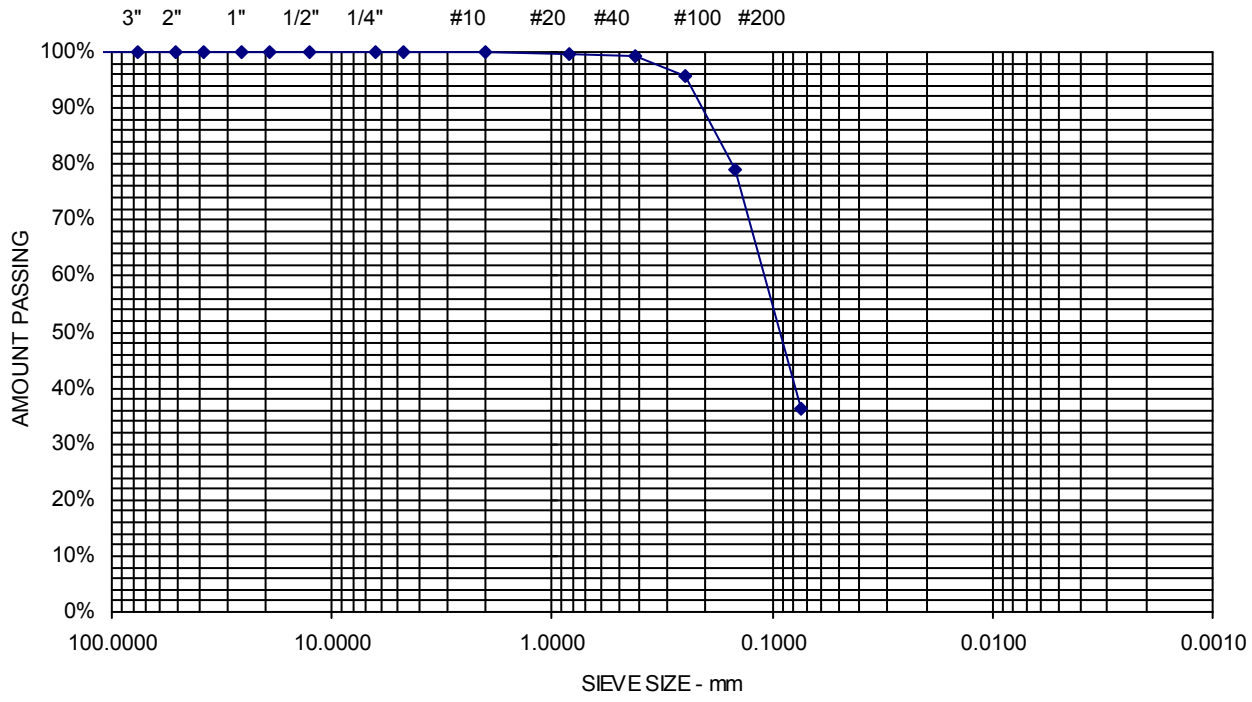
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23294G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1004 9D 70-72**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**99**	63.8% Sand
250 um	**No. 60**	**96**	
150 um	**No. 100**	**79**	
75 um	**No. 200**	**36.2**	36.2% Fines



Comments: w = 21.7%

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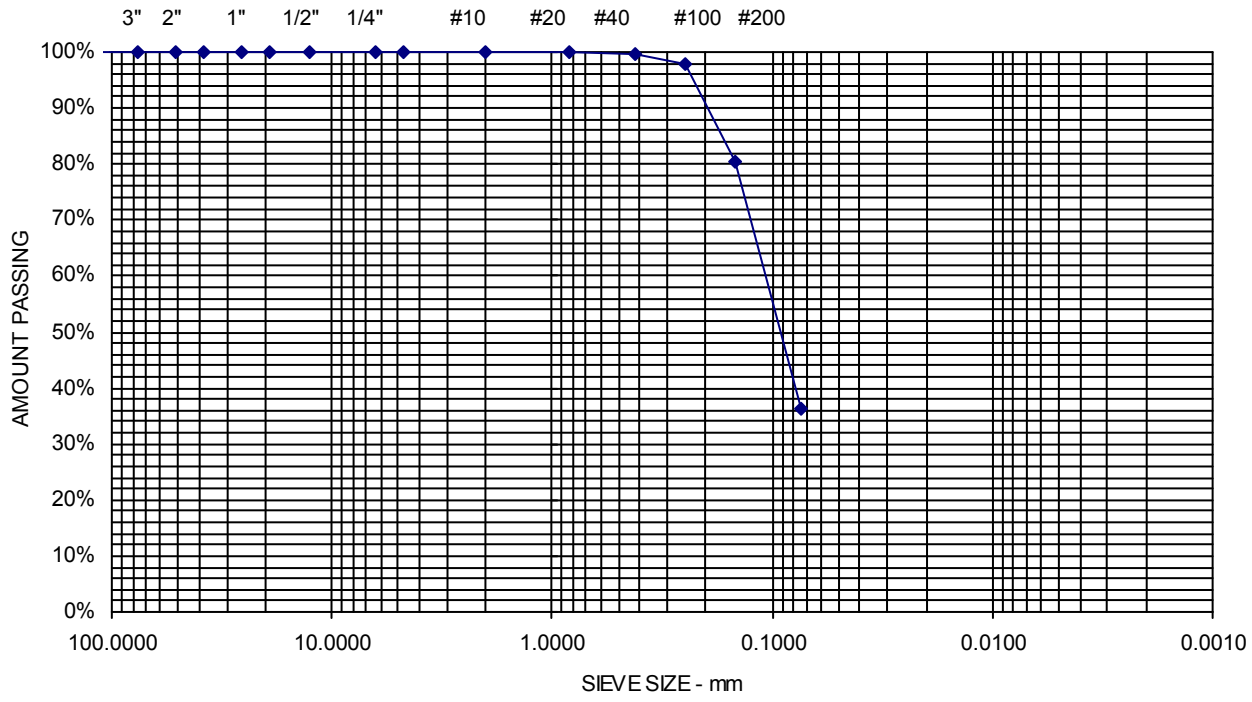
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23295G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1004 10D 80-82**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**100**	63.6% Sand
250 um	**No. 60**	**98**	
150 um	**No. 100**	**80**	
75 um	**No. 200**	**36.4**	36.4% Fines



Comments: w = 21.0%

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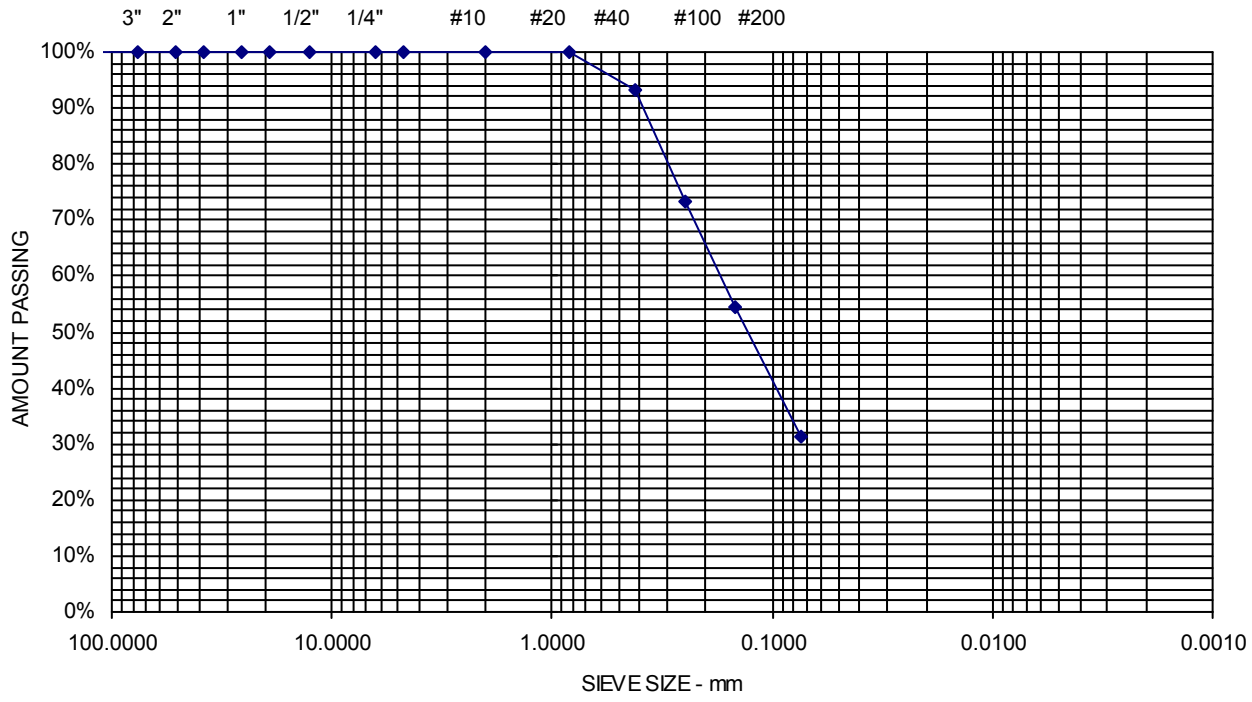
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23298G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1005 8D 60-62**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**93**	68.6% Sand
250 um	**No. 60**	**73**	
150 um	**No. 100**	**55**	
75 um	**No. 200**	**31.4**	31.4% Fines



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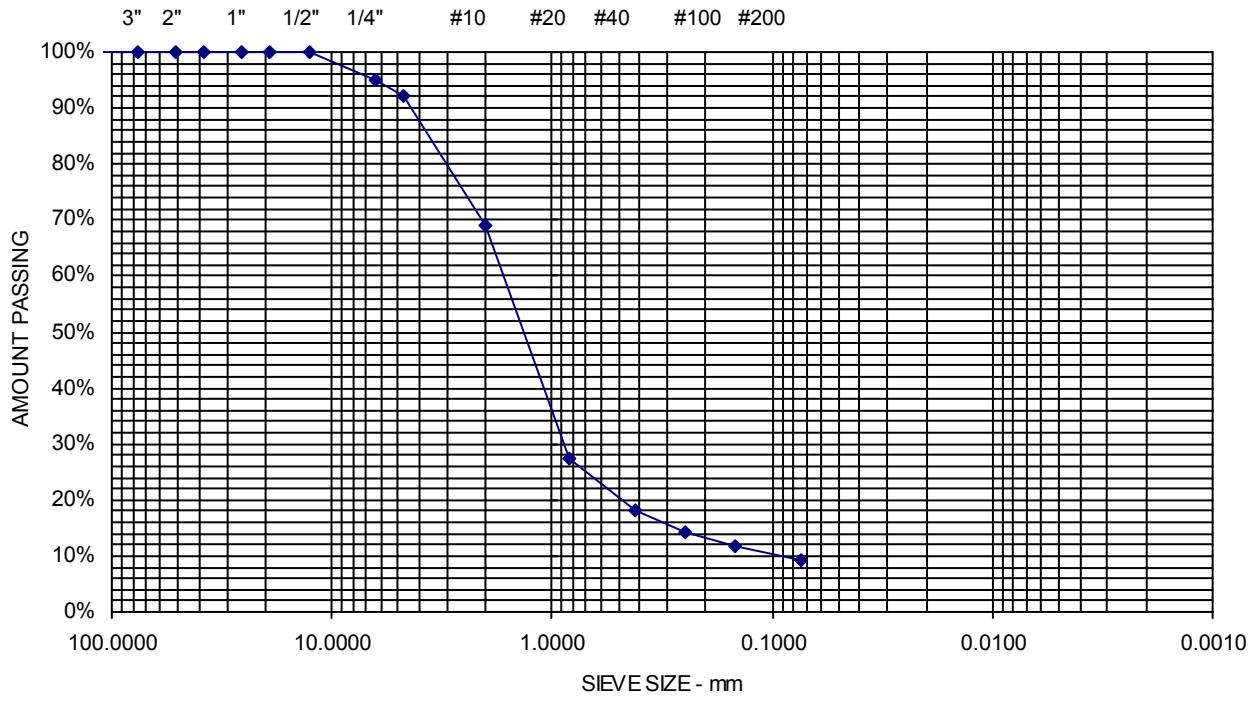
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23299G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1005 10D 70-72**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**95**	
4.75 mm	**No. 4**	**92**	8% Gravel
2.00 mm	**No. 10**	**69**	
850 um	**No. 20**	**27**	
425 um	**No. 40**	**18**	82.8% Sand
250 um	**No. 60**	**14**	
150 um	**No. 100**	**12**	
75 um	**No. 200**	**9.2**	9.2% Fines



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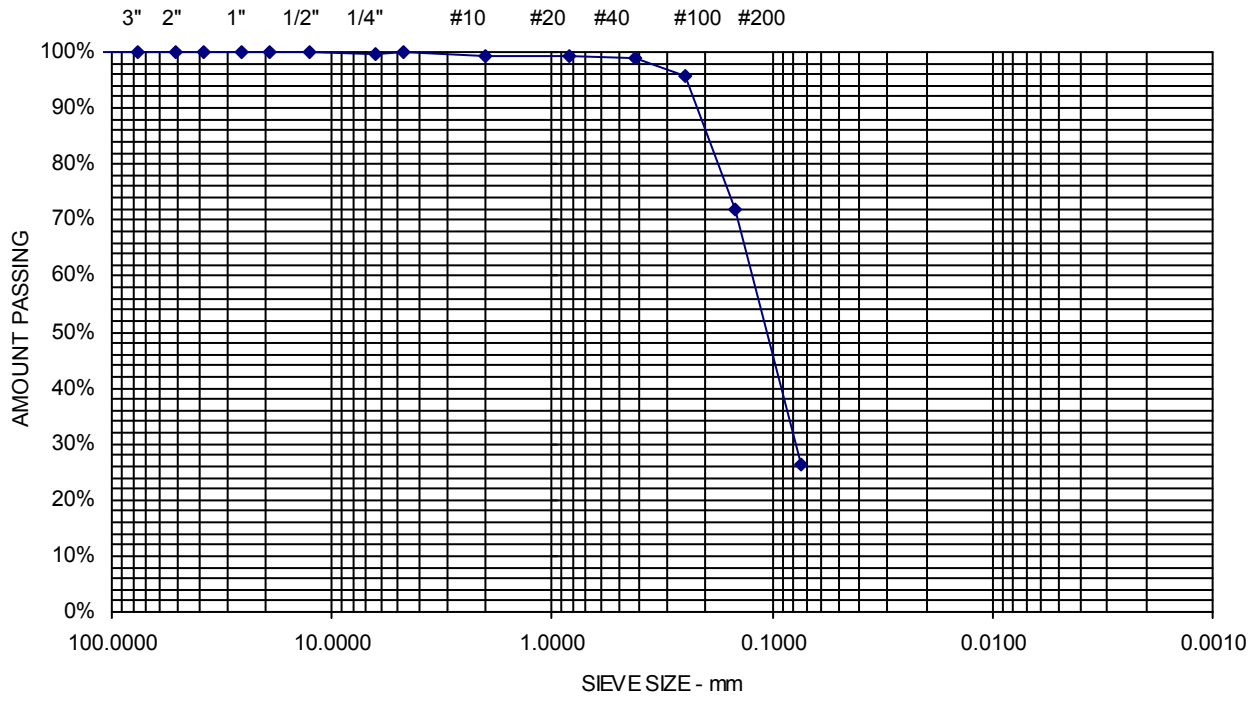
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED IMT COLD STORAGE WAREHOUSE - GEOTECHNICAL ENGINEERING SERVICES	Project Number	16-1314
Client	WOODARD & CURRAN, INC.	Lab ID	23300G
		Date Received	12/29/2017
		Date Completed	1/3/2018
Material Source	**B-1005 11D 80-82**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**99**	
425 um	**No. 40**	**99**	73.6% Sand
250 um	**No. 60**	**96**	
150 um	**No. 100**	**72**	
75 um	**No. 200**	**26.4**	26.4% Fines



Comments: w = 21.0%

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S.W.COLE ENGINEERING, INC.

Consolidation Test

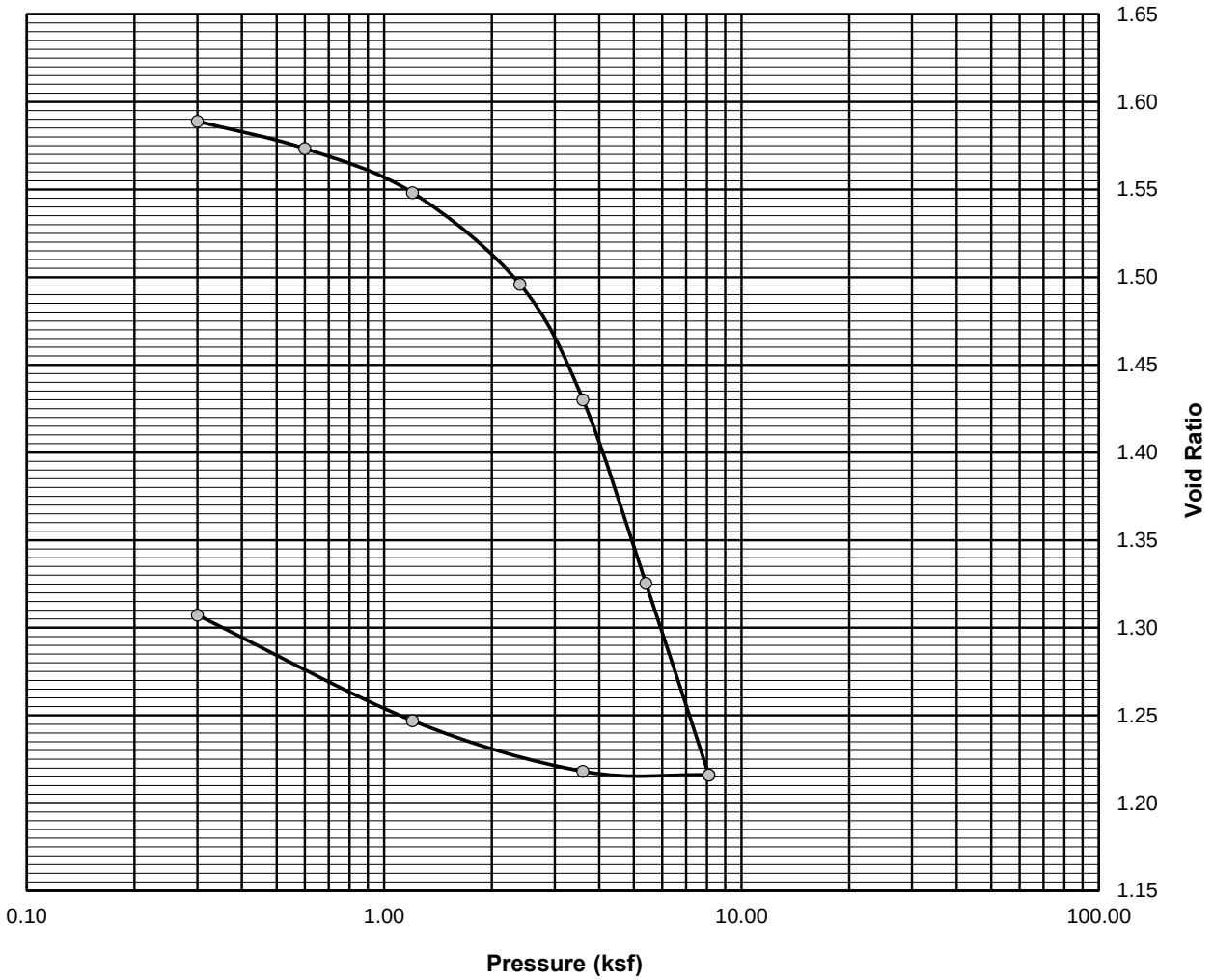
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21264B
Date: 1/30/2018

Boring: B1003
Sample: 1U
Depth: 35-37'

P_C =	2.7	ksf
C_C =	0.61	
C_R =	0.05	
w =	55.2%	
W_L =	55	
W_P =	30	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

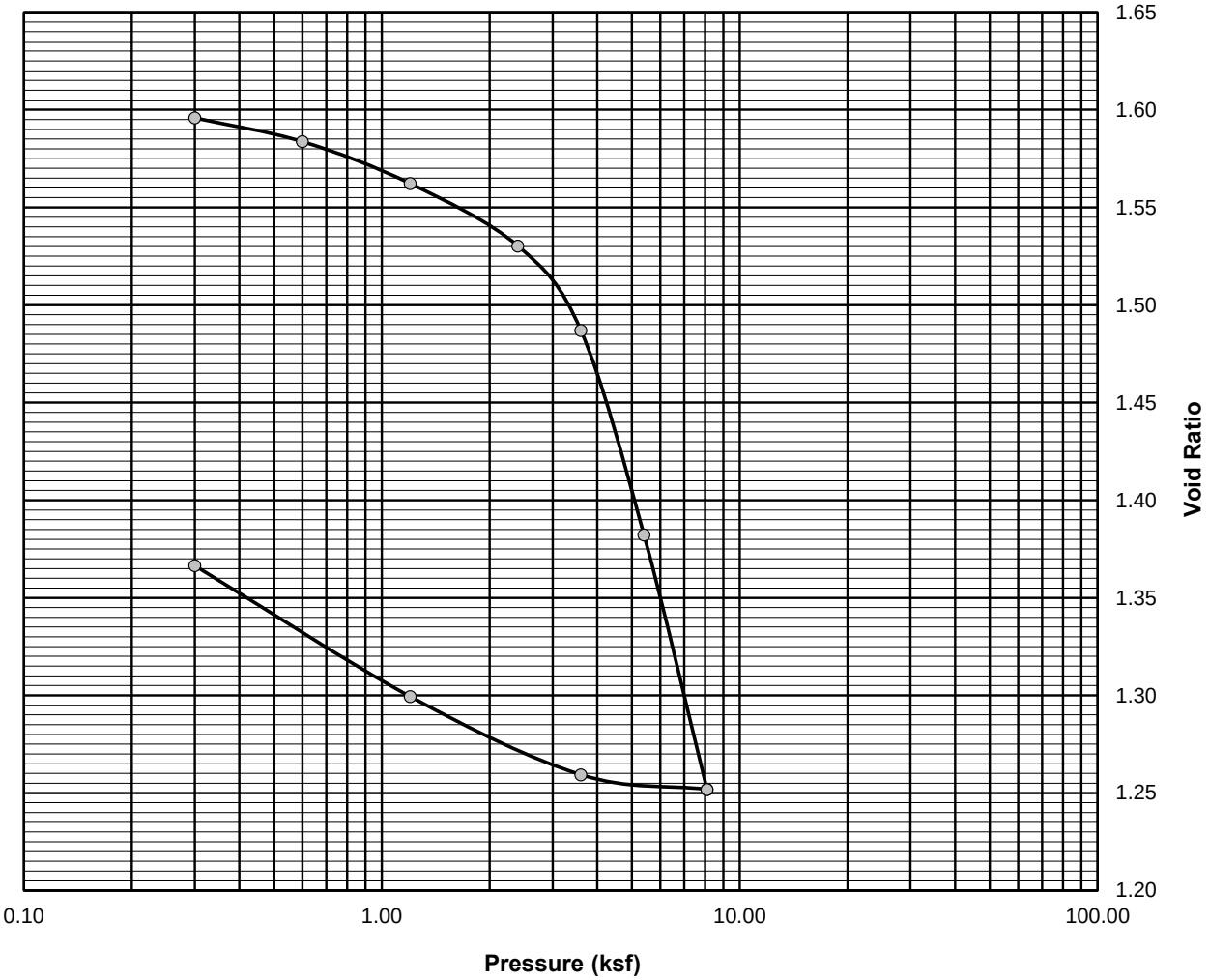
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21265B
Date: 1/30/2018

Boring: B1003
Sample: 2U
Depth: 45-47'

P_C =	3.1	ksf
C_C =	0.67	
C_R =	0.04	
w =	54.7%	
W_L =	48	
W_P =	25	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

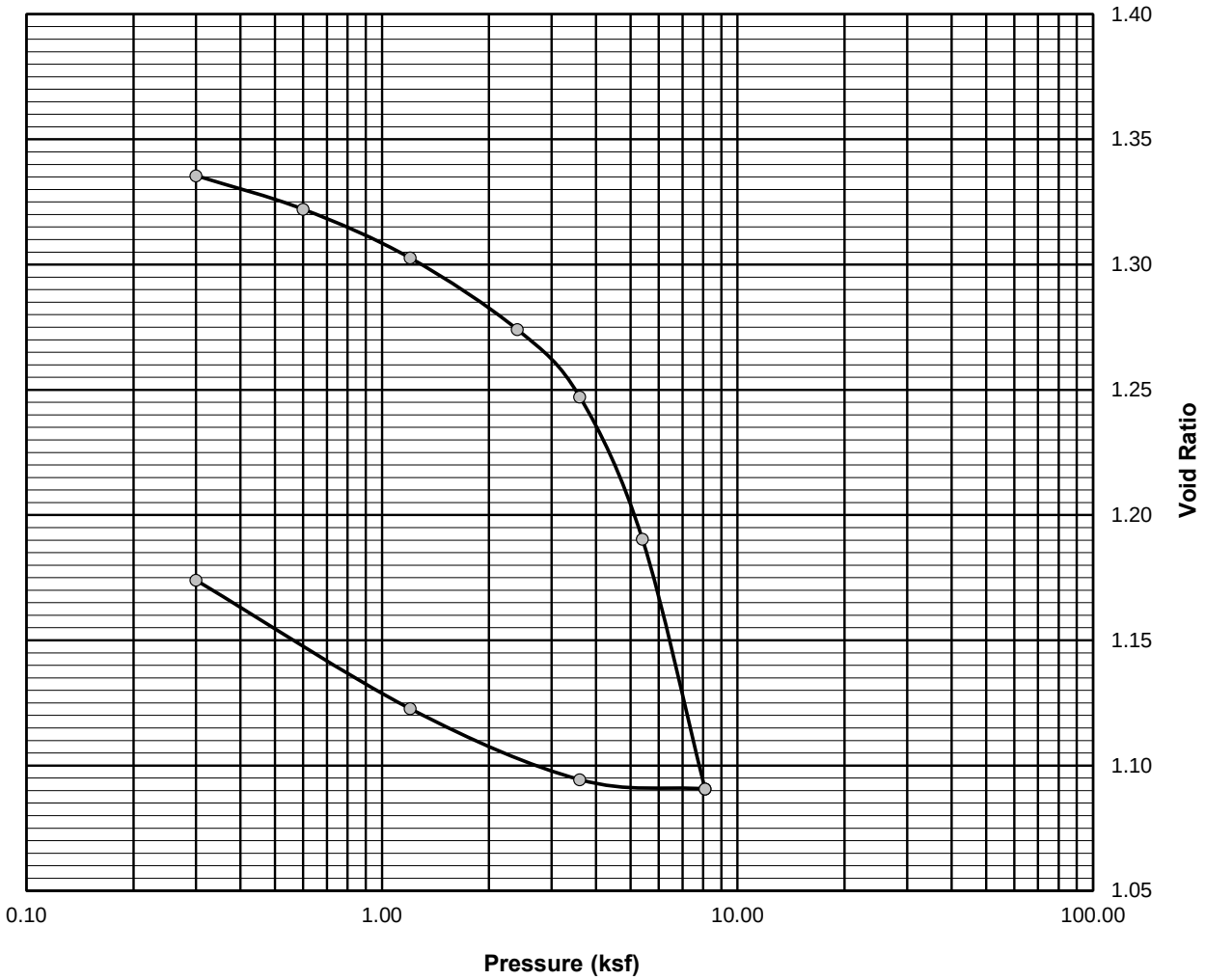
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21266B
Date: 1/30/2018

Boring: B1003
Sample: 3U
Depth: 55-57'

P_C =	4	ksf
C_C =	0.44	
C_R =	0.04	
w =	49.0%	
W_L =	55	
W_P =	27	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

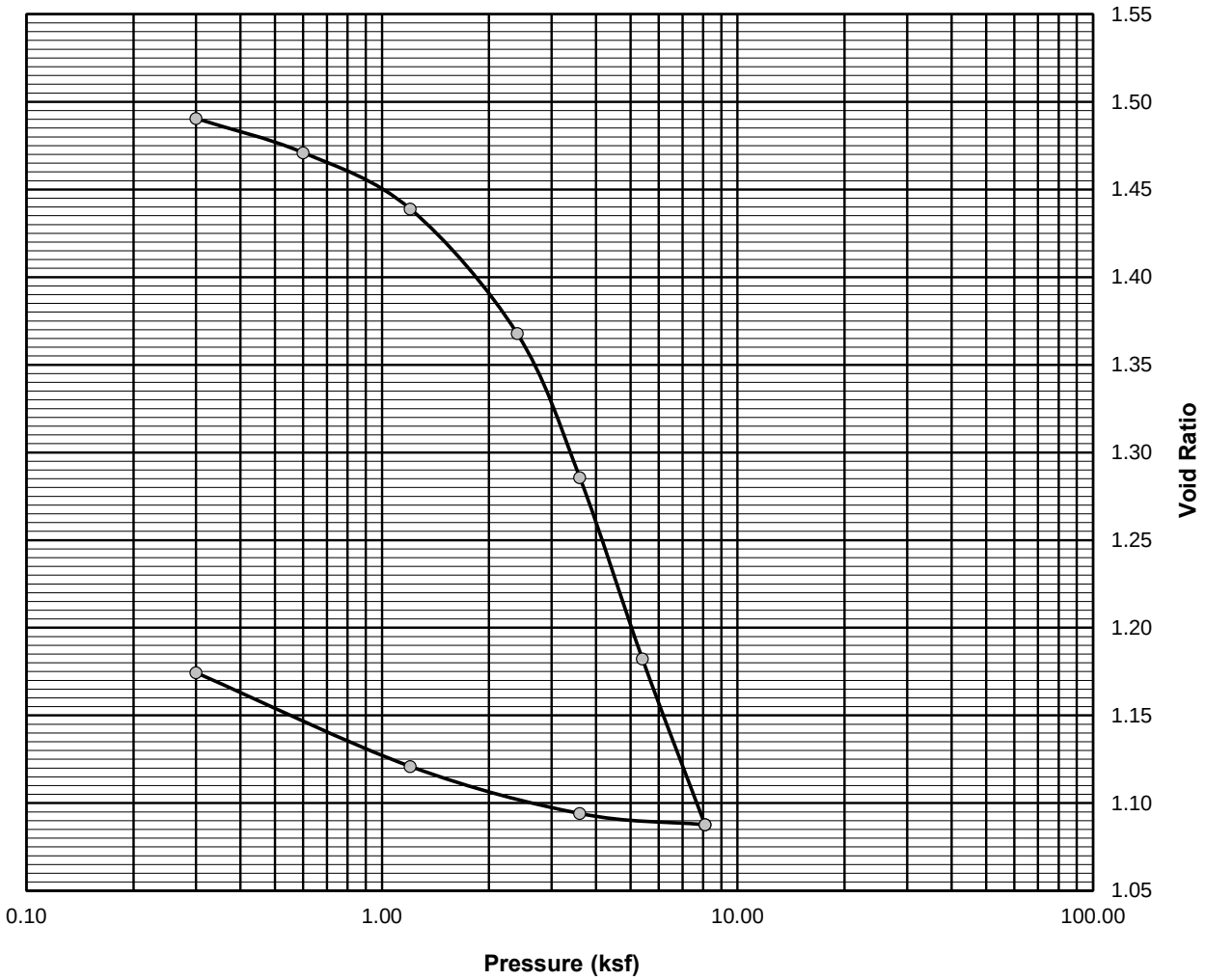
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21267B
Date: 12/29/2017

Boring: B1004
Sample: 1U
Depth: 30-32'

P_C =	2.1	ksf
C_C =	0.56	
C_R =	0.06	
w =	53.4%	
W_L =	47	
W_P =	48	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

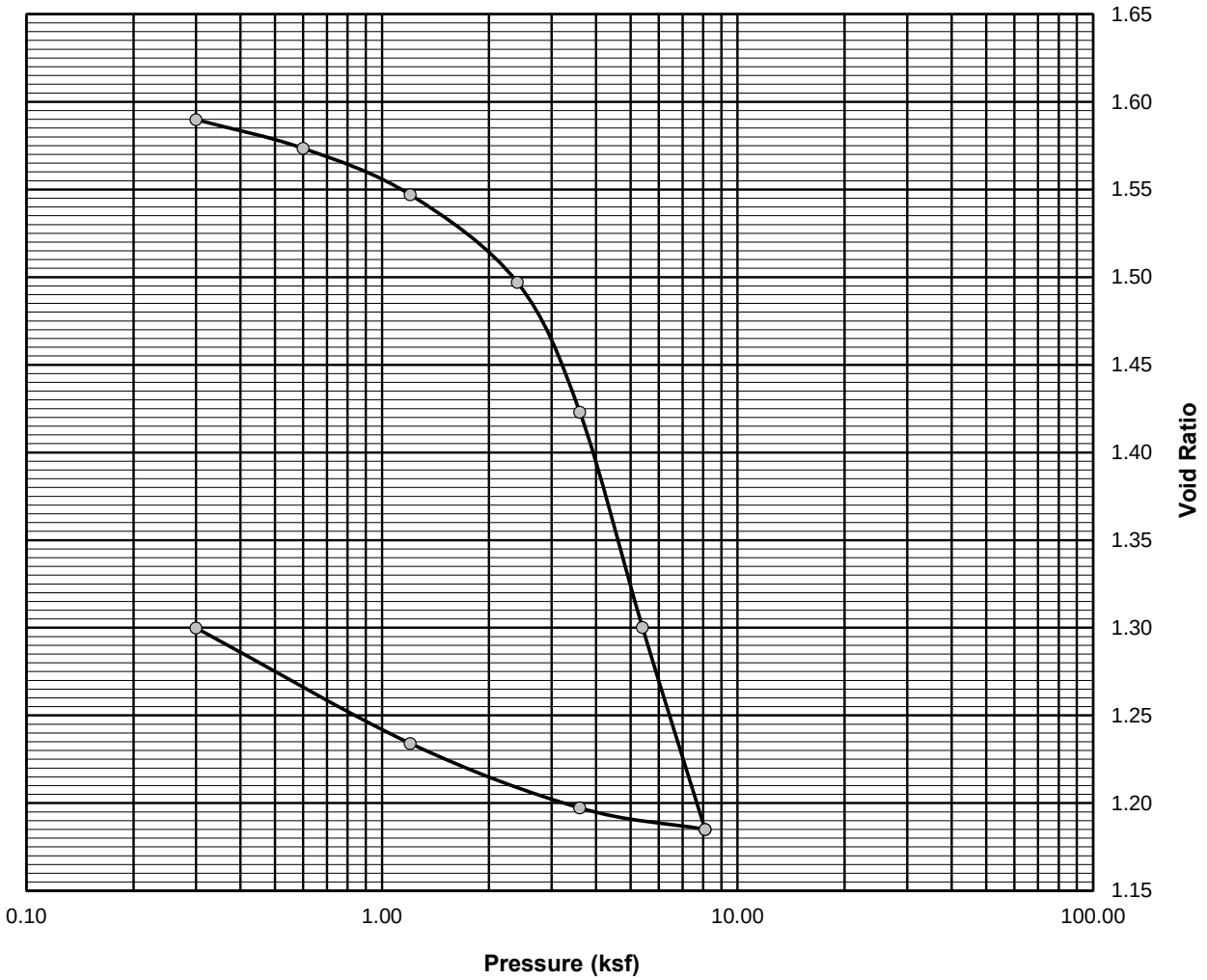
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21268B
Date: 12/29/2017

Boring: B1004
Sample: 2U
Depth: 40-42'

P_C =	2.9	ksf
C_C =	0.68	
C_R =	0.05	
w =	54.6%	
W_L =	53	
W_P =	29	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

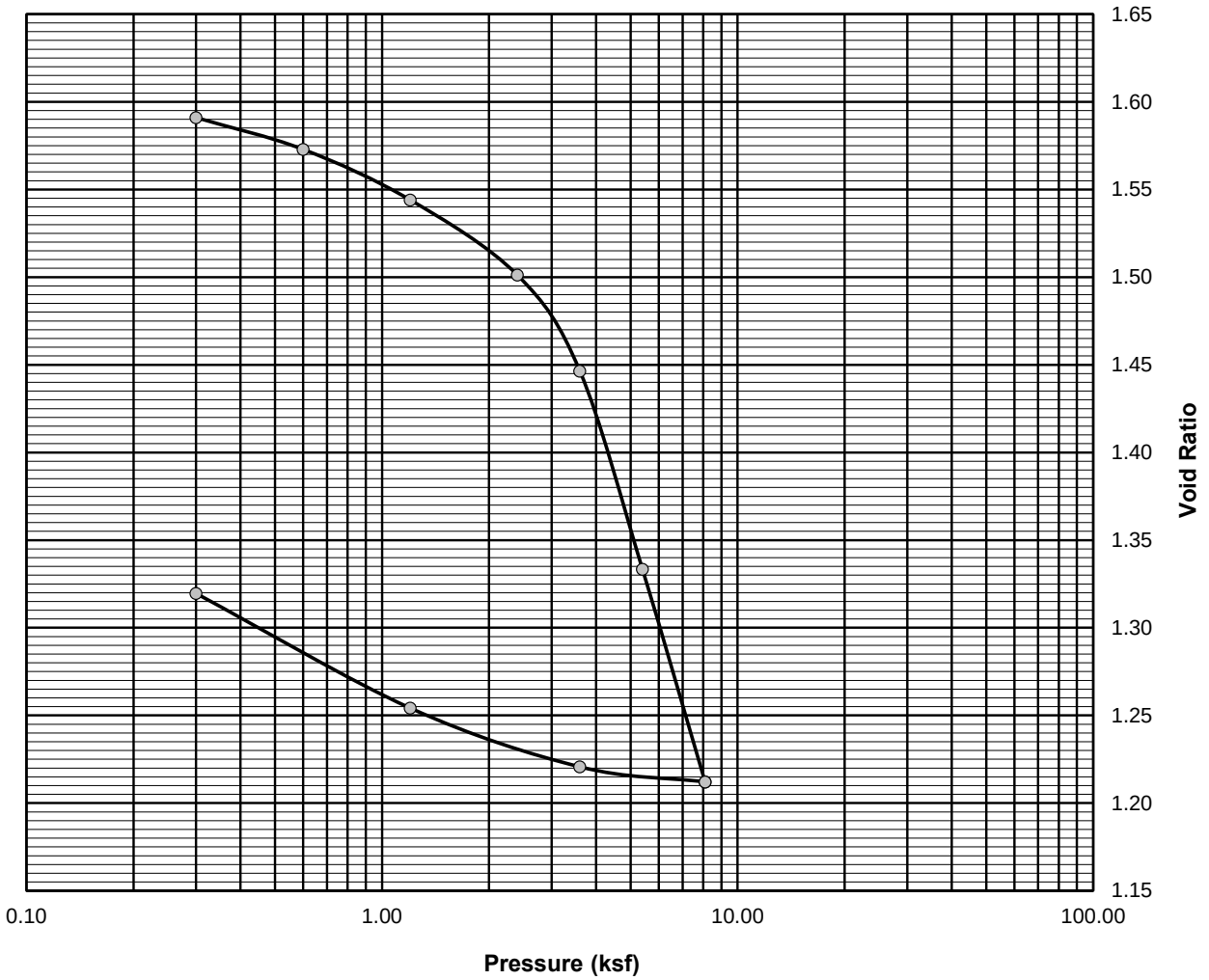
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21269B
Date: 12/29/2017

Boring: B1004
Sample: 3U
Depth: 50-52'

P_C =	3.1	ksf
C_C =	0.67	
C_R =	0.08	
w =	55.4%	
W_L =	55	
W_P =	30	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

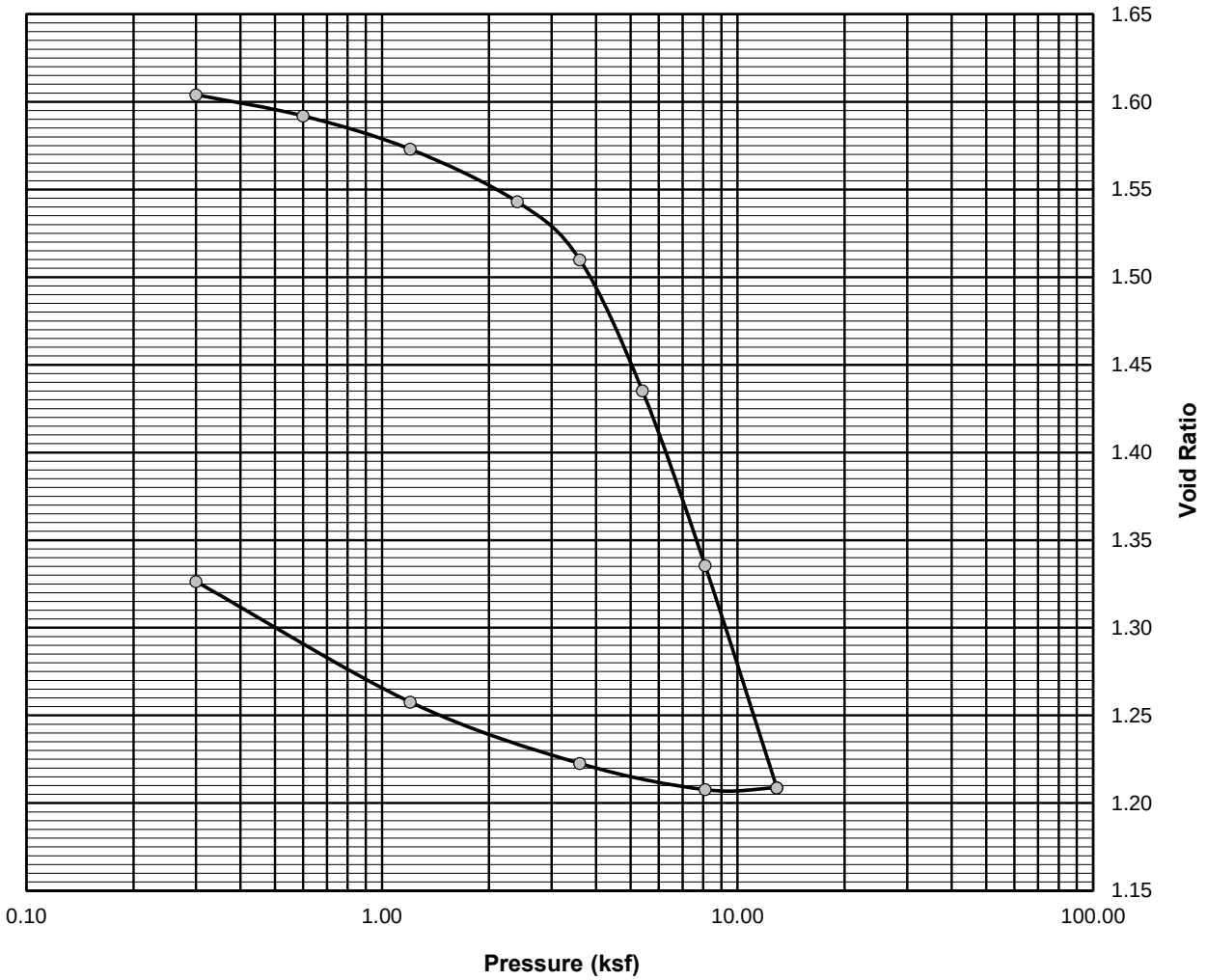
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21270B
Date: 12/29/2017

Boring: B1005
Sample: 1U
Depth: 35-37'

P_C =	3.8	ksf
C_C =	0.60	
C_R =	0.06	
w =	46.5%	
W_L =	49	
W_P =	26	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

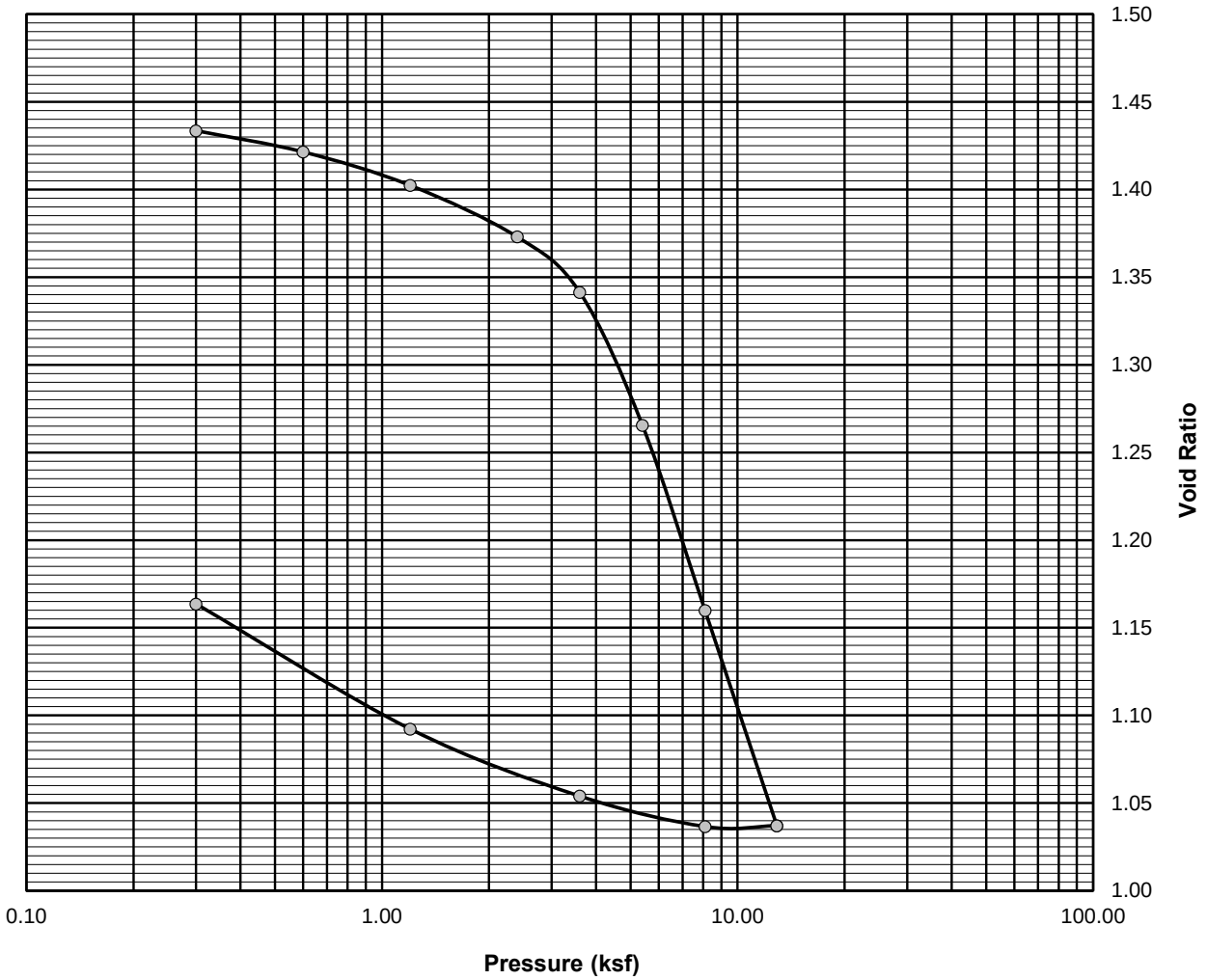
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21271B
Date: 12/29/2017

Boring: B1005
Sample: 2U
Depth: 45-47'

P_C =	4	ksf
C_C =	0.60	
C_R =	0.06	
w =	51.1%	
W_L =	54	
W_P =	29	



Comments:

Reviewed By

S.W.COLE ENGINEERING, INC.

Consolidation Test

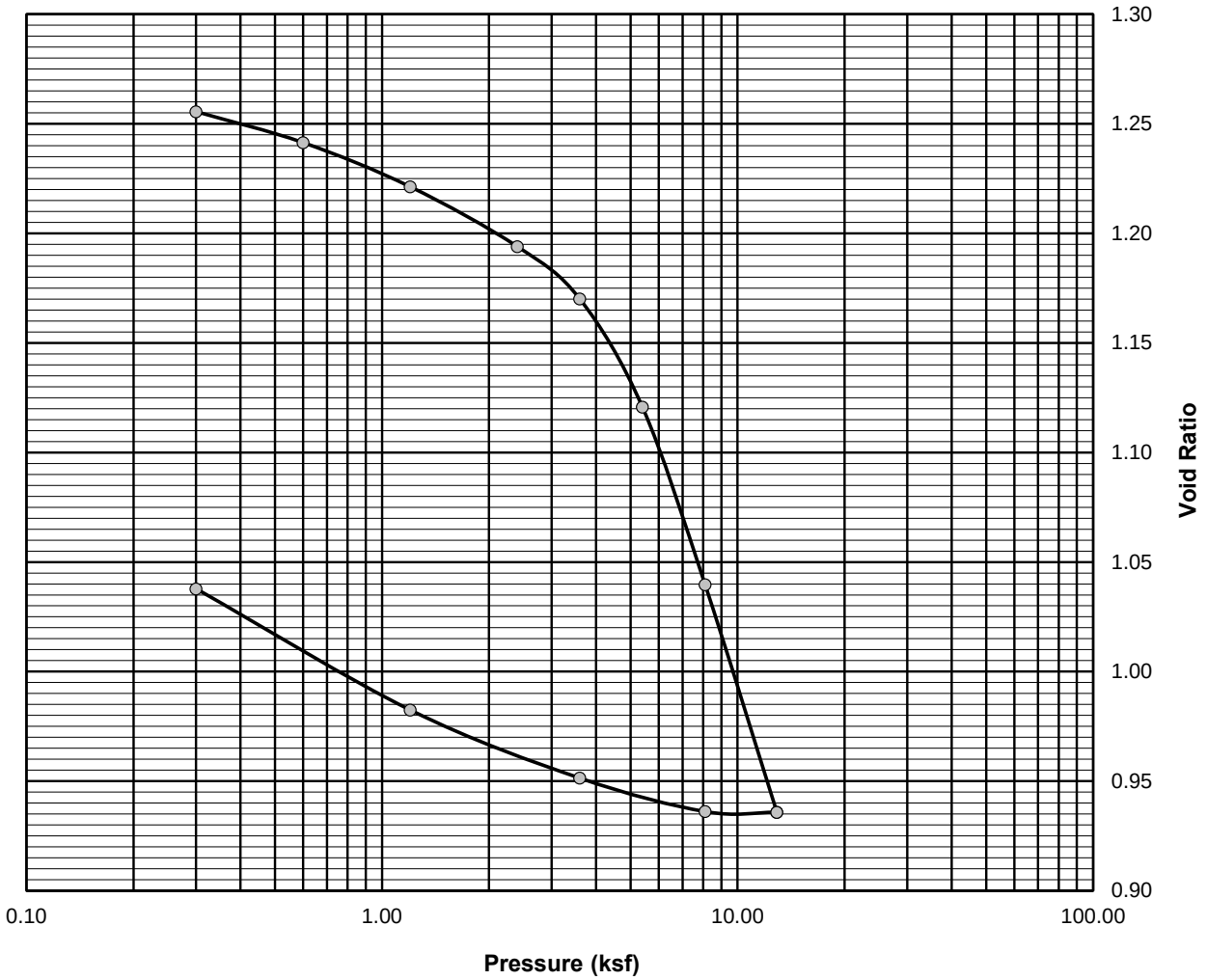
ASTM D-4767

Project Name: Proposed IMT Cold Storage Warehouse
Client: Woodard & Curran, Inc.

Project Number: 16-1314
Lab ID: 21272B
Date: 12/29/2017

Boring: B1005
Sample: 3U
Depth: 55-57'

P_C =	4.3	ksf
C_C =	0.51	
C_R =	0.07	
w =	41.2%	
W_L =	43	
W_P =	24	



Comments:

Reviewed By

ATTACHMENT C: SHEAR WAVE VELOCITY TESTING REPORT

HAGER-RICHTER
GEOSCIENCE, INC.

SHEAR WAVE VELOCITY TESTING
FORMER PORTLAND GAS WORKS SITE
400 COMMERCIAL STREET
PORTLAND, MAINE

Prepared for:

S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way, Suite D10
Salem, New Hampshire 03079

File 17J109
January, 2018

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1. General Site Location
2. pVs Survey Line Locations

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1. Boring Locations and Logs Provided by S.W. Cole

1. INTRODUCTION

Hager-Richter Geoscience, Inc. (Hager-Richter) conducted passive surface shear wave velocity testing at the Former Portland Gasworks Site located at 400 Commercial Street in Portland, Maine in December, 2017 for S. W. Cole Engineering Inc., (S.W. Cole) of Gray, Maine. The geophysical testing was performed as part of a geotechnical investigation of the project site by S.W. Cole.

The site is the location of the former Portland Gasworks located at 400 Commercial Street in Portland. The property is located on the south side of Commercial Street at the intersection with York Street. Figure 1 shows the general location of the site. According to information provide by S.W. Cole, a low temperature warehouse is planned for the vacant Site. Stratigraphy at the Site reportedly consists of fill overlying soft clay and silt to depths of over 100 feet. Bedrock was not encountered in borings installed at the Site. S.W.Cole requested site specific shear wave velocity information as a function of depth for the soil and bedrock to a depth of 100 feet for the determination of seismic site class at the site.

The surface shear wave velocity testing was conducted using the passive shear wave seismic (pVs) method. Figure 2 is a Google Earth image of the site showing the location of the three seismic testing lines specified by S.W. Cole.

Jeffrey Reid, P.G., and Sean Reid of Hager-Richter conducted the seismic testing on December 19, 2017. The project was coordinated with Mr. Tim Boyce, P.E., of S.W. Cole. Mr. Patrick Otto, also of S.W. Cole, was present on site for the fieldwork and specified the pVs line location. Data analysis and interpretation were completed at the Hager-Richter offices. Original data and field notes will be retained in the Hager-Richter files for a minimum of three years.

2. EQUIPMENT AND PROCEDURES

2.1 Method

The passive shear wave seismic (pVs) method is a geophysical method to determine a shear-wave velocity profile at a single location by analyzing a particular type of seismic wave recorded on a multichannel record. The name pVs is derived from p for passive and Vs for velocity of shear waves. The pVs method, also called the Refraction Microtremor method, or ReMi™, uses Rayleigh waves, a particular kind of wave first described by Lord Rayleigh in 1885. Such waves are dispersive (meaning that the velocity is a function of the wavelength), and the amplitude of such waves decreases with depth. The velocity depends primarily on the shear wave velocities and layering of the subsurface material.

Rayleigh waves are a significant part of the ambient subsurface noise at most, if not all, sites. There are many sources of such noise, including, but not limited to, wind, pedestrian and vehicular traffic, surface and subway trains, and construction activities. Although such noise can be troublesome for most seismic methods, it is the source of signals for the pVs method, and the higher the noise level, the better the results for this method.

Low frequency (4.5 Hz) geophones are installed five feet apart along a straight line and connected to a seismograph. The ambient noise is recorded for 30 seconds two or three times, and examined to be sure that noise of sufficiently low frequency is present. If the noise is sufficient, then 10 to 15 such records are acquired. If the noise spectra do not reach sufficiently low frequencies, then one walks or runs along the testing line during data acquisition to add low frequency noise to the ambient noise. The surface waves used in the pVs method, considered noise in seismic refraction and seismic reflection surveys, are enhanced during data acquisition and processing for the pVs method. The seismic data are analyzed using SeisOpt® ReMi™, a commercially licensed software package developed by Optim, Inc. located at the University of Nevada at Reno. Results are normally presented as 1-D plots or in tabular form showing shear wave velocity as a function of depth for the center point of the seismic line.

2.2 Determination of Average Shear Wave Velocity for Building Code Purposes

The pVs method determines (a) the shear wave velocity at the mid point along a survey line for several layers, averaged over the length of the survey line, and (b) the average shear wave velocity V_{avg} for site classification for seismic design in accordance with building codes. Similar calculations can be performed with the results of the shear wave velocity survey. The average value V_{avg} is determined using the equation 16-44 of the IBC as follows:

$$V_{avg} = \left(\sum_{i=1}^{N} d_i \right) / \sum_{i=1}^{N} d_i / V_i$$

where d_i is thickness of layer i
V_i is shear wave velocity of layer i
N denotes the total number of layers

The Seismic Site Class, *based solely on average shear wave velocity*, is defined by the IBC as follows:

Site Class	Soil Profile Name	Soil Shear Wave Velocity (ft/s)
A	Hard rock	$V_s > 5000$
B	Rock	$2500 < V_s \leq 5000$
C	Very dense soil and soft rock	$1200 < V_s \leq 2500$
D	Stiff soil profile	$600 \leq V_s \leq 1200$
E	Soft soil profile	$V_s < 600$

Although the IBC provides other methods to determine the Site Class, such as standard penetration resistance (blow counts) and soil undrained shear strength, this report provides shear wave velocity data only. There is no consideration of other factors that may affect a site class such as liquefaction. The final determination of seismic site class should be made by the project engineer.

2.3 Equipment

We used a 48-channel digital seismograph (Geometrics Geode) coupled to 48 geophones to acquire the pVs data for the subject testing. We used 4.5-Hz frequency vertical geophones for the subject shear wave velocity testing.

2.4 Limitations of the Method

As with all physical measurements, there is experimental error in the velocities that are determined using the passive shear wave velocity method. For the pVs method, the accuracy of V_{avg} is stated by Optim, Inc. to be 5-15%.

The depth of investigation is a function of the noise spectrum, and long wave lengths (low frequencies) are required to determine velocity at large depths. Noise levels can be improved by a person running along the seismic spread during data acquisition.

2.5 Site Specific

The locations of the pVs test lines at the subject site are shown in Figure 2. The position of the pVs testing lines were located using a Trimble Geo 7X CM GPS receiver coupled with a Zephyr-2 external antenna. The pVs data were acquired using 48 4.5Hz geophones and a geophone spacing of 6 feet for Line 1 and 5 feet for Lines 2 and 3. The pVs method yields a simple vertical shear wave velocity profile for the mid-point of the test line. The seismic source for the pVs testing was ambient noise from nearby traffic and activity as well as thumping along the lines with a sledge hammer. Photo 1 shows the general surface conditions encountered.



Photo 1. View looking south along pVs Test Line 3. Geophones were installed into the sand and gravel below the snow. Note the S.W. Cole drill rig in the background.

3. RESULTS AND DISCUSSION

The surface shear wave velocity testing was conducted using the passive shear wave seismic (pVs) method at three test locations specified by S.W. Cole and designated as Lines 1-3. The test locations and center points for the velocity profiles are shown in Figure 2.

According to information provided by S.W.Cole, stratigraphy consists of fill overlying soft clay and silt to depths of over 100 feet. Bedrock was not encountered in borings installed at the Site.

The quality for the pVs data at the subject site is judged to be very good. The results of the pVs testing are reported in Table 1. The pVs results are derived over test lines that span about 200-250 feet, providing an average velocity structure over the length of the test line. However, the borings provide very localized point information. Because of the localized nature of the boring data, no attempt was made to "force" a specific velocity model based on the boring data provided by SW Cole to remove any possible local bias from a point source. For modeling purposes, the subsurface stratigraphy was divided into four or five discrete units. The layer thicknesses that provide the best statistical fit to the dispersion curve are used for the models.

The root mean square error for the fit of the dispersion curves versus the measured data using the model velocities is 1.6% , 1.9%, and 2.9%, respectively, for pVs Lines 1-3. These very low error values indicate that the models fit the data extremely well. While the resulting velocity units do not necessarily correlate with specific lithologic units identified in any individual boring, there is very good general correlation between the generated velocity models the general site-wide stratigraphy.

The shear wave velocities for the individual stratigraphic modeled units are provided in Table 1. The average value of the velocity of shear waves for the depth interval of 0-100 ft based on Equation 1 of the IBC , Vs_{100}, are provided in Table 1 as 650 fps, 667 fps, and 611 fps, respectively, for Lines 1-3.

TABLE 1: pVs TEST RESULTS

Geologic Unit *	Line 1	
	Depth Interval (ft)	**Vs** (ft/s)**
Loose Fill	0 - 10	422
More Dense Fill	10 - 16.5	1,582
Soft Clay and Silt	16.5 - 65	503
More Dense Sand and Silt (Till ?)	65 - 100	1,178
Vs_{100} (ft/s)	650	
RMS	1.6%	
Geologic Unit *	**Line 2**	
	Depth Interval (ft)	**Vs** (ft/s)**
Loose Fill	0 - 11	481
More Dense Fill	11 - 17	1,846
Soft Clay and Silt	17 - 69	537
More Dense Sand and Silt (Till ?)	69 - 100	1,156
Vs_{100} (ft/s)	667	
RMS	1.9%	
Geologic Unit *	**Line 3**	
	Depth Interval (ft)	**Vs** (ft/s)**
Loose Fill	0 - 5	456
Dense Fill	5 - 13	756
Soft Clay and Silt	13 - 52	503
Soft Clay and Silt (cont.)	52 - 80	532
More Dense Sand and Silt (Till ?)	80 - 100	1,657
Vs_{100} (ft/s)	611	
RMS	2.9%	

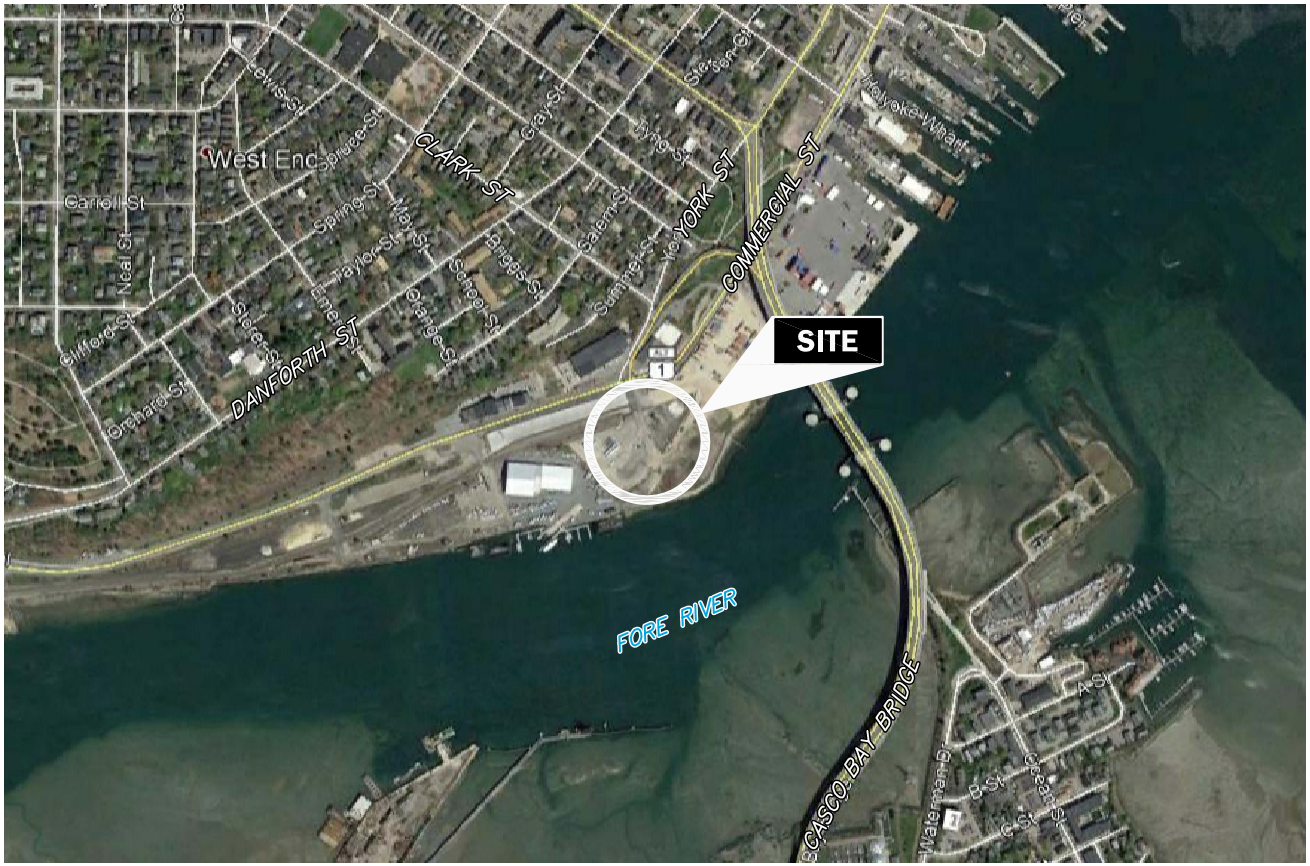
* Part of the description of stratigraphy is based on boring logs provided by S.W. Cole
** Shear wave velocity profile is determined for the mid-point of the testing line

4. LIMITATIONS

This report was prepared for the exclusive use of S. W. Cole Engineering, Inc. (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

H-R has used reasonable care, skill, competence and judgment in the preparation of this Report consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.



N

APPROXIMATE SCALE (feet)

0 1000 2000

ME

LOCATION

NOTE:

Modified from Google Earth Pro aerial photograph.

Figure 1
General Site Location
Former Portland Gasworks Site
Commercial Street
Portland, Maine

File 17J109 | January, 2018

HAGER–RICHTER

Salem, NH | Fords, NJ



N

H-R

LEGEND

pVs TEST LINE WITH MIDPOINT

SCALE (feet)

0 200 400

NOTE:

Modified from Google Earth Pro aerial photograph.

Figure 2
pVs Test Line Locations
Former Portland Gasworks Site
Commercial Street
Portland, Maine

File 17J109 | January, 2018

HAGER–RICHTER
Salem, NH | Fords, NJ

APPENDIX

Boring Location Plan and Logs Provided by S.W. Cole

WEST COMMERCIAL STREET

IMT INTERMODAL TERMINAL ENTRANCE

85+00 86+00 87+00 88+00 89+00

B-1001A B-1001 B-1002 B-1003 B-1004 B-1005

GRADING TO BE DETERMINED

GRADING TO BE DETERMINED

FFE @ LOADING DOCK = 15.00

75' SHORELAND SETBACK

25' SHORELAND SETBACK

DEVELOPABLE AREA: 6.3 ACRES±

APPROX. TOP OF BANK

SPRING HIGH TIDE EL. 7.4

LEGEND:

APPROXIMATE BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=40' SCALE PLAN OF THE SITE ENTITLED "SITE GRADING CONCEPT," PREPARED BY WOODARD & CURRAN, DATED FEBRUARY 2016.
2. THE BORINGS WERE LOCATED IN THE FIELD BY MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 40 80 Feet

S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

EXPLORATION LOCATION PLAN

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	1" = 40'
Date :	01/05/2018	Sheet:	1

R:\2016\16-1314\CAD\Drawings\16-1314-EP.dwg, 1/5/2018 2:53:32 PM, 11, CEM, S. W. Cole Engineering, Inc.

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001
SHEET: 1 of 1
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 14' +/- | **TOTAL DEPTH (FT):** 25.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 4 ft 12/20/2017 Free water at 4'
GENERAL NOTES: Backfilled borehole with bentonite and drill cuttings.

KEY TO NOTES AND SYMBOLS: Water Level; ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0.5-2.5	24/18	13-9-7-8			Medium dense, brown silty gravelly SAND (FILL)		
										2.0 Medium dense to loose, black gravel, some silt, some sand with wood (FILL) -petroleum odor	▽	
10	5		2D		5-7	24/12	5-4-6-4					
5	10		3D		10-12	24/12	4-3-4-3			-petroleum odor and sheen below 10'		
0	15		4D		15-17	24/10	3-3-4-3			FILL and coal tar		
-5	20		5D		20-21.8	21/5	8-7-6-50/3"			21.5 Concrete 22.0 Coal tar in casing prevented further drilling		
-10	25									25.0 Bottom of Exploration at 25.0 feet Abandoned hole at 25', excessive coal tar		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1001

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001A
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 14' +/- | **TOTAL DEPTH (FT):** 52.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 5 ft 12/20/2017 Soils saturated below 5'
GENERAL NOTES: Moved boring 25' +/- west of B-1001. Backfilled borehole with bentonite and drill cuttings.

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
										Brown-black gravelly silty SAND with brick (FILL)	▽	
10	5											
5	10											
0	15		1D		15-17	24/12	9-6-4-7			-petroleum odor and sheen		
-5	20		2D		20-22	24/22	WOH FOR 12"-2-3	w =31.2 % O =2.0%		19.0 Very loose to loose, gray SAND and silt, some clay with shells (Bay Mud)		
-10	25		3D		25-27	24/20	2-4-3-3			24.0 Loose to medium dense, gray SAND and silt with frequent silty clay layers		
-15	30		4D		30-32	24/18	3-5-5-6	w =24.5 %				
-20	35		5D		35-37	24/2	4-3-10-9					
-25												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1001A

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1001A
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/20/2017
DATE FINISH: 12/20/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			6D		40-42	24/24	4-3-4-6	w =19.4 %		Loose to medium dense, gray silty SAND with clay layers		
-30	45		7D		45-47	24/24	WOH FOR 12"-5-5					
-35	50		8D		50-52	24/18	7-11-11-12	w =21.2 %		49.0 Medium dense, brown silty SAND with clay layers		
										52.0 Bottom of Exploration at 52.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1001A

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1002
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/27/2017
DATE FINISH: 12/27/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 12' +/- | **TOTAL DEPTH (FT):** 52.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.79 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 7 ft 12/27/2017 Soils saturated below 7'
GENERAL NOTES: Backfilled borehole with bentonite to 16' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Concrete		
										1.1 Loose, brown silty SAND (FILL)		
10			1D		3-5	24/126	4-4-3-2					
	5		2D		5-7	24/15	4-4-4-4					
5										6.5 Loose, black silty SAND (FILL) -petroleum odor	▽	
	10		3D		10-12	24/14	4-7-9-6			9.0 Medium dense, gray gravelly SAND, some silt -petroleum odor		
0												
	15		4D		15-17	24/11	4-1-1-1	w =28.8 % O =1.9%		14.0 Very loose, gray silty SAND with organics -petroleum odor and sheen		
-5												
	20		5D		20-22	24/14	2-5-7-13			19.0 Medium dense, gray silty gravelly SAND		
-10												
	25		6D		25-27	24/14	3-3-9-7	w =25 %		24.0 Medium dense to loose, light brown silty SAND with silty clay layers		
-15												
	30		7D		30-32	24/12	4-8-8-7					
-20												
	35		8D		35-37	24/20	5-4-6-6	w =22.4 %				
-25												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1002

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1002
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/27/2017
DATE FINISH: 12/27/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-30	45		9D		40-42	24/18	6-4-2-5			40.0 Loose, gray silty SAND, some gravel with silty clay layers		
-35	50		10D		50-52	24/14	4-8-18-19	w =23.1 %		45.0 Medium dense, gray SAND and silt		
-40										52.0 Bottom of Exploration at 52.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1002

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT:	Woodard & Curran
PROJECT:	Proposed IMT West Cold Storage Facility
LOCATION:	West Commercial Street, Portland, Maine

BORING NO.:	**B-1003**
SHEET:	1 of 2
PROJECT NO.	16-1314
DATE START:	12/21/2017
DATE FINISH:	12/21/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 12' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto

DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring

RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 300 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**

HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16

WATER LEVEL DEPTHS (ft): ▽ 4.5 ft 12/21/2017 Free water at 4.5'

GENERAL NOTES: Moved borehole 8-10' west after drilling through concrete at 4-5' and void from 5-10'. Backfilled borehole with bentonite to 16' below ground surface.

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10										Medium dense, black-brown silty gravelly SAND with brick (FILL) -Petroleum odor at 5-7'		
	5		1D		5-7	24/19	5-12-8-3				▽	
5												
	10		2D		10-11.5	18/7	1-1-1-25/0"			Very loose		
0										11.5 Concrete		
	15		3D		15-17	24/13	6-12-12-16			13.0 Medium dense, black sandy SILT with ash (FILL) -Petroleum odor and sheen		
-5												
	20		4D		20-22	24/9	6-6-4-3	w =22.6 % O =1.7%		19.0 Medium dense to loose, gray-brown silty SAND with wood		
-10												
	25		5D		25-27	24/15	WOH-1-1-1	w =39.7 % O =2.8%		Very loose, gray sandy SILT with shells and organics (Bay Mud)		
-15												
	30		6D		30-32	24/24	WOH FOR 24"			29.0 Medium to stiff, gray silty CLAY with shells and organics to 32'		
-20												
	35		1U		35-37	24/24		W_L=55 W_P=30				
-25			1V	PP	37-37.5	6		S_V=1.55/0.31ksf				
			1V'	PP	37.5-38	6		S_V=1.61/0.31ksf				

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1003

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1003
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/21/2017
DATE FINISH: 12/21/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Medium to stiff, gray silty CLAY		
-30												
	45		2U		45-47	24/24						
								W_L=55 W_P=27				
-35			2V		47-47.5	6		S_V=1.92/0.43ksf				
			2V'		47.5-48	6		S_V=2.11/0.62ksf				
	50											
-40												
	55		3U		55-57	24/24						
								W_L=48 W_P=25				
-45			3V		57-57.5	6		S_V=1.61/0.43ksf				
			3V'		57.5-58	6		S_V=1.92/0.43ksf				
	60		7D		60-62	24/24	WOH-WOH FOR 12"-2			59.0 Very loose, gray SAND and silt with shells and wood		
-50												
	65		8D		65-67	24/24	1-1-2-2	w =23.6 %				
-55												
	70		9D		70-72	24/19	7-16-21-22	w =16.5 %		69.0 Dense, gray fine to medium SAND, some gravel, some silt		
-60												
	75											
-65												
	80		10D		80-82	24/21	8-18-20-29	w =20.6 %		79.0 Dense, gray silty fine to medium SAND		
-70										82.0 Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1003

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1004
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/18/2017
DATE FINISH: 12/18/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 10' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 8 ft 12/18/2017 Soils wet 5-7' and saturated below 8'.
GENERAL NOTES: Backfilled borehole with bentonite to 22' below ground surface.

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/16	5-5-6-6			Medium dense, brown-gray-black silty gravelly SAND (FILL)		
5	5		2D		5-7	24/8	4-1-1-1			5.5 Very loose, gray SAND and silt, some clay with shells (FILL) -naphthalene odor	▽	
										8.0 Loose, brown-black silty SAND and gravel (FILL) -petroleum sheen and naphthalene odor		
0	10		3D		10-12	24/10	5-3-6-6					
-5	15		4D		15-17	24/12	2-3-2-2					
-10	20		5D		20-22	24/13	1-2-1-1	w =31 % O =1.8%		19.0 Very loose, gray SILT and sand, trace gravel with shells, organics (Bay Mud)		
-15	25		6D		25-27	24/24	WOH FOR 24"	w =48.3 % O =2.9%		24.0 Medium to stiff, gray silty CLAY with sand layers/seams		
-20	30		1U		30-32	24/12		W_L=47 W_P=28 w =53.4 % S_V=1.05/0.27ksf S_V=1.09+ksf				
			1V		32-32.7	8						
			1V'		32.7-33.4	8						
-25	35											

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1004

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1004
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/18/2017
DATE FINISH: 12/18/2017

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			2U		40-42	24/24		W_L=53 W_P=29 w =54.6 %				
			2V		42-					could not advance vane		
-35	45									Medium to stiff, gray silty CLAY with occasional sand layers		
-40	50		3U		50-52	24/24		W_L=55 W_P=30 w =55.4 %				
			3V		52-					could not advance vane		
-45	55											
-50	60		7D		60-62	24/24	3-4-2-8	w =25.7 %		60.5 Loose, gray silty SAND with shells and wood		
-55	65		8D		65-67	24/14	3-6-4-3			64.5 Medium dense to loose, gray silty medium to coarse SAND with wood and occasional silty clay seams/layers		
-60	70		9D		70-72	24/18	WOR-5-8-15	w =21.7 %		69.0 Medium dense, gray SAND and silt with silty clay layers		
-65	75											
-70	80		10D		80-82	24/16	5-10-9-19	w =21 %		82.0 Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1004

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

S.W.COLE ENGINEERING, INC.

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1005
SHEET: 1 of 2
PROJECT NO. 16-1314
DATE START: 12/19/2017
DATE FINISH: 12/19/2017

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 11' +/- | **TOTAL DEPTH (FT):** 82.0 | **LOGGED BY:** Patrick Otto
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Jeff Lee | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted CME 850 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER EFFICIENCY FACTOR: 0.81 | **HAMMER DROP (inch):** 30 / 16
WATER LEVEL DEPTHS (ft): ▽ 8 ft 12/19/2017 Soils saturated below 8'
GENERAL NOTES: Backfilled borehole with bentonite to 19' below ground surface.

KEY TO NOTES AND SYMBOLS: Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
10			1D	SS	0-2	24/16	3-6-11-18			Medium dense to very loose, brown-black silty gravelly SAND with brick (FILL) -petroleum odor and sheen below-		
5	5		2D	SS	5-7	24/18	13-15-6-8				▽	
0	10		3D	SS	10-12	24/18	1-2-1-2					
										11.0 Very loose to medium dense, gray SAND and silt, some gravel with shells and wood (Bay Mud)		
-5	15		4D	SS	15-17	24/7	2-1-1-3					
-10	20		5D	SS	20-22	24/16	4-6-5-6	w =25.5 % O =1.2%				
-15	25		6D	SS	25-27	24/1	6-4-2-2			Cobble at 24'		
										28.0 Medium to stiff, gray silty CLAY with sand layers/seams		
-20	30		7D	SS	30-32	24/5	1-1-2-3	w =38.9 % O =2.0%				
-25	35		1U	TW	35-37	24/24		W_L=49 W_P=26 w =46.5 % S_V=2.05/0.31ksf				
			1V	FB	37-37.5	6		S_V=1.86/0.31ksf				
			1V'	FB	37.5-38	6						

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING NO.: B-1005

BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

BORING LOG

CLIENT: Woodard & Curran
PROJECT: Proposed IMT West Cold Storage Facility
LOCATION: West Commercial Street, Portland, Maine

BORING NO.: B-1005
SHEET: 2 of 2
PROJECT NO. 16-1314
DATE START: 12/19/2017
DATE FINISH: 12/19/2017

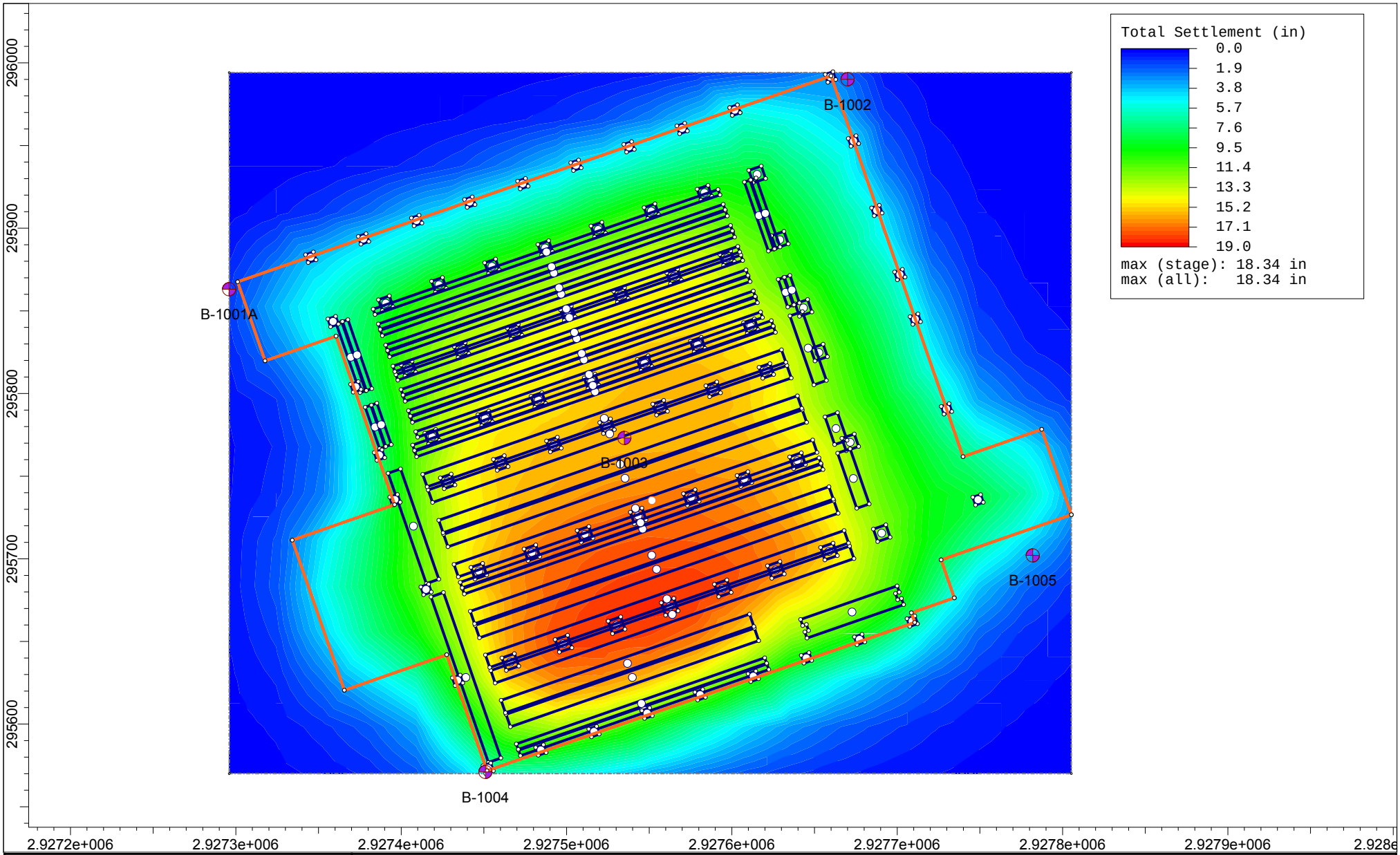
Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
-30										Medium to stiff, gray silty CLAY with sand layers/seams		
	45		2U		45-47	24/22		W_L=54 W_P=29				
-35			2V	PP	47-47.5	6		w =51.1 % S_V=2.17/0.43ksf				
			2V'		47.5-48	6		S_V=2.17/0.62ksf				
	50											
-40												
	55		3U		55-57	24/21		W_L=43 W_P=24				
-45			3V	PP	57-57.5	6		w =41.2 % S_V=2.05/0.56ksf				
			3V'		57.5-58	6		S_V=2.17/0.50ksf				
	60									59.0		
-50			8D		60-62	24/18	4-3-4-5	w =23 %		Loose to medium dense, gray silty fine to coarse SAND with wood and pinecones		
	65		9D		65-67	24/16	6-7-11-15					
-55												
										69.0		
	70		10D		70-72	24/10	5-5-5-2	w =21.1 %		Loose to medium dense, gray SAND, some silt, some gravel		
-60												
										75.0		
	75									Medium dense, gray silty SAND		
-65												
	80		11D		80-82	24/18	2-5-11-13	w =21 %				
-70										82.0		
										Bottom of Exploration at 82.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-1005

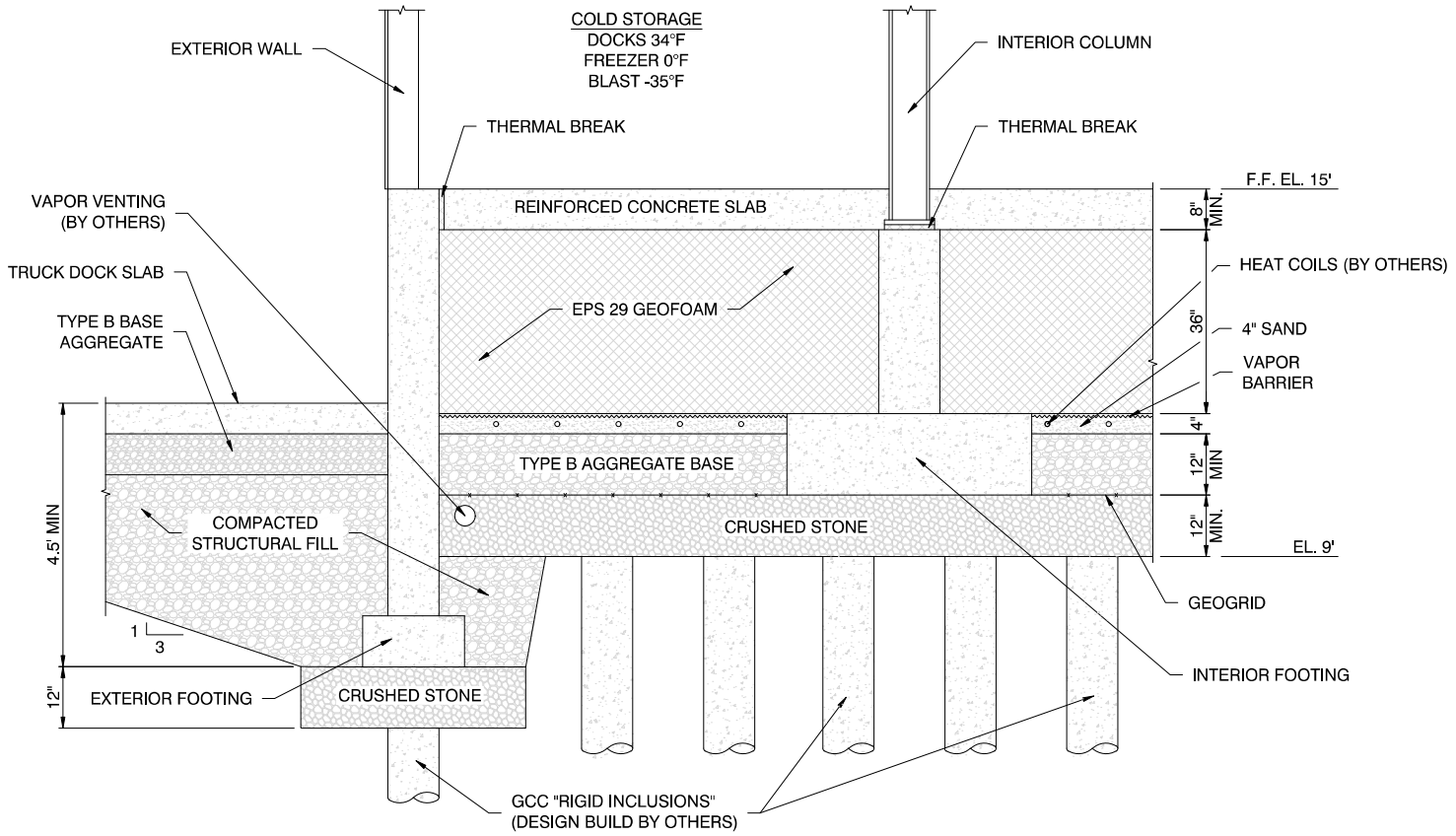
BORING / WELL 16-1314.GPJ SWCE TEMPLATE.GDT 1/29/18

ATTACHMENT D: GRAPHICAL MODEL OF POTENTIAL TOTAL SETTLEMENT



SETTLE3D 4.014	*Project*	Proposed IMT West Cold Storage Facility	
	Analysis Description		
	Drawn By	EJB	*Company* S.W. Cole Engineering
	Date	1/26/2018, 1:38:56 PM	*File Name* IMT Site.s3z

ATTACHMENT E: FOUNDATION DETAIL SKETCHES



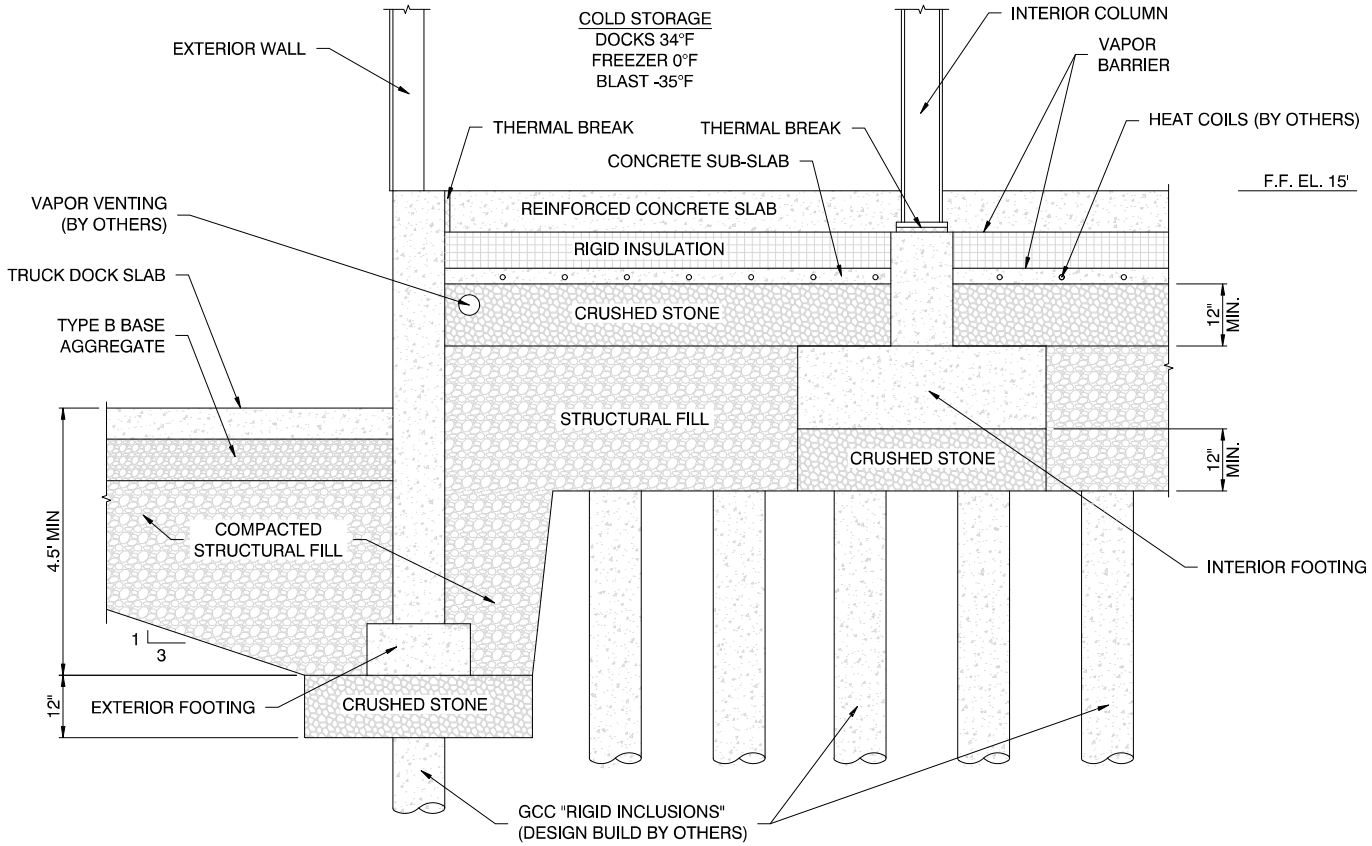
S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	1



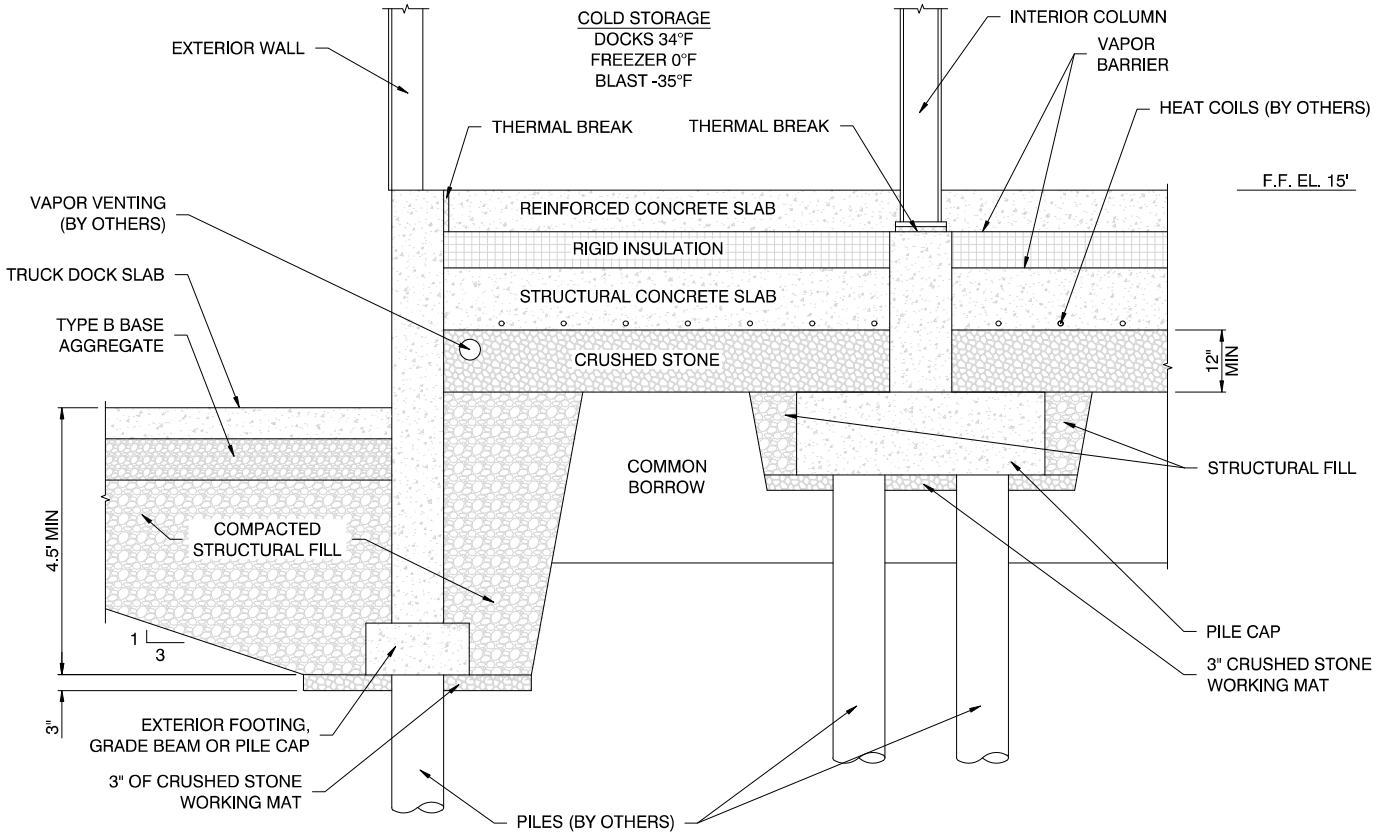
S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	2



S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	3

ATTACHMENT F: BUDGET ESTIMATE SUMMARIES

Option 1: Geopier GeoConcrete Columns (GCC)

Budget Estimate Summary

Maine Port Authority - Cold Storage Site Preparation (GCC Option #1)

Woodard & Curran
41 Hutchins Drive
Portland, Maine 04102

Date: 4/2/2018
Time: 10:53 AM
Project No.: 229064.02

		Labor	Material	Equipment	Subcontract	Temp Matl	Equip Rental	Other	Totals
Direct Construction Cost	%								
Base labor		$283,890	$1,366,448	$364,182	$4,905,151	$0	$0	$0	$6,919,671
Labor burden	35.00%	$99,361							$99,361
Labor fringes		$82,488							$82,488
Labor manhours		3,486							
Material sales tax	0.00%		$0						$0
Equipment shipping	3.50%			$12,746					$12,746
Temporary material markup	0.00%					$0			$0
Equipment rental markup	0.00%						$0		$0
Other markup	0.00%							$0	$0
Gross Construction Cost		$465,739	$1,366,448	$376,928	$4,905,151	$0	$0	$0	$7,114,267
General liability insurance	0.85%		$74,035						$74,035
Builder's risk insurance	0.15%		$13,065						$13,065
	Overall								
Contractor Overhead	0.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
	$0	$46,574	$145,355	$37,693	$490,515	$0	$0	$0	$720,137
Contractor Profit	0.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	
	$0	$37,259	$116,284	$30,154	$392,412	$0	$0	$0	$576,109
P&P Bond	$141,245		$141,245						$141,245
Site Safety	1.00%	$71,143							$71,143
Total Construction Cost		$620,715	$1,856,432	$444,776	$5,788,078	$0	$0	$0	$8,710,000
Civil & Site Engineering									$0
Geotechnical Engineering									$0
Permitting									$0
Construction Administration									$0
Sub-Total									**$8,710,000**
Project Contingency	15%								$1,307,000
Project Total									**$10,017,000**

Recap - With Taxes and Insurance

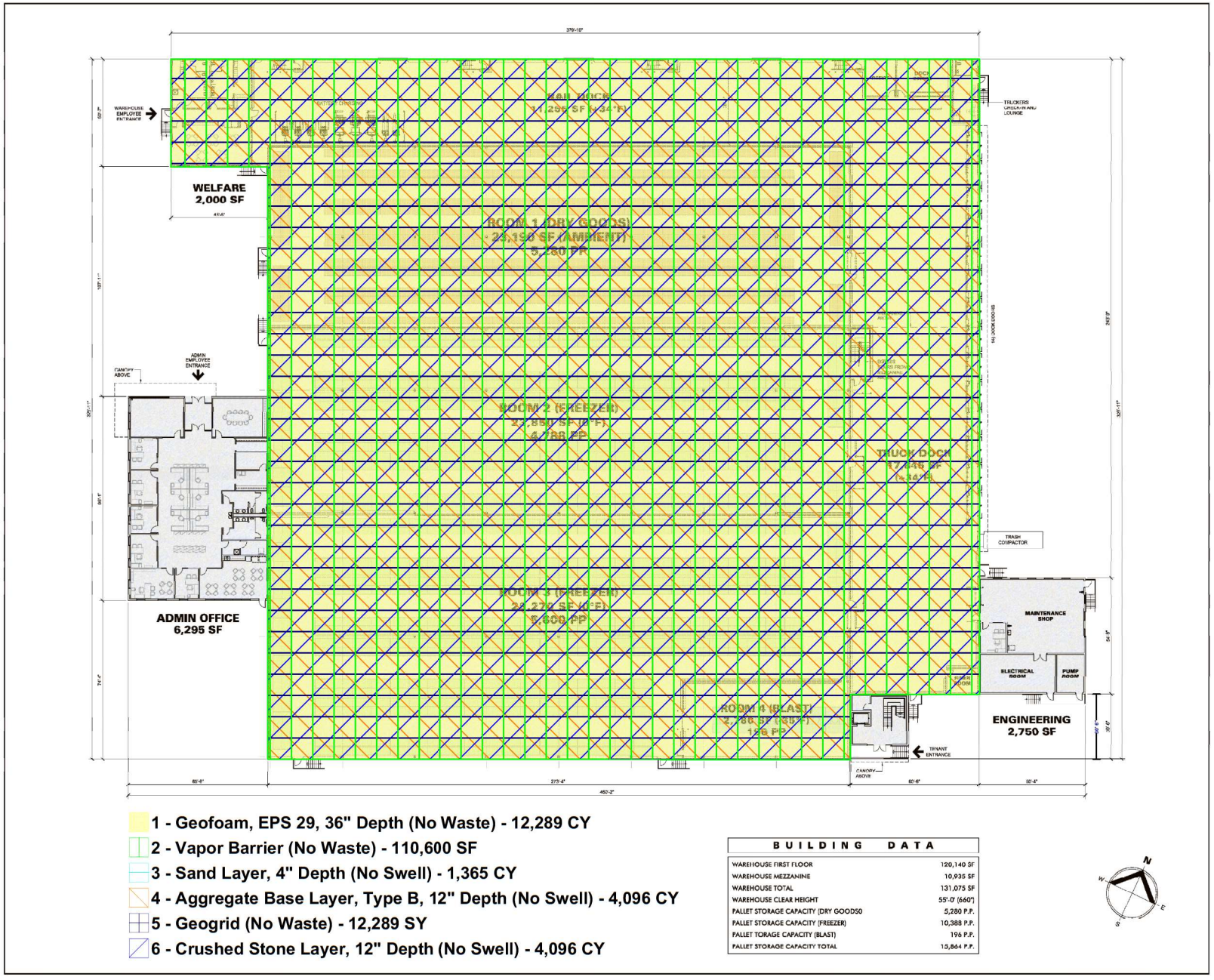
Group 1: Divisions
Group 2: Major ItemCode Groups

Estimator : John Brockington
Project Size : 0 SQFT

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements			**116,626.46**	**12,459.08**	**402.00**	**8,953.99**			**138,442**
Quality requirements					**15,000.00**				**15,000**
Temporary facilities and controls			**742.50**	**10,529.75**	**267.00**	**4,190.97**			**15,730**
Execution requirements				**972.00**	**2,947.50**				**3,920**
*** Total General Conditions**	**1.00**	**LS**	**117,368.96**	**23,960.83**	**18,616.50**	**13,144.97**		**173,091.26**	**173,091**
Sitework									
Site preparation			**21,707.16**	**3,775.06**		**41,535.52**			**67,018**
Earthwork			**235,716.66**	**281,772.20**	**1,377,600.00**	**322,247.98**			**2,217,337**
Foundations			**90,946.31**	**1,056,940.00**	**3,508,934.76**				**4,656,821**
*** Total Sitework**	**1.00**	**LS**	**348,370.13**	**1,342,487.26**	**4,886,534.76**	**363,783.50**		**6,941,175.65**	**6,941,176**
Total Gross Cost			**465,739.09**	**1,366,448.09**	**4,905,151.26**	**376,928.47**			**7,114,267**

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements									
Mobilize/Demobilize	1.00	LS	5,062.46	896.00		8,953.99		14,912.45	14,912
Project Manager	6.00	WEEK	22,680.00					3,780.00	22,680
Project Superintendent	14.00	WEEK	49,140.00					3,510.00	49,140
Field Engineer	12.00	WEEK	29,808.00					2,484.00	29,808
Safety Engineer	4.00	WEEK	9,936.00					2,484.00	9,936
Permit (Allowance)	1.00	LS		9,345.79				9,345.79	9,346
Purchase drawings	1.00	LS		467.29				467.29	467
Travel expenses	14.00	WEEK		1,750.00				125.00	1,750
Progress photographs	3.00	MO			402.00			134.00	402
**** Total Administrative requirements**			**116,626.46**	**12,459.08**	**402.00**	**8,953.99**			**138,442**
Quality requirements									
Testing (Allowance)	1.00	LS			15,000.00			15,000.00	15,000
**** Total Quality requirements**					**15,000.00**				**15,000**
Temporary facilities and controls									
Job telephone	3.00	MO		1,050.00				350.00	1,050
Electrical energy costs	3.00	MO		1,350.00				450.00	1,350
Water usage costs	3.00	MO		300.00	267.00			189.00	567
Office trailer	3.00	MO		1,350.00				450.00	1,350
Storage trailer(s)	3.00	MO		375.00				125.00	375
Temporary toilets	3.00	MO		1,020.00				340.00	1,020
Water, ice and cups	3.00	MO		427.50				142.50	428
First aid supplies	3.00	MO		150.00				50.00	150
Safety supplies	3.00	MO		456.75				152.25	457
Office supplies	3.00	MO		250.50				83.50	251
Small tools	3.00	MO				520.86		173.62	521
Gasoline and lubricating oil	800.00	GALS		2,800.00				3.50	2,800
Automobile	1.50	MO				931.50		621.00	932
Pick-up truck	3.00	MO				2,738.61		912.87	2,739
Job sign	2.00	EACH	742.50	1,000.00				871.25	1,743
**** Total Temporary facilities and controls**			**742.50**	**10,529.75**	**267.00**	**4,190.97**			**15,730**
Execution requirements									
Layout supplies	12.00	WEEK		972.00				81.00	972
Rubbish removal	180.00	CUYD			2,947.50			16.38	2,948
**** Total Execution requirements**				**972.00**	**2,947.50**				**3,920**
*** Total General Conditions**	**1.00**	**LS**	**117,368.96**	**23,960.83**	**18,616.50**	**13,144.97**		**173,091.26**	**173,091**
Sitework									
Site preparation									
Erosion control	1,500.00	LNFT	2,768.50	1,045.80				2.54	3,814
Rough grading	2.54	ACRE	4,673.26	2,089.26		4,619.08		4,482.66	11,382
Dewatering pumps	2.00	EACH	5,272.87			33,000.00		19,136.43	38,273
Dewatering sumps	100.00	LNFT	8,992.53	640.00		3,916.44		135.49	13,549
**** Total Site preparation**			**21,707.16**	**3,775.06**		**41,535.52**			**67,018**
Earthwork									
Site cut to waste (Assumed Qty)	22,400.00	CUYD	53,218.14	23,793.28		79,836.42		7.00	156,848

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
Haul excavated material 8-10 miles (Assumed QTY)	33,600.00	TONS	63,852.60	11,299.68		112,935.06		5.60	188,087
Contaminated soil disposal	33,600.00	TONS			1,377,600.00			41.00	1,377,600
Compact subgrade	110,600.00	SQFT	28,493.33	12,741.12		28,171.31		0.63	69,406
Vapor barrier	121,660.00	SQFT	21,286.24	3,090.16				0.20	24,376
Sand fill layer, 4" depth	1,844.00	CUYD	7,376.36	12,357.93		13,453.49		18.00	33,188
Type B aggregate base layer, 12" depth	5,530.00	CUYD	25,286.84	72,387.15		46,119.79		26.00	143,794
Geogrid soil stabilization	12,290.00	SQYD	13,900.67	45,254.24		1,055.77		4.90	60,211
Crushed stone layer, 12" depth	5,120.00	CUYD	22,302.49	100,848.64		40,676.13		32.00	163,827
**** Total Earthwork**			**235,716.66**	**281,772.20**	**1,377,600.00**	**322,247.98**			**2,217,337**
Foundations									
Geopier GCC Ground Improvement	118,000.00	SQFT			3,400,004.80			28.81	3,400,005
Geofoam, EPS 29	12,290.00	CUYD	90,946.31	1,056,940.00	108,929.96			102.26	1,256,816
**** Total Foundations**			**90,946.31**	**1,056,940.00**	**3,508,934.76**				**4,656,821**
*** Total Sitework**	**1.00**	**LS**	**348,370.13**	**1,342,487.26**	**4,886,534.76**	**363,783.50**		**6,941,175.65**	**6,941,176**
Total Gross Cost			**465,739.09**	**1,366,448.09**	**4,905,151.26**	**376,928.47**			**7,114,267**



BUILDING DATA	
WAREHOUSE FIRST FLOOR	120,140 SF
WAREHOUSE MEZZANINE	10,935 SF
WAREHOUSE TOTAL	131,075 SF
WAREHOUSE CLEAR HEIGHT	55'-0" (660")
PALLET STORAGE CAPACITY (DRY GOODS0	5,280 P.P.
PALLET STORAGE CAPACITY (FREEZER)	10,388 P.P.
PALLET TORAGE CAPACITY (BLAST)	196 P.P.
PALLET STORAGE CAPACITY TOTAL	15,864 P.P.

SUBMITTALS / REVISIONS

No.	DESCRIPTION	DATE	BY
1	ISSUE FOR REVIEW / PRICING	02/10/16	DGRAY
2	RFP SUBMITTAL DRAWINGS	09/01/16	DGRAY

PRELIMINARY DRAWING: ■
RFP DRAWING: □
CONSTRUCTION DRAWING: □
AS-BUILT DRAWING: □

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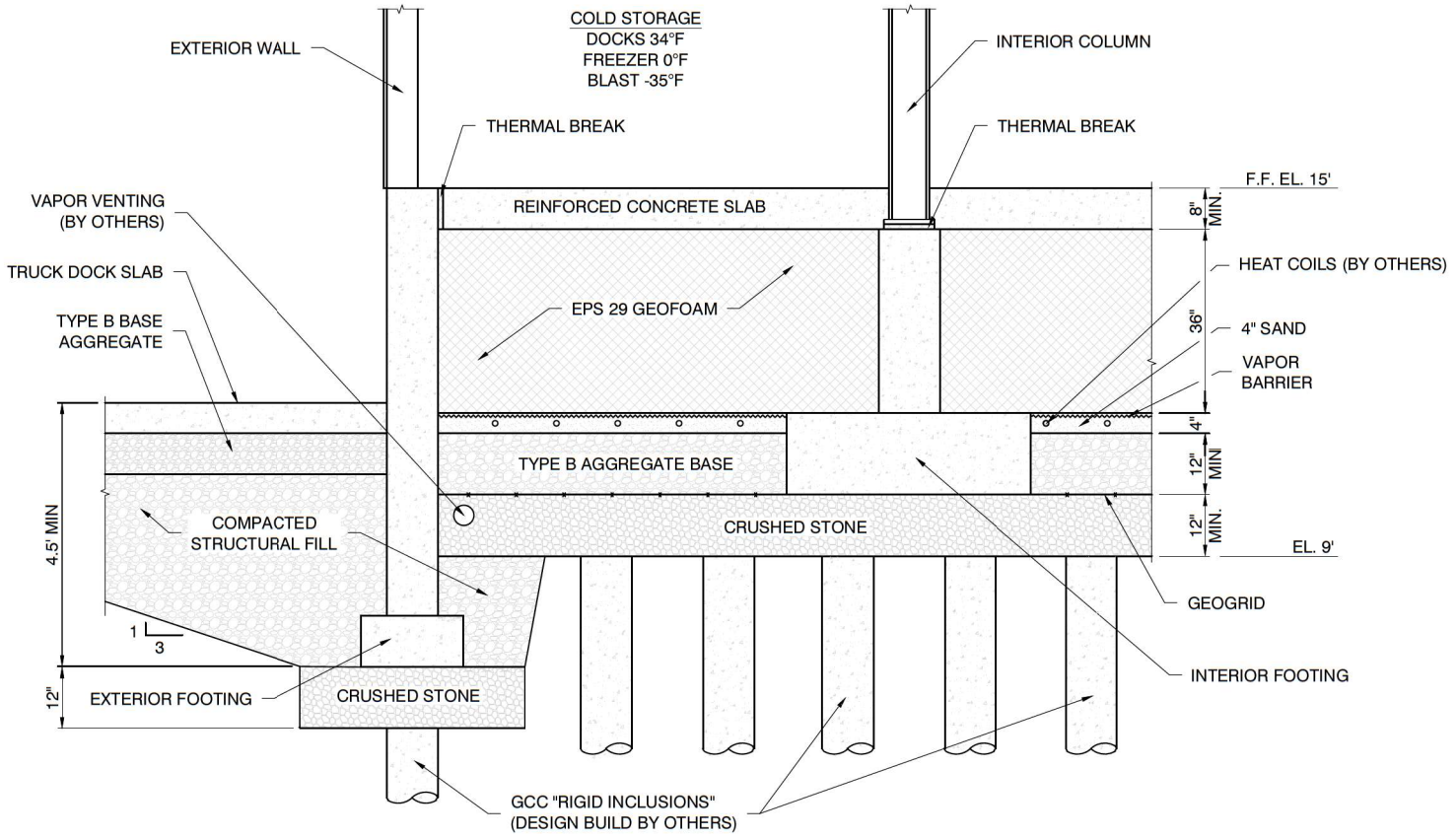
10 Glenlake Parkway
South Tower, Suite 600
Atlanta, GA 30328
Ph: (678) 441-1400
Fax: (678) 441-6824
Web: www.americold.com

PROJECT
MAINE PORT AUTHORITY
PROPOSAL FOR
IMT WEST
COLD STORAGE FACILITY
460 COMMERCIAL STREET
PORTLAND, ME 04101

DRAWING
BUILDING FLOOR PLAN
PROPOSED WAREHOUSE

PROJECT No:	1533	DRAWN:	DGRAY
DATE:	09/09/2016	CHECKED:	KHH
SCALE:	AS NOTED		

DRAWING No:
A201



S.W.COLE ENGINEERING, INC.

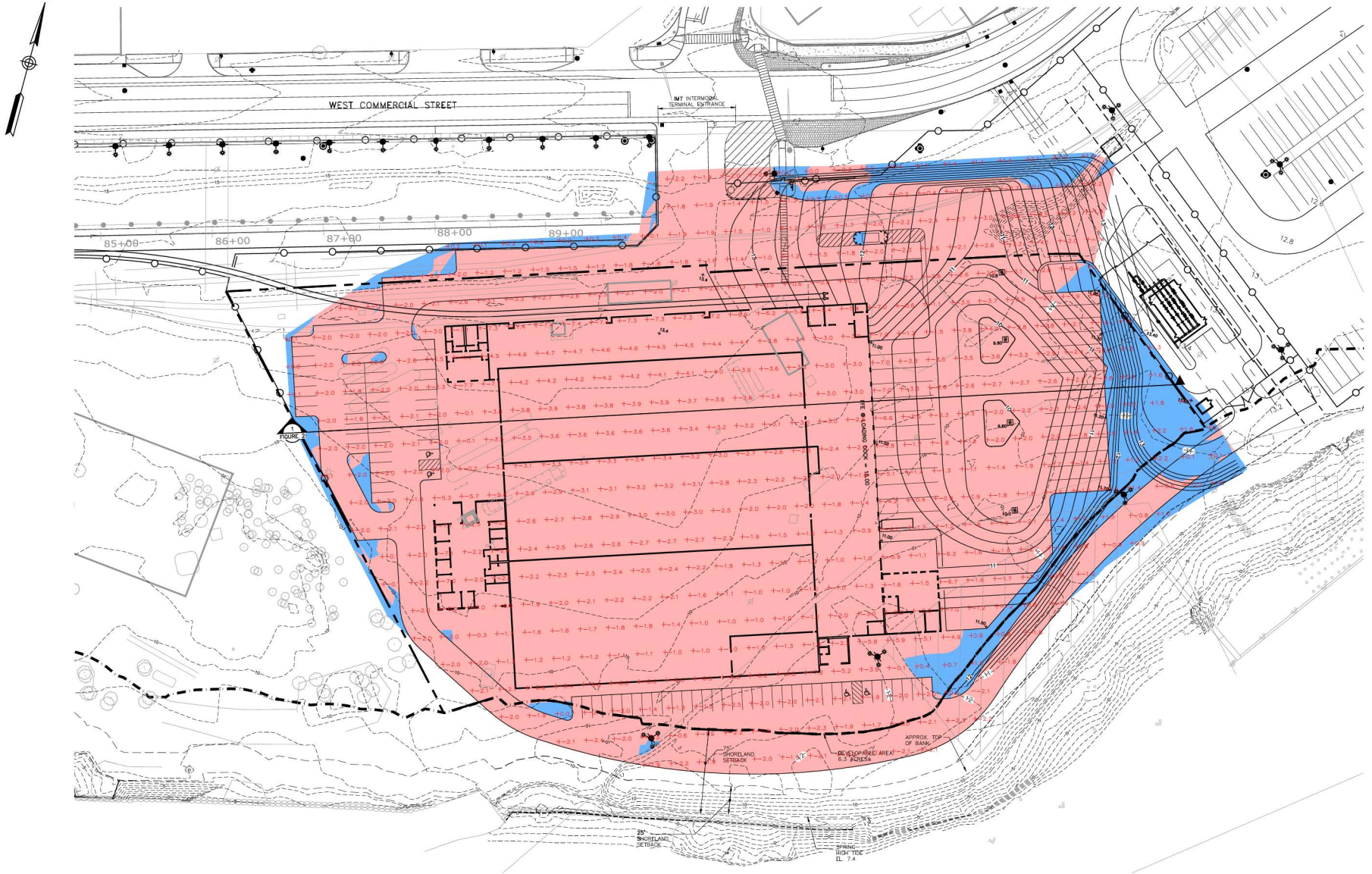
WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	2

R:\2016\16-1314\CAD\Drawings\16-1314 Detail.dwg, 2/14/2018 3:04:03 PM, 1:1, CEM, S. W. Cole Engineering, Inc.



Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
VOL EG vs EXCAVATION	1.000	1.000	340699.59 Sq. Ft.	28802.37 Cu. Yd.	993.21 Cu. Yd.	27809.16 Cu. Yd.<Cut>
Totals			340699.59 Sq. Ft.	28802.37 Cu. Yd.	993.21 Cu. Yd.	27809.16 Cu. Yd.<Cut>

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

DRAFT - NOT FOR CONSTRUCTION

MAINE PORT AUTHORITY

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REV	DESCRIPTION	DATE
	DESIGNED BY: DAS/ BDM	CHECKED BY: DAS
	DRAWN BY: BDM	23MAR18 FIL MAT[0].DWG

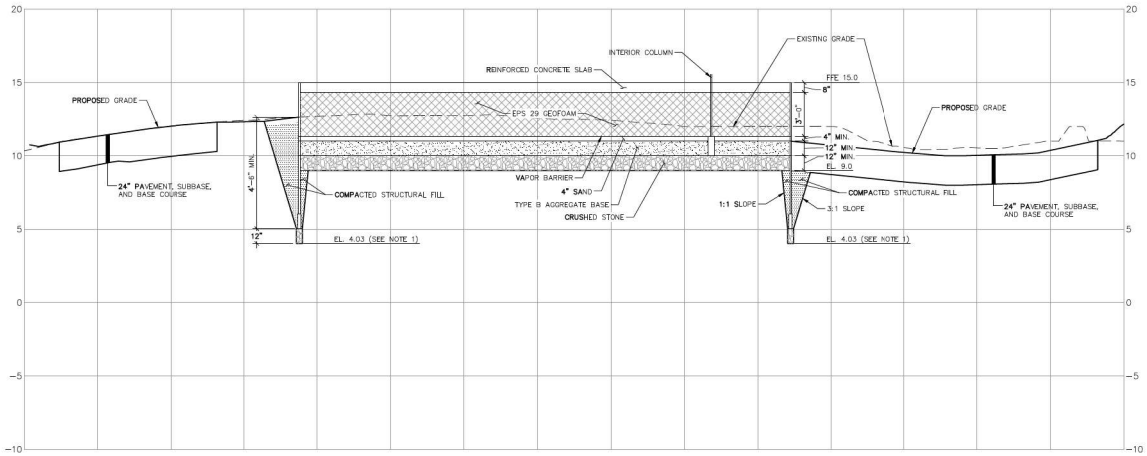
CUT FILL ANALYSIS PLAN
SUBBASE GRADE vs. EXISTING GROUND

MAINE PORT AUTHORITY

IMT WEST COLD STORAGE FACILITY

JOB NO.: 229064
DATE: FEBRUARY 2018
SCALE: 1"=40'
SHEET: OF

Figure 1



CUT/FILL SECTION

SCALE: HORIZ. 1" = 40, VERTICAL 1" = 4'

1
FIGURE 1

NOTE:

1. ELEVATION WAS SET BASED ON LOWEST POINT ALONG BUILDING FOUNDATION (EL. 9.53), SOUTHWEST CORNER.

40' 0 40' 80'

HORIZONTAL BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

4' 0 4' 8'

VERTICAL BAR SCALE
1" = 4'
CHECK GRAPHIC SCALE BEFORE USING

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MAINE PORT AUTHORITY

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REV.	DESCRIPTION	DATE
	DESIGNED BY: DAS / BDM	CHECKED BY: DAS
	DRAWN BY: BDM	23MAR18 FIL ANALYSIS.DWG

CUT FILL ANALYSIS SECTION

MAINE PORT AUTHORITY

IMT WEST COLD STORAGE FACILITY

JOB NO.: 229064
DATE: FEBRUARY 2018
SCALE: AS NOTED
SHEET: OF

Figure 2

C:\Users\jcoulombe\OneDrive — Woodard & Curran\...\PDFolders\Documents\...000 PROJECTS\229064.02 Maine Port Auth Cold Storage Site Prep\229064 Cut Fill Analysis.dwg Feb 22, 2018 - 11:05am

Option 2: Geopier GeoConcrete Columns (GCC)

Budget Estimate Summary

Maine Port Authority - Cold Storage Site Preparation (GCC Option #2)

Woodard & Curran
41 Hutchins Drive
Portland, Maine 04102

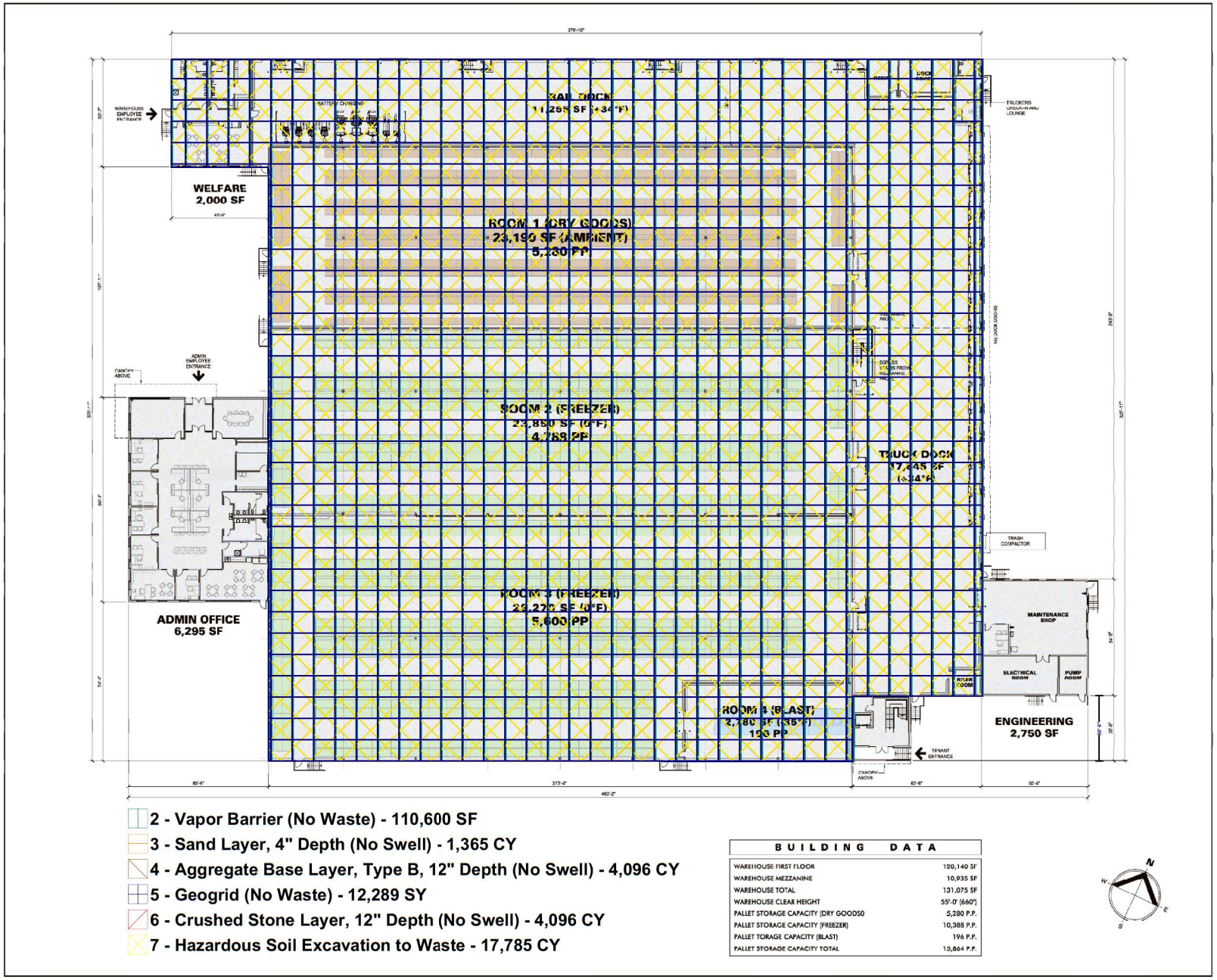
Date: 4/2/2018
Time: 11:05 AM
Project No.: 229064.02

		Labor	Material	Equipment	Subcontract	Temp Matl	Equip Rental	Other	Totals
Direct Construction Cost	%								
Base labor		$204,317	$302,302	$325,934	$4,246,317	$0	$0	$0	$5,078,869
Labor burden	35.00%	$71,511							$71,511
Labor fringes		$74,924							$74,924
Labor manhours		3,166							
Material sales tax	0.00%		$0						$0
Equipment shipping	3.50%			$11,408					$11,408
Temporary material markup	0.00%					$0			$0
Equipment rental markup	0.00%						$0		$0
Other markup	0.00%							$0	$0
Gross Construction Cost		$350,751	$302,302	$337,341	$4,246,317	$0	$0	$0	$5,236,711
General liability insurance	0.85%		$54,502						$54,502
Builder's risk insurance	0.15%		$9,618						$9,618
	Overall								
Contractor Overhead	0.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
	$0	$35,075	$36,642	$33,734	$424,632	$0	$0	$0	$530,083
Contractor Profit	0.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	
	$0	$28,060	$29,314	$26,987	$339,705	$0	$0	$0	$424,066
P&P Bond	$104,652		$104,652						$104,652
Site Safety	1.00%	$52,367							$52,367
Total Construction Cost		$466,254	$537,030	$398,063	$5,010,653	$0	$0	$0	$6,412,000
Civil & Site Engineering									$0
Geotechnical Engineering									$0
Permitting									$0
Construction Administration									$0
Sub-Total									**$6,412,000**
Project Contingency	15%								$962,000
Project Total									**$7,374,000**

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements			**116,626.46**	**12,459.08**	**402.00**	**8,953.99**			**138,442**
Quality requirements					**15,000.00**				**15,000**
Temporary facilities and controls			**742.50**	**10,529.75**	**267.00**	**4,190.97**			**15,730**
Execution requirements				**972.00**	**2,947.50**				**3,920**
*** Total General Conditions**	**1.00**	**LS**	**117,368.96**	**23,960.83**	**18,616.50**	**13,144.97**		**173,091.26**	**173,091**
Sitework									
Site preparation			**21,707.16**	**3,775.06**		**41,535.52**			**67,018**
Earthwork			**211,675.35**	**274,565.61**	**1,094,700.00**	**282,660.98**			**1,863,602**
Foundations					**3,133,000.00**				**3,133,000**
*** Total Sitework**	**1.00**	**LS**	**233,382.51**	**278,340.67**	**4,227,700.00**	**324,196.50**		**5,063,619.68**	**5,063,620**
Total Gross Cost			**350,751.47**	**302,301.50**	**4,246,316.50**	**337,341.47**			**5,236,711**

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements									
Mobilize/Demobilize	1.00	LS	5,062.46	896.00		8,953.99		14,912.45	14,912
Project Manager	6.00	WEEK	22,680.00					3,780.00	22,680
Project Superintendent	14.00	WEEK	49,140.00					3,510.00	49,140
Field Engineer	12.00	WEEK	29,808.00					2,484.00	29,808
Safety Engineer	4.00	WEEK	9,936.00					2,484.00	9,936
Permit (Allowance)	1.00	LS		9,345.79				9,345.79	9,346
Purchase drawings	1.00	LS		467.29				467.29	467
Travel expenses	14.00	WEEK		1,750.00				125.00	1,750
Progress photographs	3.00	MO			402.00			134.00	402
**** Total Administrative requirements**			**116,626.46**	**12,459.08**	**402.00**	**8,953.99**			**138,442**
Quality requirements									
Testing (Allowance)	1.00	LS			15,000.00			15,000.00	15,000
**** Total Quality requirements**					**15,000.00**				**15,000**
Temporary facilities and controls									
Job telephone	3.00	MO		1,050.00				350.00	1,050
Electrical energy costs	3.00	MO		1,350.00				450.00	1,350
Water usage costs	3.00	MO		300.00	267.00			189.00	567
Office trailer	3.00	MO		1,350.00				450.00	1,350
Storage trailer(s)	3.00	MO		375.00				125.00	375
Temporary toilets	3.00	MO		1,020.00				340.00	1,020
Water, ice and cups	3.00	MO		427.50				142.50	428
First aid supplies	3.00	MO		150.00				50.00	150
Safety supplies	3.00	MO		456.75				152.25	457
Office supplies	3.00	MO		250.50				83.50	251
Small tools	3.00	MO				520.86		173.62	521
Gasoline and lubricating oil	800.00	GALS		2,800.00				3.50	2,800
Automobile	1.50	MO				931.50		621.00	932
Pick-up truck	3.00	MO				2,738.61		912.87	2,739
Job sign	2.00	EACH	742.50	1,000.00				871.25	1,743
**** Total Temporary facilities and controls**			**742.50**	**10,529.75**	**267.00**	**4,190.97**			**15,730**
Execution requirements									
Layout supplies	12.00	WEEK		972.00				81.00	972
Rubbish removal	180.00	CUYD			2,947.50			16.38	2,948
**** Total Execution requirements**				**972.00**	**2,947.50**				**3,920**
*** Total General Conditions**	**1.00**	**LS**	**117,368.96**	**23,960.83**	**18,616.50**	**13,144.97**		**173,091.26**	**173,091**
Sitework									
Site preparation									
Erosion control	1,500.00	LNFT	2,768.50	1,045.80				2.54	3,814
Rough grading	2.54	ACRE	4,673.26	2,089.26		4,619.08		4,482.66	11,382
Dewatering pumps	2.00	EACH	5,272.87			33,000.00		19,136.43	38,273
Dewatering sumps	100.00	LNFT	8,992.53	640.00		3,916.44		135.49	13,549
**** Total Site preparation**			**21,707.16**	**3,775.06**		**41,535.52**			**67,018**
Earthwork									
Site cut to waste (Assumed Qty)	17,800.00	CUYD	42,289.42	18,907.16		63,441.44		7.00	124,638

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
Haul excavated material 8-10 miles (Assumed QTY)	26,700.00	TONS	50,740.01	8,979.21		89,743.04		5.60	149,462
Contaminated soil disposal	26,700.00	TONS			1,094,700.00			41.00	1,094,700
Compact subgrade	110,600.00	SQFT	28,493.33	12,741.12		28,171.31		0.63	69,406
Vapor barrier	121,660.00	SQFT	21,286.24	3,090.16				0.20	24,376
Sand fill layer, 4" depth	1,844.00	CUYD	7,376.36	12,357.93		13,453.49		18.00	33,188
Type B aggregate base layer, 12" depth	5,530.00	CUYD	25,286.84	72,387.15		46,119.79		26.00	143,794
Geogrid soil stabilization	12,290.00	SQYD	13,900.67	45,254.24		1,055.77		4.90	60,211
Crushed stone layer, 12" depth	5,120.00	CUYD	22,302.49	100,848.64		40,676.13		32.00	163,827
**** Total Earthwork**			**211,675.35**	**274,565.61**	**1,094,700.00**	**282,660.98**			**1,863,602**
Foundations									
Geopier GCC Rigid Inclusions, 16" dia at 7' oc	2,000.00	EACH			3,133,000.00			1,566.50	3,133,000
Geofoam, EPS 29 (DELETED)		CUYD						102.26	
**** Total Foundations**					**3,133,000.00**				**3,133,000**
*** Total Sitework**	**1.00**	**LS**	**233,382.51**	**278,340.67**	**4,227,700.00**	**324,196.50**		**5,063,619.68**	**5,063,620**
Total Gross Cost			**350,751.47**	**302,301.50**	**4,246,316.50**	**337,341.47**			**5,236,711**



2 - Vapor Barrier (No Waste) - 110,600 SF
3 - Sand Layer, 4" Depth (No Swell) - 1,365 CY
4 - Aggregate Base Layer, Type B, 12" Depth (No Swell) - 4,096 CY
5 - Geogrid (No Waste) - 12,289 SY
6 - Crushed Stone Layer, 12" Depth (No Swell) - 4,096 CY
7 - Hazardous Soil Excavation to Waste - 17,785 CY

BUILDING DATA	
WAREHOUSE FIRST FLOOR	120,140 SF
WAREHOUSE MEZZANINE	10,935 SF
WAREHOUSE TOTAL	131,075 SF
WAREHOUSE CLEAR HEIGHT	55'-0" (660")
PALLET STORAGE CAPACITY (DRY GOODS)	5,280 P.P.
PALLET STORAGE CAPACITY (FREEZER)	10,388 P.P.
PALLET TORAGE CAPACITY (BLAST)	196 P.P.
PALLET STORAGE CAPACITY TOTAL	15,864 P.P.

SUBMITTALS / REVISIONS

No.	DESCRIPTION	DATE	BY
1	ISSUE FOR REVIEW / PRICING	02/10/16	DGRAY
2	RFP SUBMITTAL DRAWINGS	09/01/16	DGRAY

PRELIMINARY DRAWING: ■
RFP DRAWING: □
CONSTRUCTION DRAWING: □
AS-BUILT DRAWING: □

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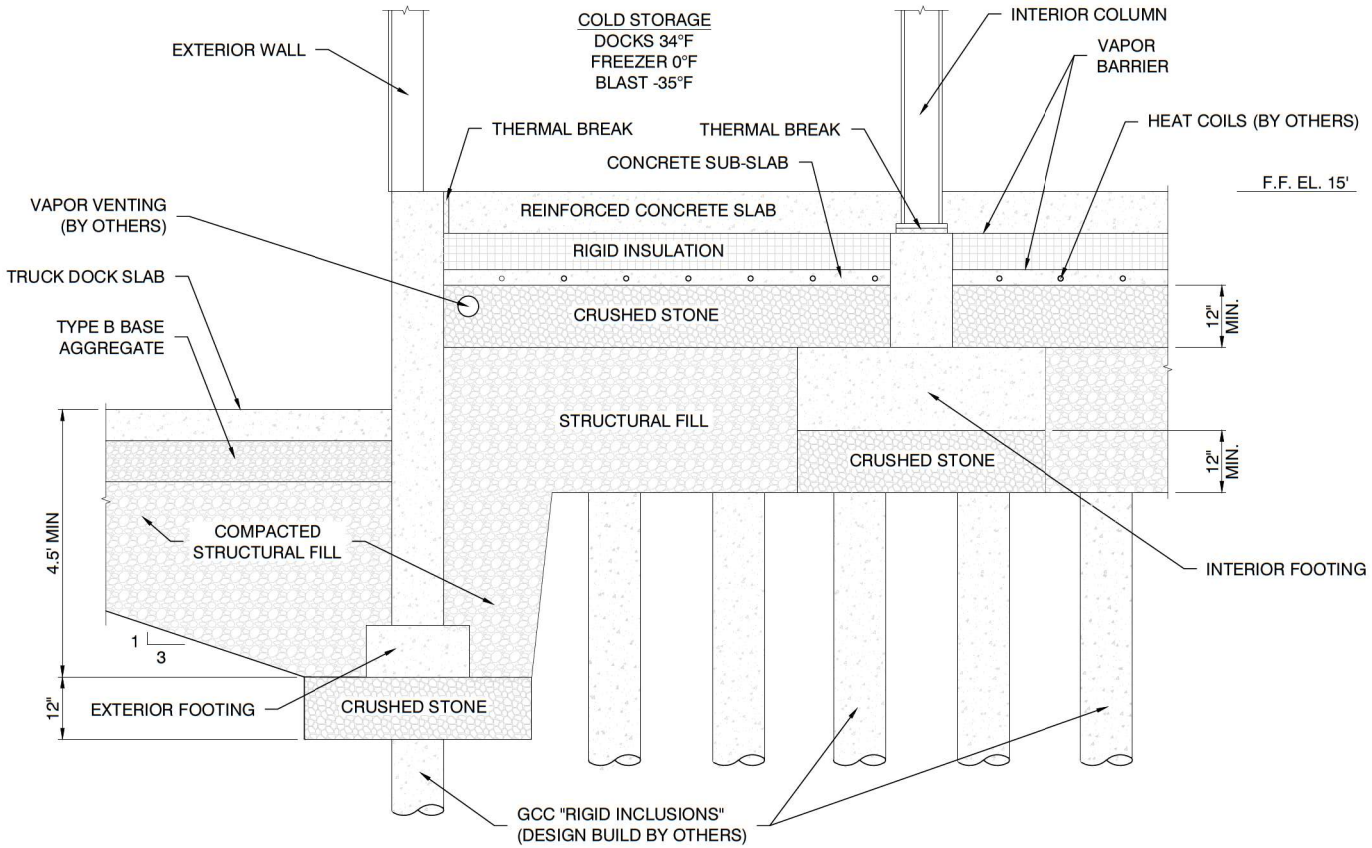
PROJECT
MAINE PORT AUTHORITY
PROPOSAL FOR
IMT WEST
COLD STORAGE FACILITY
460 COMMERCIAL STREET
PORTLAND, ME 04101

DRAWING
BUILDING FLOOR PLAN
PROPOSED WAREHOUSE

PROJECT No:	1533	DRAWN:	DGRAY
DATE:	09/08/2016	CHECKED:	KHH
SCALE:	AS NOTED		

DRAWING No:
A201



S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	3

Option 3a: Pipe Piles

Budget Estimate Summary

Maine Port Authority - Cold Storage Site Preparation (Pipe Pile Option #3a)

Woodard & Curran
41 Hutchins Drive
Portland, Maine 04102

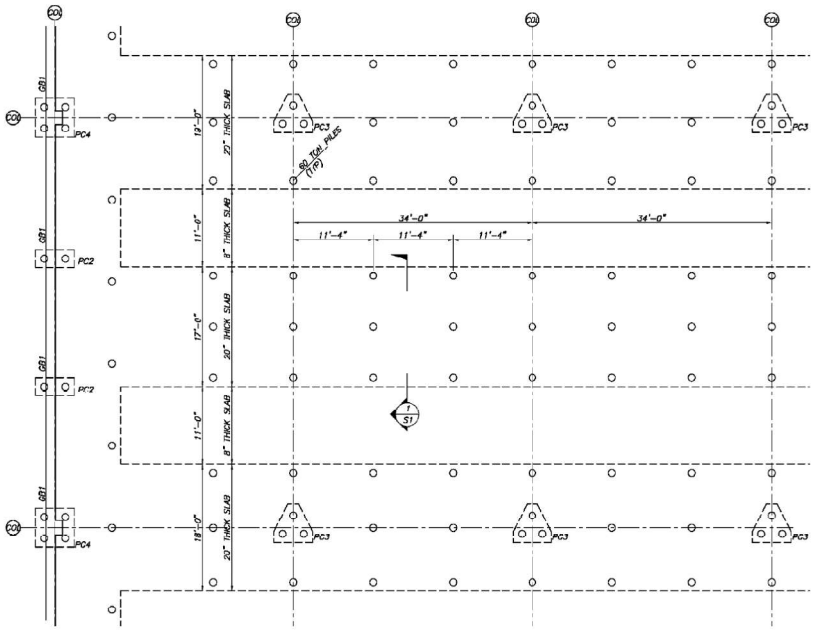
Date: 4/2/2018
Time: 11:23 AM
Project No.: 229064.02

		Labor	Material	Equipment	Subcontract	Temp Matl	Equip Rental	Other	Totals
Direct Construction Cost	%								
Base labor		$451,632	$707,635	$188,557	$3,440,066	$0	$0	$0	$4,787,891
Labor burden	35.00%	$158,071							$158,071
Labor fringes		$271,813							$271,813
Labor manhours		10,072							
Material sales tax	0.00%		$0						$0
Equipment shipping	3.50%			$6,600					$6,600
Temporary material markup	0.00%					$0			$0
Equipment rental markup	0.00%						$0		$0
Other markup	0.00%							$0	$0
Gross Construction Cost		$881,517	$707,635	$195,157	$3,440,066	$0	$0	$0	$5,224,375
General liability insurance	0.85%		$54,374						$54,374
Builder's risk insurance	0.15%		$9,595						$9,595
	Overall								
Contractor Overhead	0.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
	$0	$88,152	$77,160	$19,516	$344,007	$0	$0	$0	$528,835
Contractor Profit	0.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	
	$0	$70,521	$61,728	$15,613	$275,205	$0	$0	$0	$423,068
P&P Bond	$104,509		$104,509						$104,509
Site Safety	1.00%	$52,244							$52,244
Total Construction Cost		$1,092,434	$1,015,002	$230,285	$4,059,278	$0	$0	$0	$6,397,000
Civil & Site Engineering									$0
Geotechnical Engineering									$0
Permitting									$0
Construction Administration									$0
Sub-Total									**$6,397,000**
Project Contingency	15%								$960,000
Project Total									**$7,357,000**

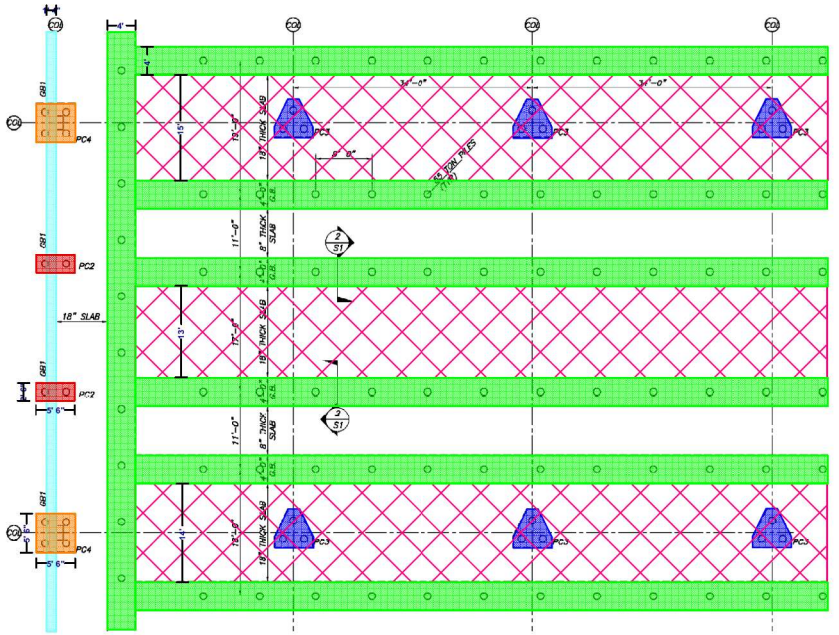
Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements			116,626.46	12,459.08	402.00	8,953.99			138,442
Quality requirements					15,000.00				15,000
Temporary facilities and controls			742.50	10,529.75	267.00	4,190.97			15,730
Execution requirements				972.00	2,947.50				3,920
* Total General Conditions	1.00	LS	117,368.96	23,960.83	18,616.50	13,144.97		173,091.26	173,091
Sitework									
Site preparation			21,707.16	3,775.06		41,535.52			67,018
Earthwork			84,102.71	120,283.22	141,450.00	88,640.94			434,477
Foundations					3,280,000.00				3,280,000
* Total Sitework	1.00	LS	105,809.87	124,058.28	3,421,450.00	130,176.47		3,781,494.61	3,781,495
Concrete									
Formwork			188,228.26	15,532.53					203,761
Concrete reinforcing			338,129.45	244,004.45					582,134
Cast in place concrete			131,980.30	300,078.88		51,835.51			483,895
* Total Concrete	1.00	LS	658,338.00	559,615.85		51,835.51		1,269,789.36	1,269,789
Total Gross Cost			881,516.84	707,634.96	3,440,066.50	195,156.94			5,224,375

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements									
Mobilize/Demobilize	1.00	LS	5,062.46	896.00		8,953.99		14,912.45	14,912
Project Manager	6.00	WEEK	22,680.00					3,780.00	22,680
Project Superintendent	14.00	WEEK	49,140.00					3,510.00	49,140
Field Engineer	12.00	WEEK	29,808.00					2,484.00	29,808
Safety Engineer	4.00	WEEK	9,936.00					2,484.00	9,936
Permit (Allowance)	1.00	LS		9,345.79				9,345.79	9,346
Purchase drawings	1.00	LS		467.29				467.29	467
Travel expenses	14.00	WEEK		1,750.00				125.00	1,750
Progress photographs	3.00	MO			402.00			134.00	402
**** Total Administrative requirements**			**116,626.46**	**12,459.08**	**402.00**	**8,953.99**			**138,442**
Quality requirements									
Testing (Allowance)	1.00	LS			15,000.00			15,000.00	15,000
**** Total Quality requirements**					**15,000.00**				**15,000**
Temporary facilities and controls									
Job telephone	3.00	MO		1,050.00				350.00	1,050
Electrical energy costs	3.00	MO		1,350.00				450.00	1,350
Water usage costs	3.00	MO		300.00	267.00			189.00	567
Office trailer	3.00	MO		1,350.00				450.00	1,350
Storage trailer(s)	3.00	MO		375.00				125.00	375
Temporary toilets	3.00	MO		1,020.00				340.00	1,020
Water, ice and cups	3.00	MO		427.50				142.50	428
First aid supplies	3.00	MO		150.00				50.00	150
Safety supplies	3.00	MO		456.75				152.25	457
Office supplies	3.00	MO		250.50				83.50	251
Small tools	3.00	MO				520.86		173.62	521
Gasoline and lubricating oil	800.00	GALS		2,800.00				3.50	2,800
Automobile	1.50	MO				931.50		621.00	932
Pick-up truck	3.00	MO				2,738.61		912.87	2,739
Job sign	2.00	EACH	742.50	1,000.00				871.25	1,743
**** Total Temporary facilities and controls**			**742.50**	**10,529.75**	**267.00**	**4,190.97**			**15,730**
Execution requirements									
Layout supplies	12.00	WEEK		972.00				81.00	972
Rubbish removal	180.00	CUYD			2,947.50			16.38	2,948
**** Total Execution requirements**				**972.00**	**2,947.50**				**3,920**
*** Total General Conditions**	**1.00**	**LS**	**117,368.96**	**23,960.83**	**18,616.50**	**13,144.97**		**173,091.26**	**173,091**
Sitework									
Site preparation									
Erosion control	1,500.00	LNFT	2,768.50	1,045.80				2.54	3,814
Rough grading	2.54	ACRE	4,673.26	2,089.26		4,619.08		4,482.66	11,382
Dewatering pumps	2.00	EACH	5,272.87			33,000.00		19,136.43	38,273
Dewatering sumps	100.00	LNFT	8,992.53	640.00		3,916.44		135.49	13,549
**** Total Site preparation**			**21,707.16**	**3,775.06**		**41,535.52**			**67,018**
Earthwork									
Site cut to waste (Assumed Qty)	2,300.00	CUYD	5,464.36	2,443.06		8,197.49		7.00	16,105

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
Haul excavated material 8-10 miles (Assumed QTY)	3,450.00	TONS	6,556.29	1,160.24		11,596.01		5.60	19,313
Contaminated soil disposal	3,450.00	TONS			141,450.00			41.00	141,450
Compact subgrade	110,600.00	SQFT	28,493.33	12,741.12		28,171.31		0.63	69,406
Vapor barrier	121,660.00	SQFT	21,286.24	3,090.16				0.20	24,376
Sand fill layer, 4" depth (DELETED)		CUYD						18.00	
Type B aggregate base layer, 12" depth (DELETED)		CUYD						26.00	
Geogrid soil stabilization (DELETED)		SQYD						4.90	
Crushed stone layer, 12" depth	5,120.00	CUYD	22,302.49	100,848.64		40,676.13		32.00	163,827
**** Total Earthwork**			**84,102.71**	**120,283.22**	**141,450.00**	**88,640.94**			**434,477**
Foundations									
Pipe Piles, 14" dia concrete filled, 70' ave. depth	840.00	EACH			3,280,000.00			3,904.76	3,280,000
Geofoam, EPS 29 (DELETED)		CUYD						102.26	
**** Total Foundations**					**3,280,000.00**				**3,280,000**
*** Total Sitework**	**1.00**	**LS**	**105,809.87**	**124,058.28**	**3,421,450.00**	**130,176.47**		**3,781,494.61**	**3,781,495**
Concrete									
Formwork									
Pile cap edge forms	3,957.00	SQFT	49,982.07	1,708.24				13.06	51,690
Grade beam form 0' to 2' deep	19,800.00	SQFT	124,039.97	12,264.12				6.88	136,304
Grade beam form hardware	9,900.00	SQFT		1,013.76				0.10	1,014
Form releasing agent	23,757.00	SQFT	14,206.21	546.41				0.62	14,753
**** Total Formwork**			**188,228.26**	**15,532.53**					**203,761**
Concrete reinforcing									
SOG rebar	67.82	TONS	114,128.46	81,378.36				2,882.93	195,507
Pile cap rebar	14.11	TONS	23,326.01	16,934.83				2,852.88	40,261
Grade beam rebar	121.41	TONS	200,674.97	145,691.26				2,852.88	346,366
**** Total Concrete reinforcing**			**338,129.45**	**244,004.45**					**582,134**
Cast in place concrete									
** Concrete in pile caps and pier caps **		****							
4000 psi direct	177.90	CUYD	5,129.98	18,323.91		105.87		132.43	23,560
Concrete in grade beams		****							
4000 psi direct	1,299.38	CUYD	42,821.42	133,835.63		883.70		136.64	177,541
Concrete in slab on grade		****							
4000 psi w/pump	1,393.52	CUYD	51,962.06	144,748.53		29,986.54		162.68	226,697
* No. of pile caps *	139.00	EACH							
* Grade beam length *	6,600.00	LNFT							
* SOG area *	43,000.00	SQFT							
Finish footing concrete top surface	25,324.75	SQFT	4,442.72	154.48		2,888.47		0.30	7,486
Point and patch	19,800.00	SQFT	4,838.43	421.74		3,147.72		0.42	8,408
Protect and cure vertical surfaces	23,757.00	SQFT	6,089.51	783.98		3,961.21		0.46	10,835
Protect and cure horizontal surfaces	68,324.75	SQFT	16,696.18	1,810.61		10,862.00		0.43	29,369
**** Total Cast in place concrete**			**131,980.30**	**300,078.88**		**51,835.51**			**483,895**
*** Total Concrete**	**1.00**	**LS**	**658,338.00**	**559,615.85**		**51,835.51**		**1,269,789.36**	**1,269,789**
Total Gross Cost			**881,516.84**	**707,634.96**	**3,440,066.50**	**195,156.94**			**5,224,375**



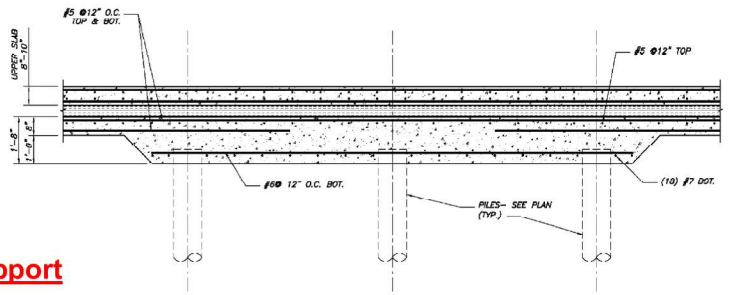
PARTIAL PLAN – OPTION 1
1/8"=1'-0"



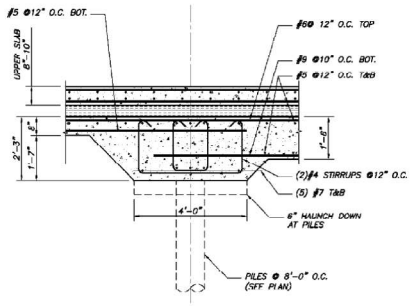
PARTIAL PLAN – OPTION 2
1/8"=1'-0"

CONCRETE NOTES

1. CONCRETE WORK SHALL CONFORM TO THE ACI "MANUAL OF CONCRETE PRACTICE," INCLUDING BUT NOT LIMITED TO ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE."
2. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ADDITIONAL CONCRETE MIX PERFORMANCE DATA INCLUDING AIR CONTENT, WATER-CEMENT RATIO, AGGREGATE SIZE, SLUMP, ETC. HAS BEEN INCLUDED IN THE PROJECT SPECIFICATIONS. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 DEFORMED BARS AND SHALL BE DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH ACI 315.
4. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE LAPPED BARS AT NECESSARY SPLICES OR HOOKED BARS AT DISCONTINUOUS ENDS. SEE SCHEDULE FOR REQUIRED REBAR LAP SPLICE LENGTHS.
5. SLAB THICKNESSES INDICATED ON THE DRAWINGS ARE MINIMUMS. PROVIDE SUFFICIENT CONCRETE TO ACCOUNT FOR STRUCTURAL DEFLECTION, SUBGRADE FLUCTUATIONS, AND TO OBTAIN THE TO ACCOUNT ELEVATION AT THE FLATNESS AND LEVELNESS INDICATED.



SECTION
1/2"=1'-0"



SECTION
1/2"=1'-0"

Option 2 Concrete Support

- 8 - Pile Cap (PC2) - 46 Total QTY
- 9 - Pile Cap (PC3) - 48 Total QTY
- 10 - Pile Cap (PC4) - 45 Total QTY
- 11 - Grade Beam, 1'-7" depth - 5,100 Total LF
- 12 - Thickened Slab, 10" depth - 43,000 Total SF
- 13 - Grade Beam (GB1) - 1,500 Total LF

NOT FOR CONSTRUCTION
PRELIMINARY 3/9/18

THESE DWGS ARE NOT COMPLETE. DESIGN IS STILL IN PROGRESS. CONTRACTOR SHALL CARRY APPROPRIATE CONTINGENCY.

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BECKER STRUCTURAL ENGINEERS
75 York Street, Portland, Maine 04101
(207) 874-1401 · info@beckerstructural.com

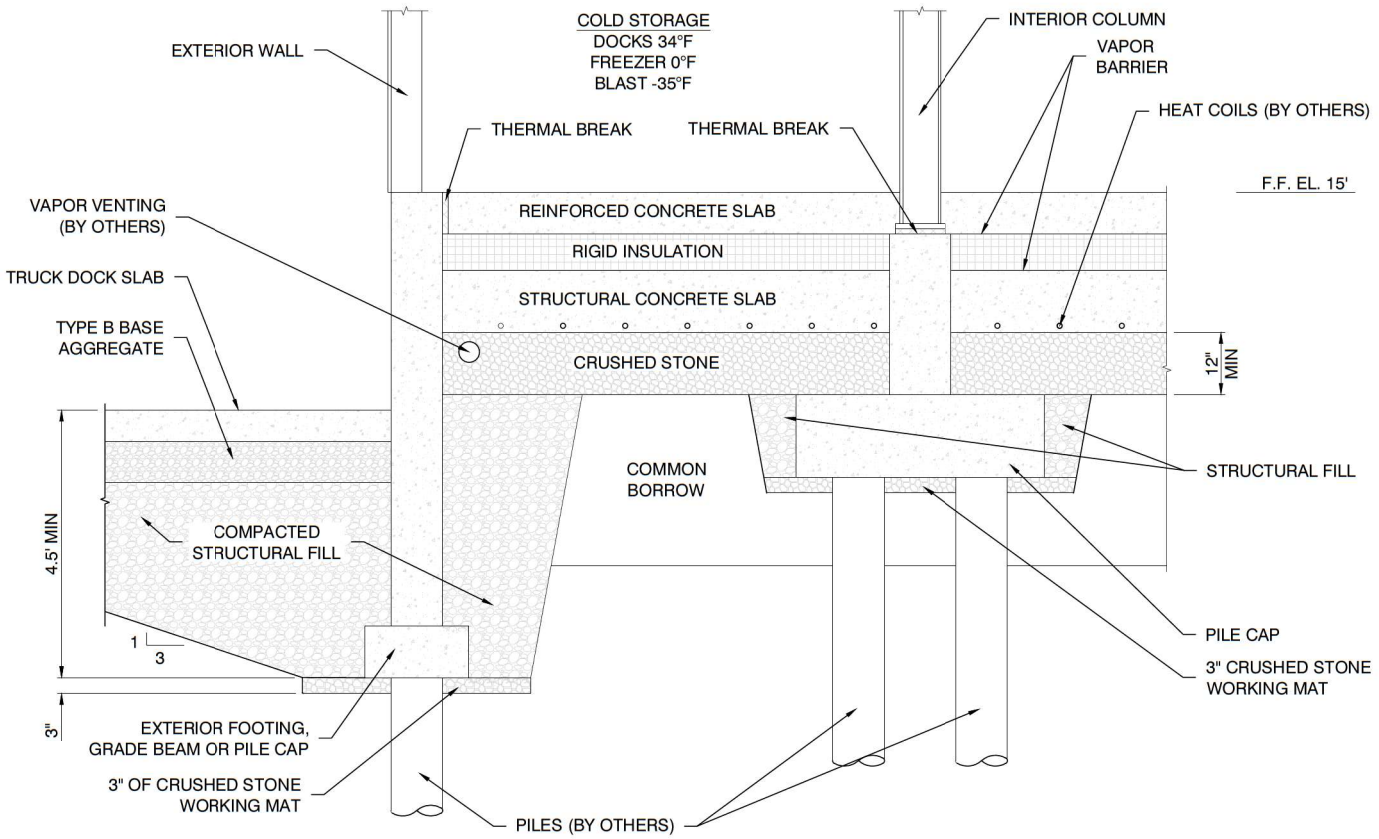
Rev No.	Date	Issued For	Appvd

ME PORT AUTHORITY
COLD STORAGE BUILDING

PRELIMINARY UNDERSLAB PLAN

Designed	Scale
EAR	NOTED
Drawn	Date
EAR	3/9/18
Checked	Becker Job Number
DPM	4270

S1



S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	4

Option 3b: H-Piles

Budget Estimate Summary

Maine Port Authority - Cold Storage Site Preparation (H-Pile Option #3b)

Woodard & Curran
41 Hutchins Drive
Portland, Maine 04102

Date: 4/2/2018
Time: 11:28 AM
Project No.: 229064.02

		Labor	Material	Equipment	Subcontract	Temp Matl	Equip Rental	Other	Totals
Direct Construction Cost	%								
Base labor		$451,632	$708,235	$188,557	$3,204,450	$0	$0	$0	$4,552,875
Labor burden	35.00%	$158,071							$158,071
Labor fringes		$271,813							$271,813
Labor manhours		10,072							
Material sales tax	0.00%		$0						$0
Equipment shipping	3.50%			$6,600					$6,600
Temporary material markup	0.00%					$0			$0
Equipment rental markup	0.00%						$0		$0
Other markup	0.00%							$0	$0
Gross Construction Cost		$881,517	$708,235	$195,157	$3,204,450	$0	$0	$0	$4,989,359
General liability insurance	0.85%		$46,877						$46,877
Builder's risk insurance	0.15%		$8,272						$8,272
	Overall								
Contractor Overhead	0.00%	10.00%	10.00%	10.00%	0.00%	10.00%	10.00%	10.00%	
	$0	$88,152	$76,338	$19,516	$0	$0	$0	$0	$184,006
Contractor Profit	0.00%	8.00%	8.00%	8.00%	0.00%	8.00%	8.00%	8.00%	
	$0	$70,521	$61,071	$15,613	$0	$0	$0	$0	$147,205
P&P Bond	$89,387		$89,387						$89,387
Site Safety	1.00%	$49,894							$49,894
Total Construction Cost		$1,090,083	$990,181	$230,285	$3,204,450	$0	$0	$0	$5,515,000
Civil & Site Engineering									$0
Geotechnical Engineering									$0
Permitting									$0
Construction Administration									$0
Sub-Total									**$5,515,000**
Project Contingency	15%								$827,000
Project Total									**$6,342,000**

Recap - With Taxes and Insurance

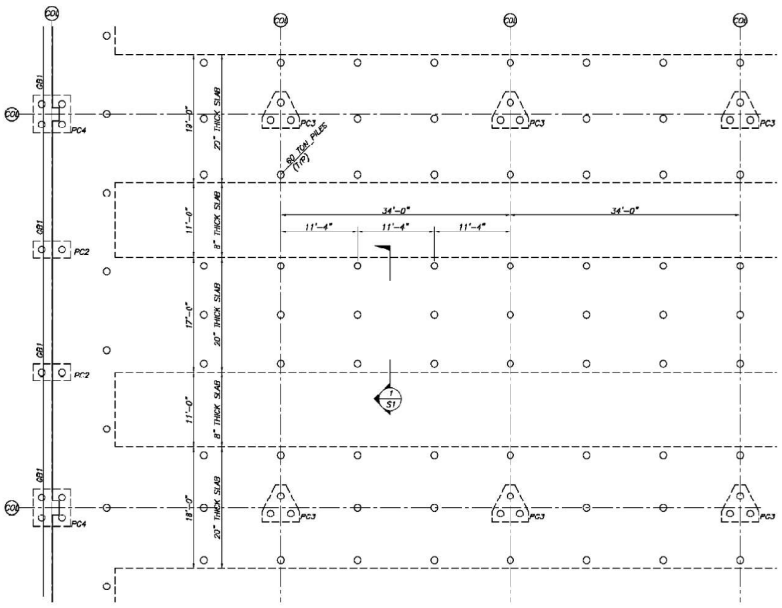
Group 1: Divisions
Group 2: Major ItemCode Groups

Estimator : John Brockington
Project Size : 0 SQFT

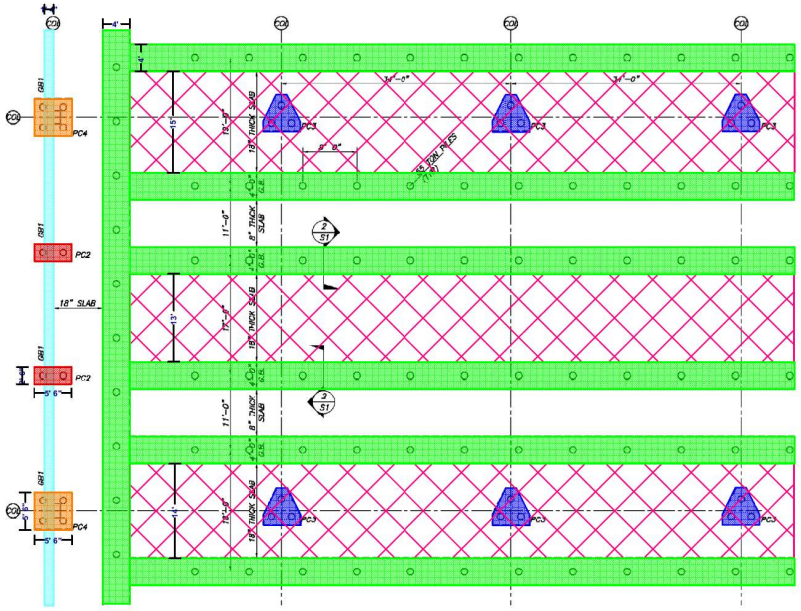
Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements			116,626.46	12,859.08		8,953.99			138,440
Quality requirements					15,000.00				15,000
Temporary facilities and controls			742.50	10,729.75		4,190.97			15,663
Execution requirements				972.00	3,000.01				3,972
* Total General Conditions	1.00	LS	117,368.96	24,560.83	18,000.01	13,144.97		173,074.77	173,075
Sitework									
Site preparation			21,707.16	3,775.06		41,535.52			67,018
Earthwork			84,102.71	120,283.22	141,450.00	88,640.94			434,477
Foundations					3,045,000.00				3,045,000
* Total Sitework	1.00	LS	105,809.87	124,058.28	3,186,450.00	130,176.47		3,546,494.62	3,546,495
Concrete									
Formwork			188,228.26	15,532.53					203,761
Concrete reinforcing			338,129.45	244,004.45					582,134
Cast in place concrete			131,980.30	300,078.88		51,835.51			483,895
* Total Concrete	1.00	LS	658,338.00	559,615.85		51,835.51		1,269,789.36	1,269,789
Total Gross Cost			881,516.84	708,234.96	3,204,450.01	195,156.94			4,989,359

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
General Conditions									
Administrative requirements									
Mobilize/Demobilize	1.00	LS	5,062.46	896.00		8,953.99		14,912.45	14,912
Project Manager	6.00	WEEK	22,680.00					3,780.00	22,680
Project Superintendent	14.00	WEEK	49,140.00					3,510.00	49,140
Field Engineer	12.00	WEEK	29,808.00					2,484.00	29,808
Safety Engineer	4.00	WEEK	9,936.00					2,484.00	9,936
Permit (Allowance)	1.00	LS		9,345.79				9,345.79	9,346
Purchase drawings	1.00	LS		467.29				467.29	467
Travel expenses	14.00	WEEK		1,750.00				125.00	1,750
Progress photographs	3.00	MO		400.00				133.33	400
**** Total Administrative requirements**			**116,626.46**	**12,859.08**		**8,953.99**			**138,440**
Quality requirements									
Testing (Allowance)	1.00	LS			15,000.00			15,000.00	15,000
**** Total Quality requirements**					**15,000.00**				**15,000**
Temporary facilities and controls									
Job telephone	3.00	MO		1,050.00				350.00	1,050
Electrical energy costs	3.00	MO		1,350.00				450.00	1,350
Water usage costs	3.00	MO		500.00				166.67	500
Office trailer	3.00	MO		1,350.00				450.00	1,350
Storage trailer(s)	3.00	MO		375.00				125.00	375
Temporary toilets	3.00	MO		1,020.00				340.00	1,020
Water, ice and cups	3.00	MO		427.50				142.50	428
First aid supplies	3.00	MO		150.00				50.00	150
Safety supplies	3.00	MO		456.75				152.25	457
Office supplies	3.00	MO		250.50				83.50	251
Small tools	3.00	MO				520.86		173.62	521
Gasoline and lubricating oil	800.00	GALS		2,800.00				3.50	2,800
Automobile	1.50	MO				931.50		621.00	932
Pick-up truck	3.00	MO				2,738.61		912.87	2,739
Job sign	2.00	EACH	742.50	1,000.00				871.25	1,743
**** Total Temporary facilities and controls**			**742.50**	**10,729.75**		**4,190.97**			**15,663**
Execution requirements									
Layout supplies	12.00	WEEK		972.00				81.00	972
Rubbish removal	180.00	CUYD			3,000.01			16.67	3,000
**** Total Execution requirements**				**972.00**	**3,000.01**				**3,972**
*** Total General Conditions**	**1.00**	**LS**	**117,368.96**	**24,560.83**	**18,000.01**	**13,144.97**		**173,074.77**	**173,075**
Sitework									
Site preparation									
Erosion control	1,500.00	LNFT	2,768.50	1,045.80				2.54	3,814
Rough grading	2.54	ACRE	4,673.26	2,089.26		4,619.08		4,482.66	11,382
Dewatering pumps	2.00	EACH	5,272.87			33,000.00		19,136.43	38,273
Dewatering sumps	100.00	LNFT	8,992.53	640.00		3,916.44		135.49	13,549
**** Total Site preparation**			**21,707.16**	**3,775.06**		**41,535.52**			**67,018**
Earthwork									
Site cut to waste (Assumed Qty)	2,300.00	CUYD	5,464.36	2,443.06		8,197.49		7.00	16,105

Description	Quantity	UM	Labor	Material	Subcontract	Cons. Eqp.	Proc. Eqp.	Unit Cost	Total Cost
Haul excavated material 8-10 miles (Assumed QTY)	3,450.00	TONS	6,556.29	1,160.24		11,596.01		5.60	19,313
Contaminated soil disposal (Assume 1.5T/CY)	3,450.00	TONS			141,450.00			41.00	141,450
Compact subgrade	110,600.00	SQFT	28,493.33	12,741.12		28,171.31		0.63	69,406
Vapor barrier	121,660.00	SQFT	21,286.24	3,090.16				0.20	24,376
Sand fill layer, 4" depth (DELETED)		CUYD						18.00	
Type B aggregate base layer, 12" depth (DELETED)		CUYD						26.00	
Geogrid soil stabilization (DELETED)		SQYD						4.90	
Crushed stone layer, 12" depth	5,120.00	CUYD	22,302.49	100,848.64		40,676.13		32.00	163,827
**** Total Earthwork**			**84,102.71**	**120,283.22**	**141,450.00**	**88,640.94**			**434,477**
Foundations									
H-Piles, HP10x42, 60-Ton capacity, 110' ave. depth	840.00	EACH			3,045,000.00			3,625.00	3,045,000
Geofoam, EPS 29 (DELETED)		CUYD						102.26	
**** Total Foundations**					**3,045,000.00**				**3,045,000**
***** Total Sitework**	**1.00**	**LS**	**105,809.87**	**124,058.28**	**3,186,450.00**	**130,176.47**		**3,546,494.62**	**3,546,495**
Concrete									
Formwork									
Pile cap edge forms	3,957.00	SQFT	49,982.07	1,708.24				13.06	51,690
Grade beam form 0' to 2' deep	19,800.00	SQFT	124,039.97	12,264.12				6.88	136,304
Grade beam form hardware	9,900.00	SQFT		1,013.76				0.10	1,014
Form releasing agent	23,757.00	SQFT	14,206.21	546.41				0.62	14,753
**** Total Formwork**			**188,228.26**	**15,532.53**					**203,761**
Concrete reinforcing									
SOG rebar	67.82	TONS	114,128.46	81,378.36				2,882.93	195,507
Pile cap rebar	14.11	TONS	23,326.01	16,934.83				2,852.88	40,261
Grade beam rebar	121.41	TONS	200,674.97	145,691.26				2,852.88	346,366
**** Total Concrete reinforcing**			**338,129.45**	**244,004.45**					**582,134**
Cast in place concrete									
** Concrete in pile caps and pier caps **		****							
4000 psi direct	177.90	CUYD	5,129.98	18,323.91		105.87		132.43	23,560
Concrete in grade beams		****							
4000 psi direct	1,299.38	CUYD	42,821.42	133,835.63		883.70		136.64	177,541
Concrete in slab on grade		****							
4000 psi w/pump	1,393.52	CUYD	51,962.06	144,748.53		29,986.54		162.68	226,697
* No. of pile caps *	139.00	EACH							
* Grade beam length *	6,600.00	LNFT							
* SOG area *	43,000.00	SQFT							
Finish footing concrete top surface	25,324.75	SQFT	4,442.72	154.48		2,888.47		0.30	7,486
Point and patch	19,800.00	SQFT	4,838.43	421.74		3,147.72		0.42	8,408
Protect and cure vertical surfaces	23,757.00	SQFT	6,089.51	783.98		3,961.21		0.46	10,835
Protect and cure horizontal surfaces	68,324.75	SQFT	16,696.18	1,810.61		10,862.00		0.43	29,369
**** Total Cast in place concrete**			**131,980.30**	**300,078.88**		**51,835.51**			**483,895**
***** Total Concrete**	**1.00**	**LS**	**658,338.00**	**559,615.85**		**51,835.51**		**1,269,789.36**	**1,269,789**
Total Gross Cost			**881,516.84**	**708,234.96**	**3,204,450.01**	**195,156.94**			**4,989,359**



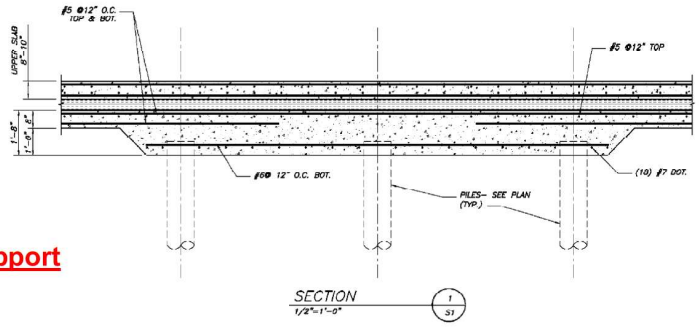
PARTIAL PLAN – OPTION 1
1/8"=1'-0"



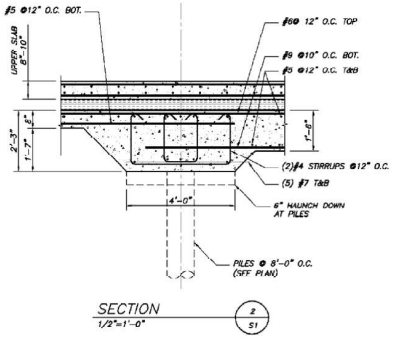
PARTIAL PLAN – OPTION 2
1/8"=1'-0"

CONCRETE NOTES

1. CONCRETE WORK SHALL CONFORM TO THE ACI "MANUAL OF CONCRETE PRACTICE," INCLUDING BUT NOT LIMITED TO ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE."
2. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ADDITIONAL CONCRETE MIX PERFORMANCE DATA INCLUDING AIR CONTENT, WATER-CEMENT RATIO, AGGREGATE SIZE, SLUMP, ETC. HAS BEEN INCLUDED IN THE PROJECT SPECIFICATIONS. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 DEFORMED BARS AND SHALL BE DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH ACI 315.
4. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE LAPPED BARS AT NECESSARY SPLICES OR HOOKED BARS AT DISCONTINUOUS ENDS. SEE SCHEDULE FOR REQUIRED REBAR LAP SPLICE LENGTHS.
5. SLAB THICKNESSES INDICATED ON THE DRAWINGS ARE MINIMUMS. PROVIDE SUFFICIENT CONCRETE TO ACCOUNT FOR STRUCTURE DEFLECTION, SUBGRADE FLUCTUATIONS, AND TO OBTAIN THE TO ACCOUNT ELEVATION AT THE FLATNESS AND LEVELNESS INDICATED.



SECTION
1/2"=1'-0"



SECTION
1/2"=1'-0"

Option 2 Concrete Support

- 8 - Pile Cap (PC2) - 46 Total QTY
- 9 - Pile Cap (PC3) - 48 Total QTY
- 10 - Pile Cap (PC4) - 45 Total QTY
- 11 - Grade Beam, 1'-7" depth - 5,100 Total LF
- 12 - Thickened Slab, 10" depth - 43,000 Total SF
- 13 - Grade Beam (GB1) - 1,500 Total LF

NOT FOR CONSTRUCTION
PRELIMINARY 3/9/18

THESE DWGS ARE NOT COMPLETE. DESIGN IS STILL IN PROGRESS. CONTRACTOR SHALL CARRY APPROPRIATE CONTINGENCY.

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND SHALL REMAIN THE PROPERTY OF BECKER STRUCTURAL ENGINEERS INC. IT SHALL NOT BE REPRODUCED, COPIED, LENT OR DISPOSED OF DIRECTLY OR INDIRECTLY NOR USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT IS SPECIFICALLY FURNISHED AND MUST BE RETURNED TO BECKER STRUCTURAL ENGINEERS INC. ON COMPLETION OF WORK IF REQUESTED.

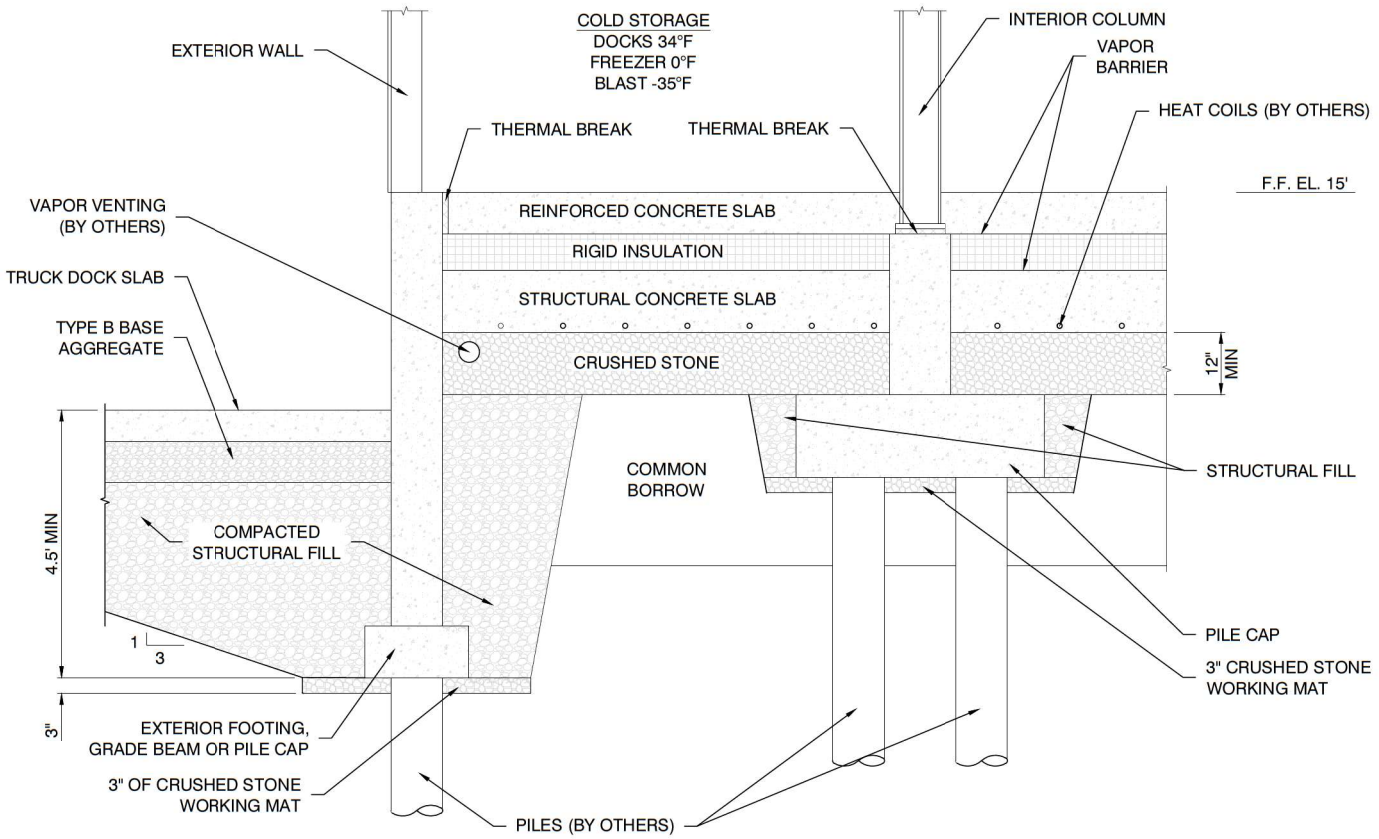
BECKER
75 York Street, Portland, Maine 04101
207.875.1888 • beckerstructural.com

ME PORT AUTHORITY
COLD STORAGE BUILDING

PRELIMINARY UNDERSLAB PLAN

Designed	Scale
EAR	NOTED
Drawn	Date
EAR	3/9/18
Checked	Decker Job Number
DPM	4276

S1



S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN

FOUNDATION DETAIL SKETCH

PROPOSED LOW TEMP WAREHOUSE
460 COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	16-1314	Scale:	Not to Scale
Date :	02/14/2018	Sheet:	4

12. STORMWATER MANAGEMENT

The attached Stormwater Management Plan describes the proposed stormwater management measures for the project, as shown on the design drawings attached to Section 1 of this Report. A USGS map and a soils map are attached to Section 1 and Section 11 of this Report, respectively.

12.1 LIST OF ATTACHMENTS

- Stormwater Management Plan (Bound Separately)

13. URBAN IMPAIRED STREAM

The proposed development is not located within the watershed of an Urban Impaired Stream; the Urban Impaired Stream Standard does not apply.

14. BASIC STANDARD

The proposed development is adjacent to the Fore River; there are no other known protected resources associated with the Site. As shown by the soil survey attached to Section 11 of this Report, the Site is comprised primarily of cut and fill land. The Soil Erosion and Sediment Control Plan and compliance with the Basic Standard is described in the Stormwater Management provided as part of Section 12 of this Report.

During construction, the Contractor will be responsible for conducting inspections in accordance with the attached *Stormwater Erosion & Sediment Control Inspection Report Form* (or equivalent). Inspections shall be performed at least once a week, as well as before and after storm events. A person with knowledge of stormwater management and erosion and sediment control, including the standards and conditions of the permit approvals, shall conduct the inspections and perform maintenance of the facilities. If maintenance or modifications are necessary, implementation will be completed within seven days and prior to any rainfall event. After construction, the Owner will be responsible for inspecting and maintaining the Site's stormwater system.

14.1 LIST OF ATTACHMENTS

- Erosion & Sediment Control Inspection Report Form

EROSION & SEDIMENT CONTROL
INSPECTION REPORT FORM

Inspectors: Date: ___ / ___ / _____

_____ of _____ (Project Owner)
_____ of _____ (Contractor)
_____ of _____
_____ of _____

Storm Event? ☐ Yes ☐ No Rainfall Amount _____ Storm Duration _____ hours

Visual Observations of Activity and Site Conditions:

Disturbed Soil Areas:

Storage Of Soils:

Sediment & Erosion Control Measures:

Construction Site Entrance:

Surface Stabilization:

Corrective Action Taken:

Attachments (if any):

Signature:

Name Title Date

15. GROUNDWATER

The proposed development is not located within a Significant Sand and Gravel Aquifer. As previously noted, the Site is comprised primarily of cut and fill land. Environmental assessments of the Site have been conducted and the Owner is a participant in the Maine Department of Environmental Protection Voluntary Response Action Program (VRAP) as discussed in greater detail in Section 18 of this Report. The proposed development will not infiltrate to or extract groundwater and is not anticipated to result in any impacts to groundwater.

16. WATER SUPPLY

The proposed development will be provided with both fire protection water service and domestic water service as shown on the drawings that will connect to existing water services on the property. Woodard & Curran has been working directly with the Portland Water District to determine the appropriate design for this work. An ability to serve determination will be provided upon receipt.

17. WASTEWATER DISPOSAL

The proposed development will be provided with sanitary sewer service to an existing sewer manhole adjacent to West Commercial Street as shown on the drawings. A Wastewater Capacity Application was submitted to the City under separate cover as part of the Site Plan Application for the proposed development. A copy of the City's determination will be provided upon receipt.

18. SOLID WASTE

18.1 SOLID WASTE

All solid waste materials and recyclables from the proposed development will be transported and disposed of or recycled in accordance with applicable laws and regulations.

18.2 CONSTRUCTION & DEMOLITION DEBRIS

The proposed development will generate construction waste and demolition debris (CDD). The Contractor will be responsible for properly disposing of the CDD. The Contractor will be responsible for handling, managing, and disposing of all waste generated by construction in accordance with the Maine Solid Waste Management Regulations and all other applicable local, state, and federal regulations.

18.3 SPECIAL & HAZARDOUS WASTE

Numerous investigations have been completed to evaluate soil, groundwater, and soil vapor conditions at the Site since 1999. In addition, several active remedial efforts have been completed to address known environmental conditions. These activities have been completed in coordination with the Maine DEP VRAP and related Spills & Site Cleanup programs. Consistent with a Maine DEP VRAP No Action Assurance Letter (NAAL) dated June 1, 2012, the necessary steps that must be taken in order to receive closure and liability protection under the VRAP are summarized below:

1. The existing soil management plan will be revised and submitted to the Maine DEP for review and approval;
2. Any potential soil vapor issues in future on-site structures will either be addressed and characterized with investigation prior to construction or presumptively addressed through installation of vapor collection systems;
3. No potable wells will be installed on the property in the future, and;
4. The property use will remain non-residential use unless other uses are approved by the Maine DEP.

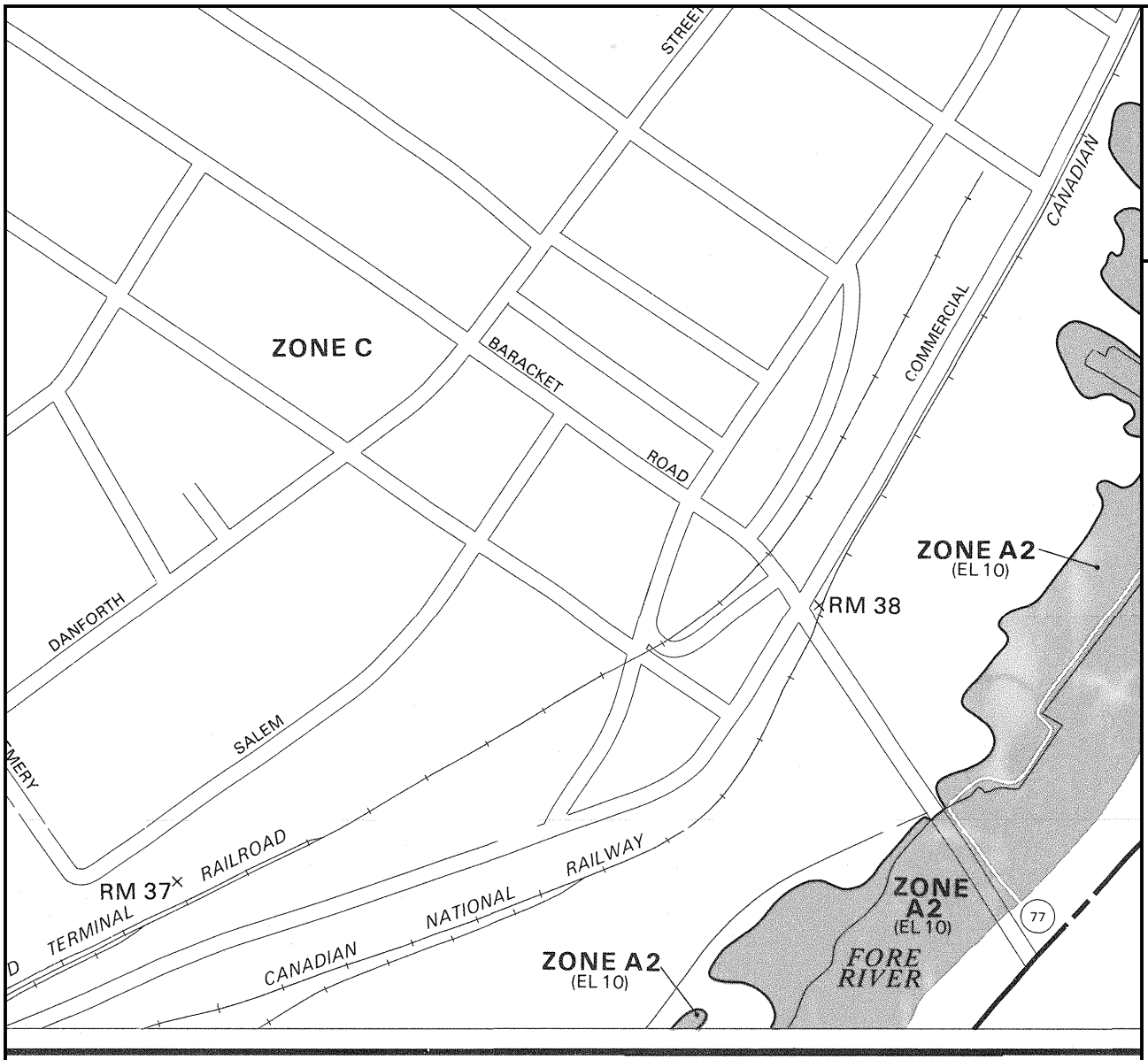
It is anticipated that the Maine DEP VRAP requirements outlined above will be fulfilled as part of the proposed project. Special and hazardous waste encountered during the construction process will be handled, managed and disposed of in accordance with the Maine DEP approved revised soil management plan and all applicable local, state and federal regulations.

19. FLOODING

The proposed development is partially located within a flood hazard zone (A2), as shown on the FEMA Flood Insurance Rate Map attached to this Section. The Base Flood Elevation for the site is 10'. An application for a Flood Hazard Development Permit will be submitted to the City of Portland. The proposed development will not cause or increase flooding or cause an unreasonable flood hazard to any adjacent structures. The flood zones are located along the southern portions of the proposed development, as shown on the drawings.

19.1 LIST OF ATTACHMENTS

- FEMA Flood Insurance Rate Map



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

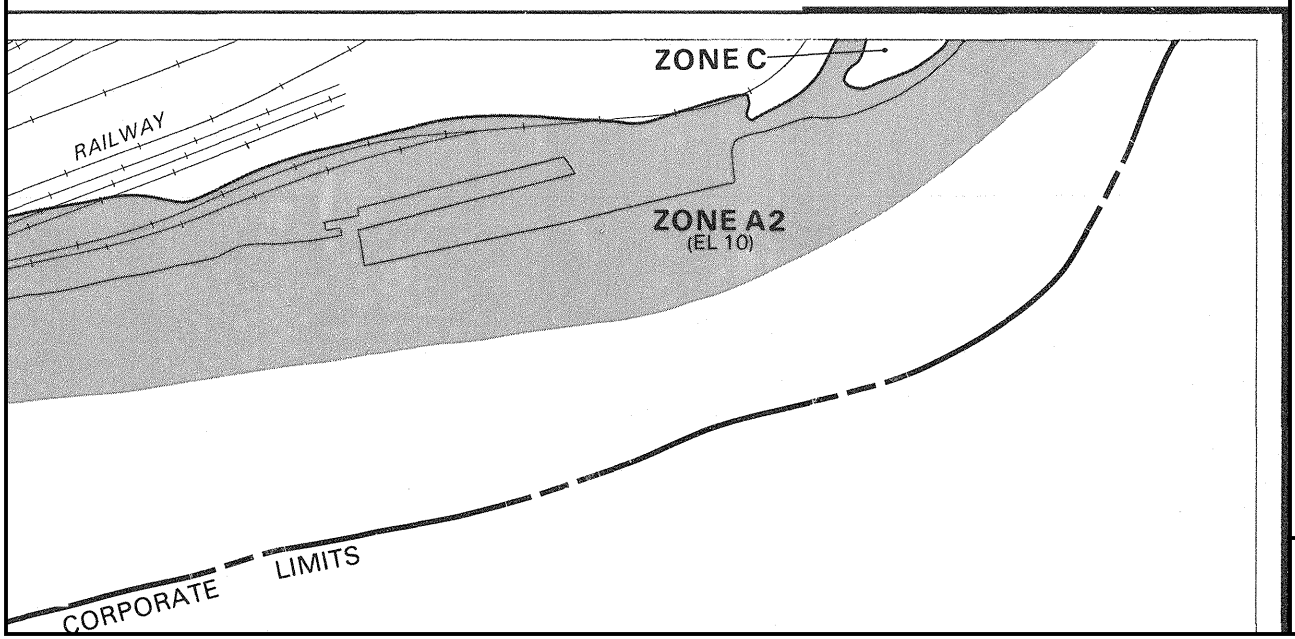
PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 16 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0016 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

20. BLASTING

Based on geotechnical investigations completed to date, no blasting is anticipated for this project. The geotechnical report for this project is attached to Section 11.

21. AIR EMISSIONS

The project is not anticipated to require an air emissions license; this Section is not applicable.

22. ODORS

The proposed development will not involve any processes that emit significant odors; this Section is not applicable.

23. WATER VAPOR

The proposed refrigeration system cooling tower will generate water vapor, but not at a scale that has the potential to change the local climate. Therefore, this Section is not applicable.

24. SUNLIGHT

The proposed development will not block access to sunlight for any structures utilizing solar energy; this Section is not applicable.

25. NOTICES

The City of Portland has Delegated Review Authority for this application; as such, it is our understanding that the public notice requirements associated with MaineDEP Site Law are accomplished through the public notice process by the City of Portland for the Level III Site Plan process.

[redacted]

WOODARD &CURRAN

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

Google Groups

Cold Storage

Carl Cramer <carl1cramer@gmail.com> Apr 16, 2020 10:50 AM
Posted in group: **Planning Board**

I received your notification card about this project.

Even without taking into account the current health and economic devastation of Covid-19, this proposal is preposterous.

Do any of you remember AmeriCold's proposal? It was accepted by the planning board. Only to be subsequently rejected by AmericCold itself as "economically unfeasible." So the MPA wants to build a much larger eyesore, with 40% occupancy to begin.

Here'a a thought -- and I am totally opposed to this project in any fashion: build a building that meets 100% of current shipments, but with the ability to expand if and when it is proven that such a need exists. If I had written this proposal as part of an MBA, it would be rejected without comment.

There is NO WAY any public money should be used for this example of MPA's grandiose impossibilities.

And now let's look at today's economic situation. Do you seriously believe with all the crises facing us, that our economy can support such willful waste? Frankly, I am annoyed this is even being considered at this time. We have so many more important issues facing us.

I have so much more to say about this, but will refrain at this moment.

Not one penny in public funds for this boondoggle.

Thank you for listening.

Carl Cramer
225 York Street
Unit 2
Portland, ME 04102

Google Groups

Cold Storage proposal

david smith <dlsmithmd57@yahoo.com> Apr 17, 2020 11:07 AM
Posted in group: **Planning Board**

Dear Board:

I am writing to strongly oppose the Maine International Cold Storage facility proposal.

1. How do you envision our need for a cold storage facility to go from nothing significant at present, to abruptly rise up to 108,000 square feet? Really? 2-1/2 acres?
If the projections for its future utilization are similar to the process used to justify the purchase of a second crane for our container ship terminal... I live where I can see them loading and offloading the Eimskip vessels. As a retiree, I enjoy watching that process. I can assure you, that in the two years that we have had two cranes there, *never once* have the two cranes been used simultaneously. One is completely idle. All the time. I strongly fear the same gross underutilization for this massive structure. What's wrong with the 40 (or was it 45) foot height restriction?

2. There is a rail spur right next to the container facility...is there any reason this could not be extended/used to carry refrigerator containers to some other property that is not on the waterfront?

3. This will be a major eyesore. Like other construction projects that are not to scale for our pretty little city by the bay, this is going to stick out like the proverbial sore thumb. Nor will it go away in any of our lifetimes. Some legacy.

I am all in favor of business development, but let's keep it to scale, and let's not permanently despoil our town's waterfront property. I would suspect a condo developer could put up a lovely two or three story building here that would generate far more tax revenue for the city, and would be a much better utilization of the little waterfront property that remains undeveloped here in Portland.

Or, here's a counter-proposal that is quality-of-life driven..very anti-business in the short run, but...long-term yield??? Appropriate the land for a waterfront park. Build a West End water access. Or, something akin to what's happening on Thompson's Point, which is siphoning people out of our downtown. Hmmm?

Sincerely,
David L. Smith
24 Brackett St #4
Portland
520.249.8648

Google Groups

Cold Storage on Commercial St.

Davi Smitti <smitti79@gmail.com> Apr 17, 2020 10:12 AM
Posted in group: **Planning Board**

Dear Board members,
I am a resident of Portland and have been watching the rampant construction over the past several years. I am concerned because it seems to be occurring without sufficient thought given to parking issues, and beauty, as well as history of the area. The proposed 75 FOOT high cold storage building is another example of looking for income without looking at the long term ramifications. Every time I approach Portland from the Islands, I am dismayed at the ugly beige tall condo ediface on Fore St. that looms over the harbor from the brow of Munjoy Hill.. We do not need another eyesore. Since there are other options such as rail track extension to move cold storage to a non-seaside facility, or adhering to the 40 ft. height limit which was created for a reason already, I am adamantly against this proposal. Please look at more than dollars. Look at the bigger picture.
Sincerely,
Elizabeth Smith
Portland, ME

Subject: May 12 public hearing: VA Clinic
Date: 2020-05-13 8:06 pm
From: Jo Coyne <jocoyne@gwi.net>
To: Christine Grimando <cdg@portlandmaine.gov>
Cc: Planning Board <planning@portlandmaine.gov>

PC4

Dear Christine: I am writing to share my frustration with the manner in which potential traffic problems associated with the VA clinic were (or, rather, were not) addressed at yesterday's hearing. Somehow Planning Board members seemed to conflate the issues of construction staging and traffic. Maggie Stanley did her best to clarify that the public question about traffic was not about construction vehicles but rather about the long-term implications of having so much development on West Commercial Street. However, even then other board members seemed unconcerned.

I believe one member stated that the Planning Board has no control over which streets drivers choose to use. Residents all along the Danforth Street corridor already are paying a high price for the past few years' development on West Commercial. Both speed and traffic volume on Danforth itself have increased. Formerly quiet residential streets such as Clark, Brackett and York have become cut-throughs for speedsters trying to get out of town at the end of the workday. I would guess that a certain amount of that happens as well on streets that connect Spring to Danforth.

I find the lack of concern about traffic shifting from West Commercial to residential streets somewhat ironic, given the history of the Fore River Parkway. Much emphasis was placed on how the parkway would benefit the neighborhoods by reducing traffic on residential streets. The great thing was...it worked! Now, however, development on West Commercial is driving cars back to our residential neighborhoods and, frankly, city officials don't seem overly concerned. In my opinion, a thorough traffic study of the entire length of Commercial Street and connecting streets is long overdue. Such a study should also examine the impact of West Commercial development on downtown merchants. The current planning process appears to look at individual projects in isolation without considering their cumulative effect. Isn't there a better way?

Thank you. Jo Coyne

Jo Coyne
36 Salem St
Portland ME 04102
207.775.3902
jocoyne@gwi.net

Google Groups

Cold Storage

Melissa Wood <melissafwood@gmail.com> Jun 4, 2020 4:53 PM
Posted in group: **Planning Board**

I received notification about the development of a cold storage warehouse on West Commercial Street. It should not go forward. Here's why:

If Americold couldn't build its dream 120,000-square-foot facility, we were told, it would walk away. But it did anyway.

And yet the Port Authority is still pushing for cold storage on a grand scale. This time, it's not market-driven thanks to subsidies from the DOT, which leaves me confused: If it doesn't make sense in the marketplace why are we still building it? Shouldn't we at least rethink the scale?

I have some ideas. Newspaper articles have described this warehouse as "hotly anticipated" and "long awaited". Developer and former DOT commissioner George Campbell told Maine Biz it would be the "final crowning piece" of his waterfront achievements. He and his colleagues have never justified why it needs to be so huge. Back in March, they predicted using only 40 percent of the space. Given the current environment, they probably need even less. Regardless, does that sound like something we urgently need? My guess is that a "crowning piece" needs to be prominent. Look at what we built. Please. This is not the London Eye or Sydney Opera House.

But much more importantly, this warehouse is a terrible idea. Most of our food supply is based on global trade, but international markets are unpredictable (e.g., lobster tariffs). Imagine if we invested in improving waterfront access and developing more stable regional markets for local fishermen and aquaculture businesses instead? This huge warehouse only serves to convert our local food into an industrialized, low-cost commodity. I believe in a working waterfront, but not this.

When you step back and think about it, the only thing this warehouse will do is turn the Portland waterfront into a transportation hub. It will become a lonely place dominated by the endless rattle of idling diesel engines and generic containers whose insides are a mystery. When the city decided on the slogan, "Yes, Life's Good Here," is this what you envisioned?

We can do better; we can be more creative. There's never been a more appropriate time to rethink what we think we know, and to question what we believe is best. Stop this misguided development before it's too late.

Sincerely,

Melissa Wood
225 York Street, #2

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

Cold storage on Commercial St

Davi Smitti <smitti79@gmail.com> Tue, Jun 16, 2020 at 2:21 PM
To: planning@portlandmaine.gov

Hello,
I am a neighbor to the proposed cold storage facility - living at the water end of Brackett St.
I attended the virtual meeting on 6/10 when the proposal was presented to the neighbors.
Concerns : hours of operation. Semi trucks are required
by law to have back up beeps -meant to be very annoying to get attention. Thus, having trucks arrive before 7 a.m. would be rude and deeply interfere with sleep and quality of life. I would request 8 a.m. but I realize that would be "fighting city hall. "
I realize the height falls within regulations. The new huge Pottland Yacht barn is shorter but in the drawings, the cold storage building does not look higher when it is significantly so. The Portland Yacht barn is a blemish on our views. Please feel free to come to our place and take a real look.
I would propose trees, a large wall or some barrier between the facility and the Eimskip lot to dull the noise of the trucks at the loading dock.
Commercial St. already has lines of semis every day idling waiting to get into the Eimskip lot. This is bad for our environment. There should be restrictions on idling that are enforceable.
As construction is contemplated, please make note that it is a city ordinance that it doesn't start til 7 p.m. Please make this crystal clear to that team. I have lived during construction at other Portland sites and seen this disrespected. It is often mentioned by others in See,clickm,fix complaints. I would deeply appreciate thoughtfulness in this arena.
Thank you for your attention and work.
Elizabeth Smith
24 Brackett St
Portland, ME

Google Groups

Public Comment on Plan Number: PL-001042-2020, West Commercial St. cold storage project

Elizabeth Parsons <ecparsons33@hotmail.com> Jun 18, 2020 4:08 PM
Posted in group: **Planning Board**

To members of the Planning Board and the City's Planning Department:

A review of materials submitted and notes obtained from the recent neighborhood meeting has not clarified if the proposed project will make use of the nearby railroad line. It does appear that the project, as currently envisioned, would entail significant truck traffic. And this project is not the only one going forward on Commercial Street. There's the Veteran's health care building further on towards the bridge that is anticipated to have considerable vehicular traffic involved. And then Hobson's Landing and one or two hotels further towards the Old Port will bring in more cars and trucks as well.

I hope that the Board will carefully review the City's Comprehensive Plan; the joint planning process with South Portland: One Climate Future; and the excellent work being done by the Maine Climate Council particularly on the issue of ***transportation*** as you consider this current project. Transportation is responsible for over half of this state's CO2 emissions and global CO2 parts per million are now over 417, far higher than ever in human history

A basic question to probe should be:

- How does the project's plan for transport to/from the building align with not only our City's goals but the necessity of doing much more than we are currently to reduce fossil fuel emissions?

Thank you for considering these comments.

Sincerely,
Elizabeth C. Parsons
44 Winter Street

A prohibited use in the WPDZ

June 18, 2020

To Chairman Mazer and members of the Planning Board:

The Waterfront Port Development Zone is designed to prevent truck-centric developments – like this proposed warehouse – along a narrow stretch of Portland's deep-water frontage. The applicant has said Eimskip's maritime customers would use up to 40% of the warehouse. If one accepts that exceedingly optimistic estimate,[1] then non-maritime cargo transported by tractor trailers would fill at least 60% of the storage space.

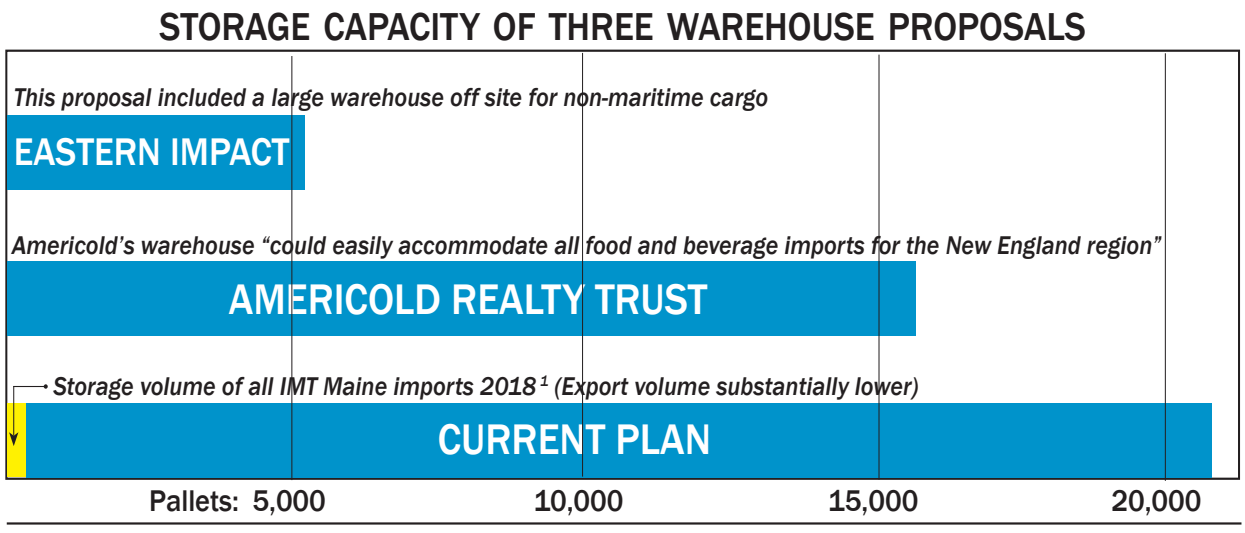
With that exponential increase in truck traffic, WPDZ restrictions would prohibit the International Marine Terminal from being a permitted "intermodal transportation facility." Consequently, the zoning definition of truck terminal, "a facility primarily for handling and storage of goods transported by tractor trailers," would apply to this warehouse.[2] And truck terminals are a prohibited use in the WPDZ.

Moreover, this proposal fails to meet both overarching requirements of the port zone. Developments are limited primarily to those "dependent upon deep water" *and* "which contribute to port activity."

• Even the broadest definition of deep-water dependence would exclude cargo that arrives and leaves by tractor trailer. The warehouse would be dependent on West Commercial Street, not the Fore River.

• The warehouse would have an adverse impact on port activity by adding significant traffic – and noxious pollution from each refrigerated truck's two engines.[3] Sixty percent non-maritime cargo would generate about 20,000 tractor-trailer trips annually at the IMT, conservatively.[4] Adjusting for partial loads and thousands of empty loads (after deliveries and before pickups), unnecessary tractor-trailer trips would exceed 40,000, and higher yet if maritime storage volume realistically remained below 25% in the warehouse for decades to come.

• The IMT has one of the smallest footprints among U.S. container ports, and quadrupling the project's size for non-maritime customers would adversely impact future marine uses.[5] The development site would best contribute to the port's continued expansion[6] if used as much as possible for essential marine-related needs – rather than exclusively for a warehouse to store frozen food rarely to arrive or leave by cargo ship.



The applicant is seeking to build a warehouse with 33% more capacity than one previously proposed by Americold.[7] Yet credible analysis of maritime-storage demand is lacking. In fact, a market-analysis summary from the applicant does not even mention maritime cargo.[8] Rather, it stresses the need for a "distribution center," partly driven by "ecommerce and home delivery," for frozen-food products trucked into Portland's congested urban core.

For most cargo that arrives by ship, Portland is simply a transfer point before the refrigerated containers leave via I-95. Out-of-state and Canadian companies import about 90% of the terminal's refrigerated cargo, and most have financial and operational reasons to move containers to their own cold storage, or to public cold storage near their facilities.[9]

Those companies are IMT shipping customers – not IMT storage customers. That helps explain Eimskip's growth in Portland without nearby cold storage, except for an older Americold facility on Read Street (which would have a competitive edge over any IMT warehouse for local low-value product like bait fish).

As for refrigerated exports, volume is modest compared to imports. Moreover, many Maine exporters – including pharmaceutical, wild blueberry and potato product companies – operate their own cold storage. Blueberry processors, for instance, have invested heavily in cold storage over the past decade. Their exports, trucked from Down East, are loaded directly onto Eimskip vessels.

A local consortium, mindful of the zoning and logistical problems of a massive IMT warehouse, envisioned a smaller facility – yet large enough to accommodate substantial future growth of maritime cargo. Eastern Impact LLC, together with a top-ten cold storage company, proposed a waterfront warehouse one quarter the size of the current proposal. In tandem, the local consortium planned to build a much larger warehouse off site for non-maritime cargo, value-added services and distribution.[10]

That right-sized IMT warehouse would already be storing maritime cargo, but the Port Authority rejected the concept twice, in 2015 and 2017. Instead it financed a campaign for zoning changes to allow construction of Americold's facility, which "could easily accommodate all food and beverage imports for the New England region," according to the company.[11]

During its independent lobbying for the Americold project, the Port Authority commissioned maritime-storage analysis that stretched credulity with inflated numbers.[12] But that faulty analysis could not override the reality of limited demand for IMT maritime storage – a primary constraint on Americold's profitability prospects. In 2018, for instance, 100% of Maine's refrigerated imports would have filled about 1% of the warehouse.[13] Americold abandoned the plan two years ago, saying it failed the company's "underwriting criteria."[14]

Now the Planning Board is being asked to approve a larger warehouse that flouts the letter and spirit of the Waterfront Port Development Zone in order to maximize the project's building envelope.[15] The applicant has not shown how the warehouse would be dependent on deep water, nor how it would provide a net-positive contribution to port activity. Most critically, the proposal fits the definition of a prohibited truck terminal, and its construction would cause irreparable damage to the port development zone. The application should be denied.

Sincerely,



Mark McCain
45 Summer Street, Portland, Maine 04102
walworthmccain@maine.rr.com

[1] 40% of the warehouse space would accommodate about 130,000 pallets of frozen product annually, assuming an average pallet turnover of 16 per year. (In its RFP proposal, page 16, Americold specified a 25% faster turnover of 20 per year.) Maine companies imported 37 refrigerated containers during the fourth quarter of 2018, the most recent period analyzed, or about 3,000 pallets on an annualized basis. That equals 1% of the warehouse space if every pallet was stored on site. (37 forty-foot containers x 20 pallets each x 4 quarters in 2018 = 2,960 pallets.)

"Up to 40%" comment from George Campbell of Treadwell Franklin Infrastructure Capital, a development partner of the proposed Maine International Cold Storage Facility, *"Developers Revive Plans for Cold Storage Facility on Portland Waterfront"* Portland Press Herald 3/5/2020. Affirmed in a 3/18/2020 email from the development team: "Maine's need for imported food products is growing and will continue to grow; it is expected that the facility will be used to store some of these products. Eimskip intends to use up to 40% of the facility for its own customers."

[2] The Sec. 14-47 definition of truck terminal includes an exception: It "does not apply to truck activity incorporated into or ancillary to an Intermodal Transportation Facility." Intermodal facilities are a permitted use in the Waterfront Port Development Zone – but only if "principally for vessels with regularly scheduled destination service or for railroad transportation service" (Sec. 14-319). With the addition of this warehouse, storing primarily cargo transported both ways by truck, the International Marine Terminal would not clear that hurdle.

Tractor trailers would be the principal mode of transportation in the IMT, not vessels or rail. Therefore, the IMT could not be permitted as an intermodal facility, and the warehouse would be a prohibited "truck terminal" as defined in Sec. 14-47: "a facility primarily for handling and storage of goods transported by tractor trailers."

(If two separate parcels – 10 acres owned by the city, including the Eimskip pier, and 18 acres owned by the state, including the proposed warehouse – cannot be permitted as a single intermodal facility, then any arguments supporting this proposal collapse even quicker. Permitting only the 10-acre parcel with the Eimskip pier as an intermodal facility, then defining the warehouse truck activity as "ancillary," would not be allowable. The majority of that truck activity would be independent of the International Marine Terminal – not ancillary. But more importantly, that parcel by itself does not include the multiple modes of transportation necessary to meet the definition of an "intermodal transportation facility.")

Estimated weekly transportation of containers at the IMT, including the proposed warehouse:

- **330 loaded 40-foot containers transported by vessel**, maritime, either incoming or outgoing (120% of 2019 volume, which was 14,300 40-foot containers, or 275 weekly)
- **718 loaded 40-foot containers transported by tractor trailer:**
  330 by tractor trailer, maritime, either incoming or outgoing (including warehouse volume)
  388 by tractor trailer, non-maritime loaded containers, half incoming, half outgoing (60% of warehouse storage space)
- Negligible by rail

(Current rail transport of IMT containers is essentially nonexistent. Nationwide, primarily dry containers, not "reefers," are shipped by rail – typically long distances. IMT non-maritime cold storage would be regional, with short-haul trucking of containers to and from the warehouse.)

The warehouse truck volume is based on a conservative pallet turnover rate of 16 per year. Using Americold's annual turnover rate of 20 pallets, 60% non-maritime cargo would generate **485 warehouse container** shipments weekly – for a tractor-trailer total of 829 loaded 40-foot containers. (See footnote no. 4 for container calculations.) Moreover, maritime storage likely

would fill less than 40% of the warehouse, thereby increasing the volume of non-maritime truck traffic. And many tractor trailers would carry partial loads – especially with the applicant's intention to provide supermarkets and other customers with just-in-time shipments.

"Cold storage facility" is a conditional WPDZ use, but that is superseded by the prohibited use of "truck terminal" for this proposal. Additionally, the warehouse would not be "compatible with water dependent and marine uses," as required of conditional uses (Sec. 14-320). A cold-storage facility storing +/-75% marine freight likely could be shown to be compatible with water dependent and marine uses, but not one storing +/-25% marine freight – some of the reasons having been outlined in this letter.

[3] The adverse impact would include significant exhaust and diesel soot, both to the IMT and its environs. Refrigerated tractor trailers are especially toxic because highly polluting auxiliary engines operate continuously for cooling. Those diesel engines are essentially unregulated, and emit up to six times as much nitrogen oxide and 30 times as much fine-particulate soot as primary truck engines.

[4]Calculations for 20,000 trips:
Americold estimated that a 15,000-pallet warehouse could store +/-300,000 pallets yearly, i.e., an average annual turnover of 20 pallets per pallet position. For 60% non-maritime cargo in the proposed warehouse, assuming all full trailer loads:
21,000 pallet positions x 20 turnovers x 0.6 share ÷ 20 pallets/trailer x 2 arrival/departure = 25,200 fully loaded tractor-trailer trips annually or 485 trips weekly.

Reducing the pallet turnover rate by 20% to be conservative, 16 turnovers per year would generate 20,160 one-way trips annually or 388 weekly. That count does not include empty loads, after deliveries and before pickups. (The applicant has estimates a maximum of 140 one-way truck trips daily. Multiplied by 7, 60% of that estimate is 588 weekly trips, both full and empty.)

[5] Non-maritime cold storage at U.S. container ports is virtually nonexistent, and rarely do ports even elect to use waterfront acreage for maritime cold storage. The closest cold storage to Eimskip's previous U.S. port of call in Norfolk, VA, for instance, is six miles from the port.

[6] The IMT has seen significant growth since 2013, and the applicant predicts freight volume will increase by 30% to 50% over the next two years. But estimating IMT growth is hardly an exact science: In a 2016 federal grant application, the Port Authority predicted "line-of-sight growth targets to exceed 50,000 containers by 2020" – or in excess of 100,000 TEUs ("twenty-foot equivalent units"), about 60% by vessel, and 20% each by rail and barge. Last year the IMT handled 28,600 TEUs – less than 30% of the Port Authority estimate for 2020 volume.

[7] The current proposed capacity of +/-21,131 pallets (see footnote no. 15) would be 33% larger than Americold's final design for 15,864 pallets.

[8] PowerPoint slide from the development team, 5/7/2020:
Market Analysis Preliminary Conclusions
We have uncovered four key learnings in confirming and validating the need for additional cold storage capacity:
1. There is pent up and immediate demand for a local/regional cold storage warehouse
2. This demand for a state-of-the-art cold storage facility is coming from in state processors, growers and grocery retailers that now depend on out of state cold storage operators...which is costly and unsustainable

3. The COVID crisis has surfaced the need for food chains and cold storage to become more local and much more functional in assuring a more flexible and responsive food supply
4. In addition, spikes in ecommerce and home delivery will not abate anytime soon, and can only be accommodated by a modern refrigerated distribution center that has the flexibility and functionality to accommodate a wide range of current and evolving needs for consumers and the community

[9] The seafood importer High Liner Foods, for instance, has cold-storage capacity for 24,000 pallets in its New Hampshire and Massachusetts warehouses.
One snapshot of IMT import volume: During the fourth quarter of 2018, Eimskip offloaded approximately 470 refrigerated 40-foot containers (about 20 pallets each). That represents a storage volume of about 2,400 pallet positions on an annualized basis, or about 11% of the proposed warehouse, assuming a pallet turnover of 16 per year.
However, supply-chain executives at the two consistently largest importers (Q4 2018, 24% share of imports) have said they do not plan to use IMT cold storage: High Liner Foods of Peabody, MA, and Lindt & Sprungli USA of Stratham, NH. Two other top importers, Atlantika Inc. of New Canaan, CT, and Nordic Group Inc. of Boston, have said the same. Smaller out-of-state importers were not contacted about their storage needs.

[10] Compared to a single warehouse shoehorned into a congested area, Eastern Impact's dual-location proposal offered the opportunity to develop a more powerful economic engine for Maine. The off-waterfront warehouse could be part of a so-called "inland port," similar to ones other states have established, usually with daily rail transportation to the companion water port. With the availability of lower-cost land, the inland ports provide economical and efficient freight distribution, dry storage, customs clearance, container storage and transshipments. They nurture small businesses by leasing space and equipment in their distribution facilities. In addition, inland ports provide easier access for non-maritime users of port services (such as customs clearance for companies like L.L. Bean).

An excerpt from a 2017 letter, Eastern Impact to Port Authority board members:
"As a member of the local community committed to sustainable waterfront development, we would like to bring to your and the public's attention that there are other concepts for the project, including our original proposal, that have yet to be fully explored . . . Our approach from the beginning has been to work with potential customers in Maine and New England to define the most viable cold storage concept for the region while taking into account all stakeholder needs. Reissuing the RFP will allow for a fresh process to ensure that as many of the benefits of the project as possible accrue within the State of Maine and New England to our agriculture, aquaculture, fishing, food and beverage industries, the West End neighborhood and the local tax base and economy." (The Port Authority did not re-issue an RFP.)

[11] Americold RFP submission, 9/4/2015, page 12.

[12] "Proposed State of Maine West Commercial Street Cold Storage Facility: Model of Eimskip Cold Storage Need," Woodard & Curran, 4/24/2017. (Rebuttal: "Analysis of Woodard & Curran Study," Tom Robinson, 5/1/2017.) Among the report's significant errors was the assumption that an on-site warehouse would store 100% of IMT refrigerated imports.

[13] In Q1 2014, Maine companies imported 36 refrigerated containers (13% share of 288 total). In Q4 2018, they imported 37 containers (8% share of 470 total). That represents a negligible increase for Maine imports over four years; a +70% increase for customers outside Maine. The Maine cargo (about 3,000 pallets, annualized) would have filled 1% of the Americold warehouse (150 pallet positions), assuming turnover as stated in Americold's RFP submission.

[14] Americold statement, 6/25/2018: "After three years of careful study, Americold has decided to forgo development of a new facility at the 40 West Commercial Street site along the Fore River in Portland. We have considered the regional economics, construction costs, and industry analysis, and our conclusion is that the cost to operate a state-of-the-art temperature-controlled facility on the 6.6-acre parcel of land at the waterfront does not meet Americold's underwriting criteria."

[15] On October 7, 2019, the warehouse design team met with a group of West End residents to share "initial conceptual ideas." A team member said the Port Authority intended to obtain necessary approvals and permits, then a private entity would proceed as the project developer. The stated capacity was 21,131 pallets. Jon Nass, CEO of the Maine Port Authority, was not present.

One month later, a West End neighborhood leader talked with Mr. Nass, and reported back to other residents that according to Mr. Nass there had been a misunderstanding: The design discussed on October 7 was only an exercise to show maximum optimization of the site; a private developer would determine the actual building size and capacity based on its own market research.

However, during a May 7 remote meeting with a group of West End residents, after the current development team had taken over the project, a team member said the warehouse capacity was essentially unchanged from the conceptual plan's 21,131 pallets: "The amount of pallets stored within are roughly the same, within a few hundred."

Google Groups

Cold Storage Warehouse on West Commercial St.

Barbara Wood <barbawood@yahoo.com> Jun 23, 2020 10:23 AM

Posted in group: **Planning Board**

I'm guessing that eventually something is going to be built on the lot being discussed for this project. No one is going to want to look at a long and tall wall of any size.

I have read that that side of the building will be painted with different colors to give it a more human scale. I would suggest that in addition to color you also look at design. I worked In Management at LL Bean in Distribution thru the building of several warehouses. We got better at trying to build in some design features so that neighbors were not looking at a large box. Some silo like features were created to bring in the feel of barns in this once farmland area. Some color design on the sides of the buildings was also used to create the sense of rolling fields.

With the maritime history of our waterfront I believe some creative designers could come up with some design features, as well as colors, to give it a more appropriate look for the area.

I'd be happy to help facilitate a conversation with engineers who were involved in those projects at LL Bean.

Best,

Barb Wood

125 Emery St.

Portland Maine Yes. Google's good here.

Christian Roadman <croadman@portlandmaine.gov>

Subject: Cold Storage proposal

Davi Smitti <smitti79@gmail.com> Thu, Jun 25, 2020 at 5:41 PM
To: planning@portlandmaine.gov

I've made two other comments, but now that I've reviewed their detailed proposal, one new thought:

--this facility should not get a waiver for the stormwater run-off fee...my run-off goes to almost the exact same spot. Or, to acquiesce to their argument, if they get a waiver, then so should much of the West End!

Thnx for your attention,

David Smith
24 Brackett St #4
Portland.

Google Groups

Opposition to Cold-Storage Warehouse

Vanessa Janes <vanessamariejanes@gmail.com> Aug 13, 2020 9:38 AM
Posted in group: **Planning Board**

Dear Planning Board,

I am a Portland resident and would like to register my opposition to the proposed cold-storage warehouse. This warehouse would not support local fishermen and would be detrimental to my neighborhood by increasing traffic and pollution. Please put a stop to this plan!

Sincerely,
Vanessa Janes
92 Salem St.
Unit 2
Portland, ME

Google Groups

Cold-Storage Warehouse Opposition

Adam Janes <w.adam.janes@gmail.com> Aug 14, 2020 1:07 PM
Posted in group: **Planning Board**

Dear Planning Board,

I am a West End Portland resident and would like to register my opposition to the proposed cold-storage warehouse. This warehouse would not support local fishermen and would be detrimental to my neighborhood by increasing traffic and pollution. Please put a stop to this plan!

Sincerely,
W. Adam Janes
92 Salem St.
Unit 2
Portland, ME

August 18, 2020

To Chairman Mazer and members of the Planning Board:

According to the developer of the cold-storage warehouse proposed for Portland's International Marine Terminal, the coronavirus crisis has generated a surge in refrigerated food imports.

However, data from U.S. Customs and Border Protection shows that Maine companies imported fewer than 1,200 refrigerated pallets during the first half of this year.* Refrigerated exports were much lower.

All of that vessel-transported frozen food would fill **less than 1.5% of the warehouse**, with its annual storage capacity of about 250,000 to 400,000 pallets. But even that percentage overstates storage demand. Some companies would continue to use privately owned cold storage or less expensive public storage within two hours of the port.

The huge disconnect between warehouse size and maritime demand should concern anyone examining this proposal for the Waterfront Port Development Zone. It is impossible to reconcile how this warehouse, with almost entirely non-waterborne cargo, could be considered *"compatible with water dependent and marine uses,"* as required of conditional WPDZ uses.

Moreover, by adding tens of thousands of tractor-trailer trips annually to Portland's urban streets, this warehouse would exacerbate congestion and diesel pollution, while creating costly inefficiencies for the vast majority of cold storage customers best served by a non-urban warehouse with good Interstate and rail access.

Despite massive oversizing of the project, and despite the WPDZ's clear statement of purpose – *"This zone exists to ensure the continued viability of the Port of Portland"* – this warehouse actually would exclude storage of a primary product for lobster fishermen, whose economic contribution to our state greatly exceeds that of all other seafood harvesters combined: No space would be available for fresh locally-caught bait fish.

Yet space would be available every year for more than a hundred million pounds of frozen peas and pizza, chicken nuggets and corn dogs, packed onto pallets by the hundreds of thousands, arriving at the maritime port by tractor trailer, and leaving the same way.

Approval of this warehouse would make a mockery of the priorities and goals of Portland's Waterfront Port Development Zone.

Sincerely,

The Undersigned Portland Neighbors

Irit Altman, 57 Clark Street
Linwood Ashton, 30 West Street
Claudia Bantz, 100 Neal Street
David Bantz, 100 Neal Street
Karin Lindholm Belsheim, 15 Clifford Street
Doug Berry, 2b Summer Street
Aimèe Bessire, 314 Danforth Street
Mark Bessire, 314 Danforth Street
Constance Bloomfield, 382 Danforth Street
Nick Burnett, 5 Briggs Street
Marsha Campbell, 108 Salem Street
Deb Chase, 4 Orchard Street
Jo Coyne, 36 Salem Street
Carl Cramer, 225 York Street
Sarah P. Daignault, 350 Danforth Street
Eli Dale, 40 Salem Street
Wm. Norris Dale, 40 Salem Street
Louise L. Davis, 24 Brackett Street
Kevin Dowling, 174 Danforth Street
Victoria Dowling, 174 Danforth Street
Theolonius Dutton, 57 Clark Street
Ruth Elkin, 24 Richardson Street
David Fenton, 50 Western Promenade
Anthony Filippone, 225 York Street
Michelle Filippone, 225 York Street
Bob Fiske, 263 York Street
Margaret L. Freeman, 45 Park Street
John Funk, 4 Orchard Street
Justin Funk, 90 Salem Street
Karen Geraghty, 15 Briggs Street
Rosanne Graef, 30A Salem Street
Steve Graef, 30A Salem Street
Peter Green, 11 Summer Street
Devie Hamlen, 358 Danforth Street
Rachael Harkness, 25 Summer Street
Seth Harkness, 25 Summer Street
Brian Harris, 17 Summer Street
Alison Hawkes, 17 Summer Street
Lawrence Hayden, 671 Auburn Street
Derek Hengstenberg, 37 Salem Street
Jennifer Hunter, 37 Salem Street
Samar Post Jamali, 358 Danforth Street
Vanessa Janes, 92 Salem Street
William Adam Janes, 92 Salem Street
Edward Kaynor, 88 Vesper Street
Leslie Kaynor, 88 Vesper Street
Carol Kelly, 15 Briggs Street
Adam King, 263 York Street

Rachel Kobasa, 263 York Street
Susan LoGiudice, 5 Briggs Street
Mark McCain, 45 Summer Street
Bill McFarlane, 382 Danforth Street
Sara Miller, 96 Salem Street
Margot Milliken, 159 Pine Street
Steve Morrison, 158 Danforth Street
Caitlin Mushial, 36 Clark Street
Erik Mushial, 36 Clark Street
Wyatt Mushial, 36 Clark Street
Elizabeth Parsons, 44 Winter Street
Lin Parsons, 44 Winter Street
Leslie Pohl, 263 York Street
Darcy Brennan Poor, 15 Vaughan Street
Kent Redford, 198 Danforth Street
Frank Reilly, 168 York Street
Sharon Reilly, 168 York Street
Dena Riegel, 41 Lucas Street
John Robertson, 336 Danforth Street
Sonia Robertson, 336 Danforth Street
Ashley Salisbury, 26 Brackett Street
Karen Sarfaty, 46 Salem Street
Pamela Shaw, 198 Danforth Street
Pamela W Shelton, 225 York Street
Charles Skold, 59 State Street
David L. Smith, 24 Brackett Street
Elizabeth A. Smith, 24 Brackett Street
Gail Spaien, 31-35 Salem Street
Simon Thompson, 14 Winter Street
Deborah J. Towle, 100 Salem Street
Gary Wagner, 31 Brackett Street
Cornelia Walworth, 45 Summer Street
Shoshannah White, 39 Brackett Street
Melissa Wood, 225 York Street

cc: Mayor Kate Snyder
District 2 Councilor Spencer Thibodeau
City Manager Jon Jennings
Christine Grimando, Director, Planning & Urban Development Department

* Maine import volume is based on bills of lading for refrigerated containers offloaded between January 1 and June 30 at the International Marine Terminal this year. If not specified in its bill of lading, a 40-foot container was assumed to hold 30 pallets (which is well above the seafood industry average).

Bristol Seafood LLC and Nova Seafood Ltd., both of Portland, imported 1,001 pallets of frozen seafood. Cape Seafood LLC of Saco, J&K Lobster Bait Inc. of Columbia Falls, and Ready Seafood Co. of Saco imported 188 pallets of lobster bait.

Those 1,189 pallets were shipped in 52 containers. By comparison, one out-of-state company that operates its own cold-storage facilities, High Liner Foods, imported 187 refrigerated containers during this period. Other companies with operations and cold storage located outside Maine imported 776 containers.

Recently quoted in the *Portland Press Herald*, Angelo Ciocca, president of Nova Seafood said: "The major buyers of frozen seafood are south of Maine, and they will probably not be storing seafood in Portland. ... What we need is a smaller freezer to serve mostly the local seafood industry. That would leave land to build processing space for our growing aquaculture businesses, and space for seafood processing and distribution businesses who otherwise must move off the peninsula to grow."

Estimated capacity of the proposed +/-21,000-pallet warehouse is based on two benchmarks: For an earlier IMT proposal, Americold projected its warehouse would have an annual turnover of 20 pallets per pallet position, while a Woodard & Curran report commissioned by the Maine Port Authority estimated 12 pallet turnovers. That represents a storage range of 252,000 to 420,000 pallets for the current proposal.

August 18, 2020

To Chairman Mazer and members of the Planning Board:

According to the developer of the cold-storage warehouse proposed for Portland's International Marine Terminal, the coronavirus crisis has generated a surge in refrigerated food imports.

However, data from U.S. Customs and Border Protection shows that Maine companies imported fewer than 1,200 refrigerated pallets during the first half of this year.* Refrigerated exports were much lower.

All of that vessel-transported frozen food would fill **less than 1.5% of the warehouse**, with its annual storage capacity of about 250,000 to 400,000 pallets. But even that percentage overstates storage demand. Some companies would continue to use privately owned cold storage or less expensive public storage within two hours of the port.

The huge disconnect between warehouse size and maritime demand should concern anyone examining this proposal for the Waterfront Port Development Zone. It is impossible to reconcile how this warehouse, with almost entirely non-waterborne cargo, could be considered *"compatible with water dependent and marine uses,"* as required of conditional WPDZ uses.

Moreover, by adding tens of thousands of tractor-trailer trips annually to Portland's urban streets, this warehouse would exacerbate congestion and diesel pollution, while creating costly inefficiencies for the vast majority of cold storage customers best served by a non-urban warehouse with good Interstate and rail access.

Despite massive oversizing of the project, and despite the WPDZ's clear statement of purpose – *"This zone exists to ensure the continued viability of the Port of Portland"* – this warehouse actually would exclude storage of a primary product for lobster fishermen, whose economic contribution to our state greatly exceeds that of all other seafood harvesters combined: No space would be available for fresh locally-caught bait fish.

Yet space would be available every year for more than a hundred million pounds of frozen peas and pizza, chicken nuggets and corn dogs, packed onto pallets by the hundreds of thousands, arriving at the maritime port by tractor trailer, and leaving the same way.

Approval of this warehouse would make a mockery of the priorities and goals of Portland's Waterfront Port Development Zone.

Sincerely,

The Undersigned Portland Neighbors

Irit Altman, 57 Clark Street
Linwood Ashton, 30 West Street
Claudia Bantz, 100 Neal Street
David Bantz, 100 Neal Street
Karin Lindholm Belsheim, 15 Clifford Street
Doug Berry, 2b Summer Street
Aimèe Bessire, 314 Danforth Street
Mark Bessire, 314 Danforth Street
Constance Bloomfield, 382 Danforth Street
Nick Burnett, 5 Briggs Street
Marsha Campbell, 108 Salem Street
Deb Chase, 4 Orchard Street
Jo Coyne, 36 Salem Street
Carl Cramer, 225 York Street
Sarah P. Daignault, 350 Danforth Street
Eli Dale, 40 Salem Street
Wm. Norris Dale, 40 Salem Street
Louise L. Davis, 24 Brackett Street
Kevin Dowling, 174 Danforth Street
Victoria Dowling, 174 Danforth Street
Theolonius Dutton, 57 Clark Street
Ruth Elkin, 24 Richardson Street
David Fenton, 50 Western Promenade
Anthony Filippone, 225 York Street
Michelle Filippone, 225 York Street
Bob Fiske, 263 York Street
Margaret L. Freeman, 45 Park Street
John Funk, 4 Orchard Street
Justin Funk, 90 Salem Street
Karen Geraghty, 15 Briggs Street
Rosanne Graef, 30A Salem Street
Steve Graef, 30A Salem Street
Peter Green, 11 Summer Street
Devie Hamlen, 358 Danforth Street
Rachael Harkness, 25 Summer Street
Seth Harkness, 25 Summer Street
Brian Harris, 17 Summer Street
Alison Hawkes, 17 Summer Street
Lawrence Hayden, 671 Auburn Street
Derek Hengstenberg, 37 Salem Street
Jennifer Hunter, 37 Salem Street
Samar Post Jamali, 358 Danforth Street
Vanessa Janes, 92 Salem Street
William Adam Janes, 92 Salem Street
Edward Kaynor, 88 Vesper Street
Leslie Kaynor, 88 Vesper Street
Carol Kelly, 15 Briggs Street
Adam King, 263 York Street

Rachel Kobasa, 263 York Street
Susan LoGiudice, 5 Briggs Street
Mark McCain, 45 Summer Street
Bill McFarlane, 382 Danforth Street
Sara Miller, 96 Salem Street
Margot Milliken, 159 Pine Street
Steve Morrison, 158 Danforth Street
Caitlin Mushial, 36 Clark Street
Erik Mushial, 36 Clark Street
Wyatt Mushial, 36 Clark Street
Elizabeth Parsons, 44 Winter Street
Lin Parsons, 44 Winter Street
Leslie Pohl, 263 York Street
Darcy Brennan Poor, 15 Vaughan Street
Kent Redford, 198 Danforth Street
Frank Reilly, 168 York Street
Sharon Reilly, 168 York Street
Dena Riegel, 41 Lucas Street
John Robertson, 336 Danforth Street
Sonia Robertson, 336 Danforth Street
Ashley Salisbury, 26 Brackett Street
Karen Sarfaty, 46 Salem Street
Pamela Shaw, 198 Danforth Street
Pamela W Shelton, 225 York Street
Charles Skold, 59 State Street
David L. Smith, 24 Brackett Street
Elizabeth A. Smith, 24 Brackett Street
Gail Spaien, 31-35 Salem Street
Simon Thompson, 14 Winter Street
Deborah J. Towle, 100 Salem Street
Gary Wagner, 31 Brackett Street
Cornelia Walworth, 45 Summer Street
Shoshannah White, 39 Brackett Street
Melissa Wood, 225 York Street

cc: Mayor Kate Snyder
District 2 Councilor Spencer Thibodeau
City Manager Jon Jennings
Christine Grimando, Director, Planning & Urban Development Department

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Google Groups

Cold Storage Warehouse

sheila filipone <safrncs@gmail.com> Aug 19, 2020 2:44 PM
Posted in group: **Planning Board**

Dear Planning Board Members:

Thank you for hearing my concerns regarding the proposed Fore River cold storage warehouse site. Although I'm a resident of South Portland, I conduct most of my business and recreational activities in Portland, as do the majority of my friends and neighbors.
The proposed facility would worsen traffic and pollution issues. Such an installation would also be a blight on the architecturally significant working waterfront, an area that draws thousands from all over the world for the pleasure of experiencing its uniqueness and charm.
Putting a gigantic cold storage structure on the waterfront (an increasingly rare and valuable resource to Portlanders and Mainers at large), would be the equivalent of parking a refrigerator on your front lawn. Consider the old song: " "Don't it always seem to go
That you don't know what you've got til it's gone..."
Thank you for your consideration,
Respectfully,
Sheila Filippone
148 Breakwater Drive, #8,
South Portland, ME 04106

Google Groups

Maine International Cold Storage

Marsha Campbell <salemstreetbb@gmail.com> Aug 31, 2020 9:19 AM
Posted in group: **Planning Board**

Dear Planning Board,

I am writing about the Maine International Cold Storage facility proposal. I am a resident of the West End who received a postcard on this project. Frankly, I was incredulous and hoped it would go no farther, but it appears you are going on with this plan. I oppose it for many reasons.

1. It's too big, (you admit it is way more than the current need). It will block views of the waterfront and be a huge eyesore.

2. Truck traffic if a big concern for many reason: noise, pollution and traffic congestion

3. You do not seem to be taking into consideration the overall impact to the city's general need for a beautiful, peaceful and healthy environment, one that all the residents can enjoy. An industrial building of this size should be built in an industrial park far from the center of the city!

Others have expressed their concerns more eloquently. I feel there are many of us who feel strongly about this but do not write, none the less, this is our city, too, and we care a lot about it being a strong, thriving and LIVABLE one for all the residents of all classes and back grounds.

Sincerely yours,

Marsha Campbell
108 Salem Street
Portland, ME 04102

Google Groups

Cold Storage Project

John Funk <wjohnfunk@hotmail.com> Aug 31, 2020 9:14 AM
Posted in group: **Planning Board**

To Planning Board Members:
We are mystified by the seeming determination of the Board to move forward with this oversized, unnecessary project. Planning should be based on fact, not speculation. You have been presented with ample evidence that the size of the proposed facility is greatly in excess of need, and yet you persist in moving forward with its approval. Perhaps you are motivated by the phrase "If you build it, they will come" from Field of Dreams. But the facts suggest otherwise, and once the facility is built there will be no undoing of its visual impact on this area of the City. Please defeat this project and require one that is more tailored to need.
John Funk
Deborah Chase
4 Orchard Street
Portland, ME 04102

Public comment for plan number CU-001146-2020

September 2, 2020

To the Portland Planning Board:

The following four measures would help assure thoroughness of the Planning Board's examination of the proposed warehouse at 40 West Commercial Street before voting on its conditional-use application.

1. To assist in assessing demand for on-site storage of waterborne cargo at the International Marine Terminal, request that the Planning Department obtain from the applicant:
2018, 2019 and 2020 pallet volume for all Maine consignees and consignors of refrigerated containers. (This information is not confidential or proprietary.)

2. Request that the Planning Department obtain from the applicant:
The names of Maine importers and exporters, if any, that have stated their intentions to lease cold-storage space, together with the estimated pallet-position volume for each of these potential customers who ship refrigerated containers through the Portland port.

3. Request that the Planning Department obtain from the applicant:
An independent analysis of truck, rail and vessel transportation volume within the IMT with the inclusion of the proposed warehouse, conducted by a firm agreed to by the City and the West End Neighborhood Association. This analysis would assist the Planning Board in determining if non-maritime truck traffic would disallow the IMT from being permitted as an intermodal transportation facility, thus making the warehouse a truck terminal according to the city's Land Use Code (i.e., "A facility primarily for handling and storage of goods transported by tractor trailers..." Sec. 14-47).

(Truck terminals are prohibited in the Waterfront Port Development Zone, except within permitted intermodal transportation facilities, which must be "principally for vessels with regularly scheduled destination service or for railroad transportation service" [Sec. 14-319]. The IMT would not meet that zoning requirement if non-maritime truck traffic generated by the proposed warehouse caused tractor trailers to be the principal mode of transportation within the marine terminal.)

4. Obtain a legal opinion of Planning Board options if the warehouse meets the definitions of both truck terminal, a prohibited use, and cold-storage facility, a conditional use.

Sincerely,
Mark McCain
45 Summer Street
Portland, Maine 04102

Cold Storage 09/3/20

September 3, 2020

To: Chairman Mazer and Members of the Portland Planning Board

From: Carl Cramer
225 York Street, Unit 2
Portland, ME 04102
207-664-9337

re: Cold Storage at 40 West Commercial Street

I'd like to request that you consider the above application as an exceptional one.

Why exceptional?

It is an extreme version of a single-use structure, and one based on aggressive financial growth. This is not an apartment building, where the financial failure of the originator can be improved by a second apartment-developer.

If this is passed by the board, you will be giving your endorsement for a very large, ungainly building that can only be used for cold storage.

What if they fail to meet their projections?

What entity is liable to step in and resume operation of a failed enterprise? Certainly not another operator of a cold storage facility.

What then? A hotel?

An office building?

Condos or apartments?

None of these meet existing zoning requirements.

Thus, I hope you agree with me that this is an exceptional case, and you will treat it treat it accordingly.

Thank you for your consideration, Carl

Google Groups

Cold storage traffic study

Sonia Robertson <robertsonsonia336@gmail.com> Sep 8, 2020 2:40 PM
Posted in group: **Planning Board**

Hi. Has a comprehensive traffic study been done from franklin street to veterans bridge? The piece meal studies do not illuminate or address the whole problem. Seems cold storage study needs to include combined impact of veterans clinic, yacht services, Hobsons wharf as well as existing hotel plus the two new ones under construction.
Best, Sonia Robertson
Sent from my iPhone

Google Groups

PLEASE DON'T BUILD

LOUISE DAVIS <lld41@aol.com> Sep 8, 2020 6:34 PM
Posted in group: **Planning Board**

What is proposed is WAY, WAY TOO BIG! And unnecessary, besides. And has almost nothing to do with our fishing business. And, with all those huge trucks, the traffic on Commercial St. will be absolutely impossible and the West End neighborhood will be RUINED with noise and traffic. Please, please don't do this. Please.

Louise Davis

LOUISE DAVIS
lld41@aol.com
Please use my new email from now on. It is lldavis370@gmail.com

Google Groups

proposed cold storage warehouse on West Commercial Stree

Mary McCann <drmmccann@gmail.com> Sep 8, 2020 4:25 PM
Posted in group: **Planning Board**

To: Members of the City of Portland Planning Board

I am writing to express my opposition to the proposal before you for a cold storage warehouse on West Commercial Street. I concur entirely with the concerns and objections so clearly laid before you in the letter submitted by Mark McCain and want to underscore what I see as public safety and health concerns posed by the considerable increase of tractor trailer traffic on a heavily trafficked, already congested east - west single lane .7 mile street that is a gateway to the Old Port and ferry terminals from 295. In addition the inesection from which the trucks would enter and exit the yard to the cold storage plan is directly across from the Commercial Street access to the South Portland Bridge. I am a psychologist and not a traffic engineer by training, but it seems patently obvious to me, as I think it would to anyone who travels Commercial Street, that this significantly increased tractor trailer traffic will deleteriously impact travel and safety of vehicular traffic, not to mention cyclists and walkers. I refer you to the recent long form investigative reporting in the Boston Globe called BLIND SPOT.

Respectfully submitted,
Mary McCann
49 Summer Street
Portland ME 04102

Google Groups

cold storage building

peter green <plgmaine@yahoo.com> Oct 7, 2020 1:43 PM
Posted in group: **Planning Board**

Planning Boaard,

I won't be able to see it from my house so it's not really in my backyard. However, if this gets approved and built, I certainly will see it a lot as I drive on Commercial St. as will thousands and tens of thousands of others. Looks are very important.

Should you approve it (and I hope you see fit NOT to as it's been shown that it can and should be built off the peninsular) I would hope you require as much vegetation (trees) as possible between the building and Commercial St. In addition, I would hope you would require that the all sides of the building be of good colors rather than an industrial grey or white or tan.

I understand to roof will be covered with solar panels. GOOD.

Consider painting the visible sides with murals reflecting the history of Portland.

In short, do as much as you can to make this building something good to look at, a positive contribution to visual Portland.

Peter Green
11 Summer St.
Portland

Google Groups

The Upcoming Planning Board Meeting on Cold Storage on Commercial Street

Susan Conley <sus.con@gmail.com> Oct 7, 2020 7:03 PM
Posted in group: **Planning Board**

Dear Planning Board,

I'm writing as a longtime resident of the West End who is greatly concerned about the potential traffic congestion ramifications of the Cold Storage facility on Commercial Street. Zoning exceptions aside for the extremely large size of the facility, the lack of a really thorough and innovative traffic plan for what is arguably already the most congested street in Maine during many months of the year, is deeply worrisome for me.

Commercial Street is a central artery in and out of the city, and it is ostensibly the front door of our city: many many unhappy tourists and workers alike enter and leave Portland on Commercial Street, in what is often stop and go, bumper to bumper traffic. To put an extraordinary amount of additional trucking traffic (for product that is actually unrelated to maritime cargo) and employee traffic makes no sense to me without modifications to other traffic patterns on and off Commercial Street.

The traffic problem on Commercial Street is only going to get exponentially worse with the Cold Storage facility unless there is really prudent and thorough planning, until it finally becomes an unpassable road. I strongly urge you to slow down the approval of the Cold Storage facility until there is some traffic solution in hand.

Sincerely,

Susan Conley

Google Groups

Proposed Cold Storage Facility

Anne Pringle <oldmayor@maine.rr.com> Oct 7, 2020 4:08 PM
Posted in group: **Planning and Urban Development**

Chair Mazer and Members of the Planning Board,

I have been following the progress of this proposed project through the site plan review process and have reviewed the applicant's submission and public comments. I listened to both of your Zoom workshops, including that on September 8.

This is a very large proposed structure and many have spoken to the scale and impact, including members of the Board. Here's a creative idea to address the concerns raised:

~~In response to comments made by City staff and the public, the applicant has eliminated the roadway to the rear of the building. This reduces impervious surface and provides opportunity for screening from the South Portland side.

~~It also preserves space for potential future expansion of the cold storage facility, if warranted to serve port needs.

~~But **"what if"** the potential expansion were provided for in the front of the building instead of the rear? The whole building could be located further away from West Commercial Street, reducing its visual impact, and moved closer to the water, with room left available for some appropriate landscape buffer on the water. The building program could be flipped, with storage at the front (to be expanded on the front later if warranted) and the office and other space would be located in the rear, on the water side.

~~Until expansion is needed, if ever, the long wall and massing along West Commercial Street could be buffered with significant plantings and perhaps a creative mural.

Worth considering?...

Anne Pringle

Neal Street

Google Groups

Cold Storage proposal

Ash Salisbury <ashleysalisbury@gmail.com> Oct 7, 2020 8:01 AM
Posted in group: **Planning Board**

Dear Members of the Planning Board,

Thank you for your time and service helping steward our city toward the brightest possible future. The current cold storage proposal does not seem to meet your standards of promoting long term prosperity for Portland and its citizens, and at a minimum requires further information.

Because the impact on traffic and cargo/truck movement is core to this project AND occurs at what is already a bottleneck for the city, information about the volume of maritime cargo and to truck volume is key to making a planning decision. This decision should not be made until Corporation Counsel furnishes the information as governed by the Waterfront Port Development Zone.

Because this project will have such an enormous impact on traffic in and out of the city, and on noise and livability for the West End, please ensure due process by holding a remote (zoom) neighborhood meeting before any votes are taken.

Please consider the following concerns:
1. Cars have already been cutting through neighborhood streets to avoid Commercial Street and creating safety hazards. The intersection of Brackett and York near the playground and park has cars and trucks tearing through the stop sign all day long. Our corner has been requesting safety measures be improved for years--there is a CHILDREN'S ART SCHOOL on that corner and there have been several near-misses from trucks and cars trying to avoid congestion on Commercial. Before adding to the traffic burden of an already overburdened artery, please carefully weigh how much more dangerous this will make the neighborhood and whether the imagined benefit of this facility is really worth it.

2. Many of the products trucked in and out will be unrelated to maritime cargo and could therefore be better stored off the waterfront. The waterfront is our city's collective treasure and should be reserved for what MUST be there.

3. Similarly, riverfront land is not necessary for "possible future expansion." Waterfront property is too precious to give away for non-specific plans that don't meet the city's criteria of civic return on civic investment. At a minimum, the warehouse should be moved back from Commercial Street so that it is less of a soulless monolith. Trees and other landscaping features could help minimize the impact of replacing water views with a white box.

Sincerely,
Ashley Salisbury
26 Brackett Street
Portland ME 04102

Google Groups

Public comment

walworth <walworthmccain@maine.rr.com> Oct 9, 2020 9:07 AM
Posted in group: **Planning Board**

Hi Jennifer,
I have attached a one-page pdf file as Planning Board public comment concerning the cold-storage proposal for 40 West Commercial Street.
Best wishes,
Mark McCain
45 Summer Street
Portland

Bridgeport Associates 555 Commercial Street Portland, ME. 04101
207.774.6324

10/09/2020

Dear Chairman Mazer & Planning Board members,

First I would like to say that I have no objection to the development of a cold Storage facility in the Greater Portland area if it is built with proper foresight as to best use of limited waterfront land and with Private investment since I believe that any profit derived from such an endeavor will go into the "owners" pockets, and not the taxpayers who will help finance this project. I think the taxpayers also need to be told who will be liable for this project if it does not cash flow as planned? Remember the Cate St. "investment" and more recently the waste to energy plant in the Bangor area.

I have attached a second opinion on the amount of primarily Tractor trailer necessary to support a freezer facility of this size. It seems that the analysis by Sewall used a faulty Land use code # 150 which is used to determine traffic for low warehouse storage facilities versus the Land Use code 157 which should be used for a high cube warehouse and the difference in truck traffic is tremendous as you can see—The Sewell "estimate" of 70 trucks per day versus the "estimate" of as many as 250 daily trips--- I am no expert on truck traffic to & from warehouses, but I do believe this new information should be addressed by Sewall and probably a second unaffiliated company who specializes in this work.

The only other question I have concerning traffic is; has anyone plugged in the additional traffic that soon will be on West Commercial St. from the new Veteran's Care building into any of these equations?

Other tax payer investments by Maine DOT have made poor use of tax payer dollars by my and many other's peoples estimates—I say estimates because to my knowledge the Tax payer does not get transparency when it comes to the use of both State of Maine bond raises and corresponding Federal matching tax dollars. Let's keep in mind that a few people make money on these transactions and a few jobs are created but ALL taxpayers contribute to the payment of both state & Federal tax dollars used on these "investments"

I would like to say again that I am for a Cold Storage in the greater Portland area if it is feasible enough for Private industry to invest corporate dollars not Taxpayer dollars.

Regards,

Angelo Ciocca
Bridgeport Associates

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, ME

PROJECT NO. 0232277.00

JULY 2020

ISSUED FOR BID - NOT FOR CONSTRUCTION

SHEET INDEX	
NUMBER	SHEET TITLE
GENERAL	
G-000	COVER
G-001	GENERAL NOTES, LEGEND, SHEET INDEX & ABBREVIATIONS
CIVIL	
C-001	DEMOLITION PLAN
C-100	SITE PLAN
C-101	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C-102	UTILITY PLAN
C-200	CIVIL DETAILS – 1
C-201	CIVIL DETAILS – 2
C-202	CIVIL DETAILS – 3
C-203	CIVIL DETAILS – 4
C-204	CIVIL DETAILS – 5
C-205	CIVIL DETAILS – 6
LANDSCAPE	
L-1.0	LANDSCAPING PLAN
ELECTRICAL	
E00.01	ELECTRICAL LEGEND
E05.01	ELECTRICAL SITE PLAN
E05.02	ELECTRICAL SITE GROUNDING PLAN
E10.01	ONE-LINE DIAGRAMS SHEET 1
E10.02	ONE-LINE DIAGRAMS SHEET 2
E20.01	LIGHTING PLAN – OVERALL
E20.02	LIGHTING PLAN – COLD STORAGE LOWER LEVEL
E20.03	LIGHTING PLAN – COLD STORAGE UPPER LEVEL
E20.04	LIGHTING PLAN – ADMIN, MAINTENANCE & DOCK SUPPORT/OFFICES
E20.05	LIGHTING PLAN – TRUCK BAY, MECHANICAL ROOM & MAIN ELECTRICAL ROOM
E30.01	POWER PLAN – OVERALL
E30.02	POWER PLAN – COLD STORAGE
E30.03	POWER PLAN – ADMIN, MAINTENANCE & DOCK SUPPORT/OFFICES
E30.04	POWER PLANS – TRUCK BAY, MECHANICAL ROOM AND MAIN ELECTRICAL ROOM
E30.05	ROOF POWER PLAN
E60.01	LIGHT FIXTURE & LIGHTING CONTROL SCHEDULES
E60.02	PANEL SCHEDULES
E60.03	PANEL SCHEDULES
E80.01	ELECTRICAL DETAILS SHEET 1
E80.02	ELECTRICAL DETAILS SHEET 2
SITE LIGHTING	
SL-100	SITE LIGHTING PLAN



PROJECT LOCATION MAP

50 0 50 100
scale mile



SOURCE: USGS TOPOGRAPHIC MAP

SITE LOCATION MAP

1/2 0 1/2 1
scale mile

2000 0 2000 4000
scale feet

WOODARD & CURRAN

41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

G-000

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Drawings\General\0232277.00 G000.dwg, Jul 31, 2020 - 10:11am PITELLMORE

GENERAL NOTES:

1. EXISTING CONDITIONS, TOPOGRAPHIC INFORMATION, UTILITY LOCATIONS & PROPERTY LINE INFORMATION SHOWN HEREON HAVE BEEN PROVIDED BY OWEN HASKELL, INC.
2. ELEVATIONS REFERENCED TO VERTICAL DATUM: VERTICAL DATUM IS NGVD 1929 BASED UPON MAINE DEPARTMENT OF TRANSPORTATION DISK L 5 (NGS) RESET 1997 FOUND SET IN CONCRETE BRIDGE ABUTMENT THAT SUPPORTS THE BEACH STREET ON RAMP WHERE IT CONNECTS TO THE CASCO BAY BRIDGE.
3. ELEVATIONS REFERENCED TO HORIZONTAL DATUM: MAINE STATE PLANE WEST COORDINATES NAD 83 MAINE WEST.
4. THE ENTIRE SITE SHALL BE DEVELOPED AND/OR MAINTAINED AS DEPICTED ON THE SITE PLAN. APPROVAL OF THE PLANNING AUTHORITY OR PLANNING BOARD SHALL BE REQUIRED FOR ANY ALTERATION TO OR DEVIATION FROM THE APPROVED SITE PLAN, INCLUDING, WITHOUT LIMITATION: TOPOGRAPHY, DRAINAGE, LANDSCAPING, RETENTION OF WOODED OR LAWN AREAS, ACCESS, SIZE, LOCATION, AND SURFACING OF PARKING AREAS, AND LOCATION AND SIZE OF BUILDINGS.
5. THE CONTRACTOR SHALL CALL "DIG SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO EXCAVATION IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL SAFETY CODES.
6. PROTECT AND DO NOT DISTURB PROPERTY IRONS AND MONUMENTS. IF DISTURBED, THE PROPERTY MONUMENT SHALL BE RESET AT THE CONTRACTOR'S EXPENSE BY A LAND SURVEYOR LICENSED IN THE STATE OF MAINE. PROPERTY MONUMENTS SHALL BE RESET IN ACCORDANCE WITH CITY OF PORTLAND STANDARDS.
7. DO NOT PARK, IMPEDE ACCESS TO, OR STORE EQUIPMENT ON ADJACENT CITY OR PRIVATELY OWNED LOTS, UNLESS PERMISSION HAS BEEN GRANTED IN WRITING BY CITY AND/OR LAND OWNER.
8. FINAL SETS OF AS-BUILT PLANS SHALL BE SUBMITTED DIGITALLY TO THE PLANNING AND URBAN DEVELOPMENT DEPARTMENT ON A CD OR DVD IN AUTOCAD FORMAT (*DWG) RELEASE AUTOCAD 2005 OR GREATER, AS SPECIFIED IN THE CITY OF PORTLAND TECHNICAL MANUAL.
9. PRIOR TO CONSTRUCTION, A PRECONSTRUCTION MEETING SHALL BE HELD AT THE PROJECT SITE WITH THE CONTRACTOR, ENGINEER, CITY OF PORTLAND DEVELOPMENT REVIEW COORDINATOR, CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS REPRESENTATIVE, AND OWNER TO REVIEW THE CONSTRUCTION SCHEDULE AND CRITICAL ASPECTS OF THE SITE WORK. AT THAT TIME, THE SITE/BUILDING CONTRACTOR SHALL PROVIDE THREE (3) COPIES OF A DETAILED CONSTRUCTION SCHEDULE TO THE ATTENDING CITY REPRESENTATIVE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE A MUTUALLY AGREEABLE TIME FOR THE PRECONSTRUCTION MEETING.
10. CONTRACTOR IS RESPONSIBLE FOR ALL SNOW REMOVAL AND WINTER MAINTENANCE OF ACCESS PATHS WITHIN THE LIMIT OF WORK.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE SITE DRAWINGS, INCLUDING BUT NOT LIMITED TO ALL UTILITIES, STORM INFRASTRUCTURE, SIGNS, UTILITY POLES, FENCES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH THE GOVERNING AUTHORITY'S SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COSTS SHALL BE INCURRED BY THE CONTRACTOR.
12. LAND OUTSIDE THE PROPOSED LIMIT OF WORK SHALL NOT BE DISTURBED BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.
14. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY CODES, REGULATIONS, LEGAL REQUIREMENTS, PERMIT CONDITIONS, ETC.
15. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKWAYS, STREETS, PAVEMENTS, CURBING, TREES, PLANTINGS, LAWN, FENCING TO REMAIN ON OR OFF THE PREMISES, AND SHALL REPAIR AND REPLACE AT HIS/HER OWN EXPENSE, AS DIRECTED BY THE ENGINEER, ANY ITEMS DAMAGED AS A RESULT OF THE CONTRACTOR'S WORK.
16. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING AND SHORING OF ALL EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF ALL GOVERNING CODES AND REGULATIONS.
17. SAWCUTS IN EXISTING PAVEMENT SHALL BE SMOOTH AND STRAIGHT. EXISTING PAVEMENT SHALL BE SAWCUT AND GRINDED PER THE PAVEMENT BUTT JOINT DETAIL. NO FEATHERING OF PAVEMENT WILL BE PERMITTED.
18. WORK WITHIN PUBLIC RIGHT-OF-WAY SHALL COMPLY WITH APPLICABLE CITY OF PORTLAND AND STATE REQUIREMENTS.
19. IF IMPORTED FILL MATERIAL IS REQUIRED, IT SHALL BE CERTIFIED IN WRITING BY LICENSED GEOLOGIST OR ENGINEER AS NON-CONTAMINATED, CLEAN FILL SUITABLE FOR THE INTENDED USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTING AS OUTLINED IN THE PROJECT SPECIFICATIONS.
20. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL FINISH (GRAVEL, PAVEMENT, RIPRAP, GRASS, ETC.) UNLESS OTHERWISE NOTED ON PLANS. RESTORATION OF ALL AREAS DAMAGED BY CONTRACTOR SHALL BE INCIDENTAL TO THE PROJECT.
21. ALL CURB DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AND SHALL CONFORM TO CITY OF PORTLAND SPECIFICATIONS. COST IS INCIDENTAL TO CONTRACT.
22. ALL MATERIAL SHALL BE FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.
23. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS PRIOR TO START OF CONSTRUCTION.
24. ALL FULL DEPTH PAVEMENT REPLACEMENT WITHIN PUBLIC RIGHT-OF-WAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF PORTLAND TECHNICAL STANDARDS.
25. ALL WORK WITHIN THE RIGHT OF WAY OF CITY STREETS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY TRAFFIC ENGINEER. THE CONTRACTOR SHALL SUBMIT PROPOSED TRAFFIC CONTROL PLANS TO THE TRAFFIC ENGINEER AT LEAST 7 DAYS BEFORE BEGINNING CONSTRUCTION IN ANY STREET. THE PROPOSED TRAFFIC CONTROL PLAN SHALL BE SUBJECT TO APPROVAL BY THE TRAFFIC ENGINEER, WHO MAY ATTACH SPECIAL CONDITIONS TO, OR REQUIRE MODIFICATIONS OF, THE TRAFFIC CONTROL PLAN. WORK SHALL NOT BEGIN UNTIL THE PLAN IS APPROVED BY THE TRAFFIC ENGINEER.
26. RESTRICT ACCESS TO SITE THROUGH THE USE OF APPROPRIATE SIGNAGE, BARRIERS, FENCES, ETC. SITE SHALL BE LEFT WITH APPROPRIATE SAFETY MEASURES IN PLACE DURING NON-WORKING HOURS. NO TRENCH SHALL BE LEFT OPEN DURING NON-WORKING HOURS. SITE SAFETY IS THE RESPONSIBILITY OF CONTRACTOR, DURING BOTH WORKING AND NON-WORKING HOURS.
27. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY CONSTRUCTION PERMITS. PERMIT APPLICATIONS SHALL BE SUBMITTED WITH ADEQUATE TIME SO AS NOT TO DELAY CONSTRUCTION.
28. THE CONTRACTOR SHALL OBTAIN A CITY STREET OPENING PERMIT BEFORE BEGINNING CONSTRUCTION. THE CONTRACTOR WILL ALSO BE REQUIRED TO HAVE A CURRENT EXCAVATOR'S LICENSE IN THE CITY.
29. ALL WORK IN THE PUBLIC R.O.W. SHALL BE COMPLETED IN ACCORDANCE WITH ARTICLES VI, VII, AND IX OF CHAPTER 25-STREETS, SIDEWALKS, AND OTHER PUBLIC PLACES OF THE CITY OF PORTLAND CODE OF ORDINANCES.
30. ALL SEWER CONSTRUCTION IN THE PUBLIC WAY SHALL BE COMPLETED IN ACCORDANCE WITH ARTICLE II OF CHAPTER 24-SEWERS OF THE CITY OF PORTLAND CODE OF ORDINANCES.
31. CONTACT CITY OF PORTLAND ARBORIST AND ENGINEER PRIOR TO CUTTING ROOTS, TRIMMING BRANCHES, OR DISTURBING TREES WITHIN THE R.O.W. THAT NOT HAVE BEEN NOTED FOR REMOVAL ON THE PLANS.
32. CONTRACTOR SHALL PROVIDE AND MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES IN ACCORDANCE WITH THESE PLANS AND THE LATEST EDITION OF THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S BEST MANAGEMENT PRACTICES MANUAL. KEEP ALL STREETS FREE OF DUST, MUD, AND DEBRIS. STREETS AND WALKWAYS SHALL BE SWEPT REGULARLY, AND TEMPORARY CONSTRUCTION ENTRANCES SHALL BE UTILIZED DURING CONSTRUCTION.
33. CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN ACCORDANCE WITH REQUIREMENTS OUTLINED WITHIN THE MAINE CONSTRUCTION GENERAL PERMIT. THE ENGINEER WILL SUBMIT THE "NOTICE OF INTENT TO COMPLY WITH THE MAINE GENERAL CONSTRUCTION PERMIT". CONTRACTOR SHALL FILE A NOTICE OF TERMINATION WITH PHOTOGRAPHS AND REQUIRED ATTACHMENTS TO THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION UPON COMPLETION OF THE PROJECT. CONTRACTOR SHALL SUBMIT A DRAFT OF THE NOTICE TO THE OWNER AND THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO SUBMISSION. A COPY OF THE NOTICE CAN BE OBTAINED AT WWW.MAINE.GOV/DEP/LAND/STORMWATER/CONSTRUCTION.HTML.
34. CONTRACTOR SHALL MAINTAIN EROSION CONTROL AND STORMWATER POLLUTION PREVENTION SYSTEMS IN COMPLIANCE WITH THE REQUIREMENTS OF THE MAINE CONSTRUCTION GENERAL PERMIT (MCGP). CONTRACTOR SHALL CONDUCT AND MAINTAIN RECORDS OF EROSION CONTROL INSPECTIONS PER THE NOTICE OF INTENT TO COMPLY WITH THE MAINE CONSTRUCTION GENERAL PERMIT.

GRADING AND DRAINAGE NOTES:

1. CASTINGS FOR EXISTING STRUCTURES TO REMAIN AND PROPOSED STRUCTURES SHALL BE SET TO THE PROPOSED ELEVATIONS SHOWN ON THE DRAWINGS.
2. UNSUITABLE FILL AND BACKFILL MATERIALS ARE MATERIALS CONTAINING EXCESSIVE AMOUNT OF WATER, PLASTIC, CLAY, VEGETATION, ORGANIC MATTER, DEBRIS, PAVEMENT, STONES OR BOULDERS OVER 6 INCHES IN GREATEST DIMENSION, FROZEN MATERIAL, AND MATERIAL WHICH, IN THE OPINION OF THE ENGINEER, WILL NOT PROVIDE A SUITABLE FOUNDATION OR SUBGRADE.
3. SUITABLE SOIL SHALL BE PLACED IN LAYERS TO THE REQUIRED ELEVATIONS AS SHOWN ON THE DRAWINGS. FILL, BACKFILL AND COMPACT TO PRODUCE MINIMUM SUBSEQUENT SETTLEMENT OF THE MATERIAL AND PROVIDE ADEQUATE SUPPORT FOR THE SURFACE TREATMENT OR STRUCTURE TO BE PLACED ON THE MATERIAL. PLACE MATERIAL IN APPROXIMATELY HORIZONTAL LAYERS OF BEGINNING AT LOWEST AREA TO BE FILLED. DO NOT IMPAIR DRAINAGE. DO NOT USE ON-SITE TOPSOIL AS FILL MATERIAL.
4. FOR GROUND SURFACE PREPARATION, CONTRACTOR SHALL REMOVE VEGETATION, DEBRIS, UNSUITABLE SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO PLACEMENT OF FILL. REMOVE MATERIAL TO THE FULL EXTENT OF ROOT PENETRATION. PROOF-ROLL EXISTING GROUND SURFACE PRIOR TO PLACEMENT OF FILL TO PROVIDE A DENSE, STABLE BASE FOR THE FIRST LIFTS OF THE STRUCTURAL FILL.

UTILITIES NOTES:

1. ALL PROPOSED UTILITIES (WATER, ELECTRIC, SANITARY, STORM SEWER, ETC.) AND THEIR CONNECTIONS, DISCONNECTION AND RELOCATION OF EXISTING UTILITIES SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY HAVING JURISDICTION. ANY COORDINATION WITH THE MUNICIPALITY AND/OR UTILITY COMPANY, PERMITS OR APPROVALS REQUIRED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. CONDUIT FOR ELECTRIC LINES SHALL BE WATER-TIGHT IN ADDITION TO CONFORMING TO UTILITY COMPANY REQUIREMENTS.
3. REFER TO ELECTRICAL DRAWINGS PREPARED BY WOODARD & CURRAN FOR SITE ELECTRICAL AND BARTLETT DESIGN FOR SITE LIGHTING, INCLUDING WIRING DIAGRAMS, SCHEDULES, CONDUIT MATERIAL, POWER CONNECTIONS AND ENERGIZATION AND ALL OTHER APPURTENANCES RELATED TO ELECTRICAL WORK FOR THIS PROJECT.
4. ALL PROPOSED ELECTRICAL AND LIGHTING WORK SHOWN ON THESE CIVIL DRAWINGS SHALL BE COORDINATED WITH THE ELECTRICAL PLANS AND SPECIFICATIONS. IN THE EVENT THERE IS A DISCREPANCY BETWEEN THE CIVIL AND ELECTRICAL DRAWINGS, THE ENGINEER SHALL BE NOTIFIED IN WRITING.
5. CLEAN AND/OR FLUSH ALL MANHOLES, CATCH BASINS, AND ASSOCIATED PIPING AFTER THE WORK HAS BEEN COMPLETED.
6. COORDINATE CONSTRUCTION ACTIVITY WITH UTILITY COMPANIES, EMERGENCY SERVICES AND CITY. NOTIFY UTILITY COMPANIES A MINIMUM OF 48 HOURS BEFORE DOING WORK ACTIVITIES ADJACENT TO THOSE UTILITIES.
7. COORDINATE DISRUPTION OF PRIVATE UTILITY SERVICES WITH LANDOWNERS AT LEAST TWO DAYS (48 HOURS) PRIOR TO DISRUPTION. ALL UTILITY COORDINATION IS RESPONSIBILITY OF CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UTILITY CONNECTION, RETIREMENT, AND COORDINATION FEES.
8. CONTRACTOR SHALL ARRANGE AND PREPARE FOR ALL NECESSARY TEMPORARY UTILITIES AS REQUIRED TO COMPLETE WORK, INCLUDING ANY NECESSARY SUB-METERING OR TEMPORARY CONNECTIONS.
9. ALL WATER LINE (MAINS, SERVICES, HYDRANTS, ETC.) CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE PORTLAND WATER DISTRICT TECHNICAL SPECIFICATIONS, LATEST EDITION. PORTLAND WATER DISTRICT TECHNICAL SPECIFICATIONS SHALL GOVERN IN THE CASE OF ANY AND ALL CONFLICTS IN THE PROJECT CONSTRUCTION DOCUMENTS AT NO ADDITIONAL COST TO OWNER.
10. ALL GAS LINE (MAINS, SERVICES, GATE VALVES, METERS, ETC.) CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH UNITIL'S TECHNICAL SPECIFICATIONS, LATEST EDITION. UNITIL'S TECHNICAL SPECIFICATIONS SHALL GOVERN IN THE CASE OF ANY AND ALL CONFLICTS IN THE PROJECT CONSTRUCTION DOCUMENTS AT NO ADDITIONAL COST TO OWNER.
11. EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM A FIELD SURVEY PREPARED BY OWEN HASKELL, INC. THESE PLANS DO NOT NECESSARILY DEPICT THE EXACT LOCATIONS OF ALL UTILITIES, WHICH MAY EXIST AT THIS TIME WITHIN THE SURVEY LIMITS. THERE MAY BE EXISTING LINES OTHER THAN THOSE INDICATED. THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE CONSIDERED APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY UTILITY CONNECTIONS OR CROSSINGS OF PROPOSED OR EXISTING UTILITIES. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER IN WRITING. THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES RELATIVE TO THE LOCATIONS AND ELEVATIONS OF THESE LINES. NO SEPARATE OR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR DUE TO ANY VARIANCE BETWEEN THE DATA SHOWN ON THE PLANS AND ACTUAL FIELD CONDITIONS ENCOUNTERED. THE CONTRACTOR IS RESPONSIBLE FOR HIS/HER OWN DETERMINATION AS TO THE TYPE AND LOCATION OF THE EXISTING UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE AND TO FACILITATE THE PROPOSED CONNECTION(S).
12. WHEREVER POSSIBLE, PROVIDE 10 FOOT HORIZONTAL SEPARATION BETWEEN WATER AND SEWER LINES. WHEN THIS HORIZONTAL SEPARATION IS NOT POSSIBLE, INSTALL SEWER LINE BELOW THE WATER LINE WITH AT LEAST 18 INCHES BETWEEN BOTTOM OF WATER LINE AND TOP OF SEWER.
13. FOR SEWER LINE CROSSING WATER LINE TRENCHES, PROVIDE AT LEAST 18 INCHES BETWEEN BOTTOM OF WATER LINE AND TOP OF SEWER.
14. INSULATE ALL SEWER AND FORCEMAINS WHICH HAVE LESS THAN 4 FEET OF COVER, AND ALL WATER MAINS THAT HAVE LESS THAN 5'-6" OF COVER, OR WHERE DIRECTED BY THE ENGINEER. RIGID INSULATION REQUIRED: 2" THICK, BY 4' WIDE, UNLESS OTHERWISE NOTED. COSTS ASSOCIATED WITH INSULATION ARE INCIDENTAL TO CONTRACT.
15. INSTALL THRUST BLOCKS AT ALL BENDS IN FORCEMAIN AND WATER MAIN. SEE CIVIL DETAIL ON SHEET C-201.
16. PROVIDE END CAPS ON ALL UNDERDRAIN PIPING EXCEPT WHERE DAYLIGHTED, UNLESS OTHERWISE NOTED.
17. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL DIG TEST PITS TO VERIFY THE LOCATION OF POTENTIAL EXISTING UNDERGROUND UTILITY CONFLICTS. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AT PROPOSED CONNECTIONS AND UTILITY CROSSINGS, AND ADVISE THE ENGINEER IN WRITING OF ANY DISCREPANCIES.

DEMOLITION NOTES:

1. PRIOR TO THE START OF DEMOLITION, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND/OR APPROVALS FROM THE CITY OF PORTLAND, AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
2. THE WORD 'DEMOLISH' SHALL IMPLY THE FULL REMOVAL AND PROPER DISPOSAL OF THE ITEM AND ANY APPURTENANT ITEMS, AS NOTED, OR AS DIRECTED BY THE OWNER OR THEIR REPRESENTATIVE. THE OWNER RETAINS THE RIGHT TO KEEP ANY ITEM NOTED FOR REMOVAL OR DEMOLITION AT THE REQUEST OF THE OWNER OR THEIR REPRESENTATIVE.
3. CONSTRUCTION/DEMOLITION DEBRIS NOT APPROVED FOR REUSE ON-SITE, SHALL BE REMOVED AND DISPOSED OFF SITE IN ACCORDANCE WITH THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION. WASTE MANIFEST FORMS DOCUMENTING PROPER OFF-SITE DISPOSAL SHALL BE PROVIDED TO THE SITE/CIVIL ENGINEER AND THE OWNER.
4. PRIOR TO THE START OF DEMOLITION, THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES TO BE DEMOLISHED OR TO REMAIN PROTECTED DURING CONSTRUCTION. IF ANY DISCREPANCIES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF THE CONFLICT.
5. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES TO REMAIN. ANY TEMPORARY SHUT DOWNS REQUIRED TO FACILITATE THE PROPOSED CONSTRUCTION, WHICH MAY AFFECT USES ON ADJACENT PROPERTIES SHALL BE COORDINATED BY THE CONTRACTOR, THE CITY OF PORTLAND AND APPLICABLE UTILITY.
6. CONTRACTOR SHALL REPAIR OR REPLACE ANY STRUCTURES OR UTILITIES DAMAGED DURING CONSTRUCTION; THE CONTRACTOR SHALL PROCEED WITH CAUTION WITHIN THE PROPOSED WORK AREA TO PREVENT ANY INTERRUPTION TO EXISTING UTILITY SERVICE.
7. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE A MAINTENANCE AND PROTECTION OF TRAFFIC (MPT) PLAN IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS.
8. CONTRACTOR SHALL COVER CONSTRUCTION DUMPSTERS AND ROLL-OFF CONTAINERS, AND STORE ALL CONSTRUCTION CHEMICALS INSIDE THE CONSTRUCTION TRAILER OR UNDER A COVERED AREA DURING PERIODS WHEN CONSTRUCTION CEASES.

LAYOUT AND MATERIALS NOTES:

1. ALL DIMENSIONS AND RADII ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.

ABBREVIATIONS

&	AND	N.I.C.	NOT IN CONTRACT
A.G.	ABOVE GROUND	NO.	NUMBER
		NR	NO REFUSAL
BC	BOTTOM OF CURB	N.T.S.	NOT TO SCALE
BIT	BITUMINOUS		
BW	BOTTOM OF WALL	O.C.	ON CENTER
B/W	BETWEEN	OE	OVERHEAD ELECTRIC
		OH	OVERHEAD
CB	CATCH BASIN		
CI	CAST IRON	±	PLUS OR MINUS
CMP	CENTRAL MAINE POWER	LLS	LICENSED LAND SURVEYOR
CMP	CORRUGATED METAL PIPE	PROP.	PROPOSED
CONC	CONCRETE	PT.	POINT
		PVC	POLYVINYL CHLORIDE
DI	DUCTILE IRON		
DIA.	DIAMETER	R.O.W.	RIGHT-OF-WAY
DMH	DRAIN MANHOLE	RCP	REINFORCED CONCRETE PIPE
DTL.	DETAIL	REINF.	REINFORCED
		REQ'D	REQUIRED
E	UNDERGROUND ELECTRICAL		
EL.	ELEVATION	S	SLOPE (FT./FT.)
E.O.P.	EDGE OF PAVEMENT	S	SEWER
EXIST.	EXISTING	SD	STORM DRAIN
		SMH	SEWER MANHOLE
FF	FINISH FLOOR	SCH	SCHEDULE
FM	FORCEMAIN	STA.	STATION
FT	FOOT/FEET		
		TS	TOP OF STAIRS
G	GAS MAIN	TW	TOP OF WALL
GS	GAS SERVICE	TYP.	TYPICAL
GALV.	GALVANIZED		
GRAN.	GRANITE	UP	UTILITY POLE
HDPE	HIGH DENSITY POLYETHYLENE	VC	VITRIFIED CLAY
HYD	HYDRANT	VIT.	VITRIFIED CLAY
INV.	INVERT	W	WEST
		W	WATER
LF	LINEAR FEET	W/	WITH
		W	WATERMAIN
MAX.	MAXIMUM	WS	WATER SERVICE
MDOT	MAINE DEPARTMENT OF TRANSPORTATION	WV	WATER VALVE
MIN.	MINIMUM		
MON	MONUMENT		

LEGEND

EXISTING		PROPOSED
	CONTOUR (1' OR 2' INTERVAL)	
	CONTOUR (INDEX)	
S	SANITARY SEWER	S
FM	FORCEMAIN	FM
SD	STORM DRAIN	SD
UD	UNDERDRAIN	UD
W	WATER LINE	W
E	UNDERGROUND ELECTRIC	E
T	UNDERGROUND TELEPHONE	T
CTV	UNDERGROUND TELEVISION	CTV
G	GAS LINE	G
OE	OVERHEAD ELECTRIC	OE
AS	ABANDONED SEWER	
AW	ABANDONED WATER LINE	
	PROPERTY LINE	-P-
	RIGHT OF WAY	R/W
	EASEMENT	
	EDGE OF VEGETATION	
X X X	FENCE	
	CENTERLINE	
	RETAINING WALL	
	STONEWALL	
	CURB	
	EDGE OF PAVEMENT	
	EDGE OF GRAVEL	
	GUARDRAIL	
	RAILROAD TRACKS	
	SILT FENCE	
	LIMIT OF WORK	LW
	SAWCUT	
	STANDARD DUTY BITUMINOUS PAVEMENT	
	HEAVY DUTY BITUMINOUS PAVEMENT	
	CONCRETE WALKWAY	
	RIPRAP	
	SNOW STORAGE	
	LAWN	
	SOD	

LEGEND

EXISTING		PROPOSED
	SANITARY SEWER MANHOLE	S
CO	CLEAN OUT	CO
	DRAINAGE MANHOLE	
	FIELD INLET CATCH BASIN	
	CURB INLET CATCH BASIN	
	CATCH BASIN INLET PROTECTION	
T	TELEPHONE MANHOLE	T
G	GAS METER	G
	GAS VENT	
	GAS GATE	
T	TRANSFORMER	T
	UTILITY POLE	
	UTILITY POLE WITH GUY	
	LIGHTPOST	
	LIGHT POLE	
	WATER GATE	
	CURB STOP	
	REDUCER	
	COUPLING	
	HYDRANT	
	THRUST BLOCK	
	GATE VALVE	
	PROPERTY MONUMENT	
	STREET AND MISCELLANEOUS SIGNS	
+ XX.XX	SPOT ELEVATION	+ XX.XX
	DECIDUOUS TREE/SHRUB	
	CONIFEROUS TREE/SHRUB	
TP-#	TEST PIT	TP-#
	ROOF DRAIN	RD
	AREA DRAIN	AD

ISSUED FOR BID - NOT FOR CONSTRUCTION

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STATE OF MAINE
DARRIN B. STAIRS
No. 15151
REGISTERED PROFESSIONAL ENGINEER

#	DESCRIPTION	DATE

PROTECT EXISTING SEWER MANHOLE
PROTECT EXISTING CATCH BASIN
PLUG 15" RCP STORMDRAIN
PROTECT EXISTING UTILITY INFRASTRUCTURE
APPROXIMATE LOCATION OF EXISTING GATE TO BE PRESERVED AND PROTECTED
CAP GAS LINE, COORDINATE WITH UNITIL
DEMOLISH EXISTING GAS VALVE
DEMOLISH EXISTING GAS LINE
REMOVE AND RESET FENCE, COORDINATE WITH MAINE INTERNATIONAL COLD STORAGE FACILITY
DEMOLISH EXISTING RAIL AND MISC. RAIL ITEMS WITHIN LIMITS OF WORK
PROTECT EXISTING UNDERGROUND ELECTRICAL CONDUIT
INSTALL CAP FOR UNDERGROUND ELECTRICAL SERVICE
DEMOLISH 85 LF OF RCP STORMDRAIN
DEMOLISH EXISTING STRUCTURE
DEMOLISH PAVEMENT TO LIMITS SHOWN
PROTECT EXISTING UNDERGROUND ELECTRICAL CONDUIT
DEMOLISH CONCRETE REMAINS
DEMOLISH EXISTING PAVEMENT
DEMOLISH UNDERGROUND ELECTRICAL AND TRANSFORMER PADS
PROTECT EXISTING FENCE
APPROXIMATE LIMIT OF EXISTING PAVEMENT, SEE NOTE 1
DEMOLISH EXISTING WATER MAIN
DEMOLISH EXISTING HYDRANT
DEMOLISH CONCRETE REMAINS
PROTECT SIGNS
EXISTING GAS LINES LOCATIONS ARE APPROXIMATE AND MUST BE VERIFIED BY CONTRACTOR.
DEMOLISH EXISTING GRAVEL AS NEEDED FOR CONSTRUCTION
DISCONNECT AND REMOVE EXISTING LIGHT POLE AND BOLLARDS AS SHOWN ON SITE LIGHTING PLAN
DEMOLISH EXISTING CONDUIT AND WIRING AS SHOWN ON SITE LIGHTING PLAN
PROTECT EXISTING FENCE
DISCONNECT AND REMOVE EXISTING LIGHT POLE AND BOLLARDS AS SHOWN ON SITE LIGHTING PLAN
75' SETBACK FROM MHW
25' SETBACK FROM MHW
MEAN HIGH WATER (MHW) = 4.952'
DISCONNECT AND REMOVE EXISTING LIGHT POLE AND BOLLARDS AS SHOWN ON SITE LIGHTING PLAN
REMOVE POST (TYP OF 3)
25' SETBACK FROM MHW
MEAN HIGH WATER (MHW) = 4.952'
DEMOLISH EXISTING PAVEMENT

BEACH ST.
PAVED – PUBLIC – VARIABLE WIDTH
LAND NOW OR FORMERLY OWNED BY NEW YARD, LLC 30887/247
STATE OF MAINE DEPARTMENT OF TRANSPORTATION 782,438± S.F. 17.9± ACRES
30' WIDE SEWER EASEMENT TO CITY OF PORTLAND 31021/187 31378/333
20' WIDE CMP EASEMENT
TRANS. ON CONC. PAD
ELEC. METER
CONC. PAD
GATE
CHAIN LINK FENCE
RAILROAD TRACKS
ELEC. BOX
CONC. POSTS
CONC.
PAVEMENT
GAS FACILITY
GAS WITNESS SIGNS
HIGHEST ANNUAL TIDE LINE ELEVATION 7.2 NGVD 1929
GRAVEL
RIP RAP
PIER
75' FROM H.A.T. SHORELAND ZONE
75' SETBACK
100 YEAR FLOOD LINE
FORMER HARBOR COMMISSIONERS LINE OF 1929
CONCRETE COVER (TO BE VERIFIED)
TBM BOLT ON TOP OF LIGHT POLE BASE ELEV.=18.10'
N:295843.13 E:2927103.20
N:295526.82 E:2927402.54
S70°47'58"W 381.52'
N16°58'37"W 149.35'
N73°01'23"E 1053.20'
S62°18'00"W 400'±
S78°39'00"W 117±'
N01°40'00"W 102'±
FLOW
EBB

NOTES:

1. LIMITS OF EXISTING PAVEMENT WERE APPROXIMATED FROM AERIAL IMAGERY.
2. DEMOLISH ALL EXISTING ELECTRICAL UTILITIES WITHIN THE LIMIT OF WORK EXCEPT WHERE NOTED.

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

ISSUED FOR BID - NOT FOR CONSTRUCTION

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
LICENSED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE	CHECKED BY: DS
			0232277.00 Dwg

REV	DESCRIPTION	DATE	DRAWN BY: BDM/SF
C	ISSUED FOR BID	5-29-2020	
B	90% CITY COMMENTS	4-28-2020	
A	90% PERMIT PROGRESS SET	3-26-2020	

DESIGNED BY: ANL

DEMOLITION PLAN

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

JOB NO.:0232277.00
DATE: JULY 2020
SCALE: 1" = 30'
SHEET: 3 OF --

C-001

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\Wip\Drawings\Civil\0232277.00 C100.dwg Jul 31, 2020 - 9:49am

WEST COMMERCIAL STREET
U.S. ROUTE 1A

PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST.

N73°01'23"E
1053.20'

N16°58'37"W
149.35'

S70°47'58"W
381.52'

N:295843.13
E:2927103.20

N:295526.82
E:2927402.54

N21°46'06"W
105.41'

400'±
S37°45'10"W

400'±
S62°18'00"W

1174'±

LAND NOW OR FORMERLY
OWNED BY
NEW YARD, LLC
30887/247

PROPERTY LINE

FORE RIVER

HIGHEST ANNUAL TIDE
LINE ELEVATION 7.2
NGVD 1929

MEAN HIGH WATER
(MHW) = 4.952'

MEAN HIGH WATER
(MHW) = 4.952'

100 YEAR
FLOOD LINE

FORMER HARBOR COMMISSIONERS LINE OF 1929

250' FROM H.A.T.
SHORELAND ZONE

75' SHORELAND ZONE SETBACK

75' SETBACK FROM MHW

75' SETBACK FROM MHW

25' SETBACK FROM MHW

PROPOSED COLD
STORAGE FACILITY
FFE=14.00

NEW 4" WHITE STRIPING

STOP LINE, WHITE, 24-INCH WIDTH

STRIPE PAVEMENT, MATCH EXISTING PATTERN

EXISTING LIGHT TO REMAIN

EXISTING LIGHT TO REMAIN

EXISTING LIGHT TO REMAIN

EXISTING LIGHT TO REMAIN

30' WIDE SEWER EASEMENT TO CITY OF PORTLAND 31021/187 31378/333

20' WIDE CMP EASEMENT

DOUBLE 4" YELLOW PAVEMENT STRIPE

APPROXIMATE LOCATION OF EXISTING GATE TO BE PRESERVED AND PROTECTED

EXISTING FENCE TO REMAIN

7' TIPDOWN (TYP)

RAISED CONCRETE ISLAND

GATES (BY OTHERS)

CARD ACCESS

CONCRETE CURB (TYP)

EXISTING PAVEMENT TO REMAIN

INSTALL GRAVEL BETWEEN CURB AND EXISTING FENCE

REMOVE AND RESET EXISTING FENCE AS NEEDED TO INSTALL CURB, COORDINATE WITH MAINE PORT AUTHORITY

PAD MOUNTED TRANSFORMER WITH CONTAINMENT

5' WIDE CONCRETE SIDEWALK, SEE DETAIL

7' TIPDOWN

4" WHITE STRIPE AT 12" O.C.

WHEEL STOP (TYP OF 19)

LOAM AND SEED (TYP)

CONCRETE CURB (TYP)

BOLLARD (TYP OF 25)

SEE LANDSCAPE DRAWING

STANDARD DUTY BITUMINOUS PAVEMENT, (TYP)

4" WHITE SOLID LINE (TYP)

LIGHT POLE (TYP) SEE SITE LIGHTING PLAN

SNOW STORAGE (TYP)

HANDICAP PARKING SIGN (MUTCD R7-8 & R7-8a) (TYP OF 2)

CONCRETE PAD FOR GENERATOR CONNECTION PANEL PROTECTED BY BOLLARDS

7' TIPDOWN

SIDEWALK DETECTABLE WARNING PANEL, SEE DETAIL

7' TIPDOWN

ADA ACCESSIBLE SPACE (TYP)

GENERATOR PAD

LAWN AREA (TYP), SEE LANDSCAPE PLAN

5 FOOT WIDE CONCRETE SIDEWALK

7' TIPDOWN (TYP)

5 FOOT PEDESTRIAN GATE

24 FOOT GATE

PROPOSED 6' TALL CHAIN LINK FENCE

CONNECT TO EXISTING FENCE, FIELD LOCATE TO COORDINATE TERMINATION WITH EXISTING FENCE POST LOCATION

EXISTING FENCE TO REMAIN

BIKE RACKS (TYP OF 3)

STOP SIGN (MUTCD R1-1)

ADA ACCESSIBLE CURB RAMP

SIDEWALK DETECTABLE WARNING PANEL, SEE DETAIL

7' TIPDOWN

6 FOOT WIDE STRIPED CROSSWALK

RAISED CONCRETE ISLAND

GUARD BOOTH (BY OTHERS)

4" YELLOW STRIPING AT 4' O.C.

SEE LANDSCAPING PLANS

90' VIEW CORRIDOR

SAWCUT EXISTING PAVEMENT, MATCH EXISTING GRADE (TYP)

EXISTING PAVEMENT TO REMAIN

20' WIDE SLIDING VEHICLE GATE (CONTROLLED FROM GUARD BOOTH, BY OTHERS)

HEAVY DUTY BITUMINOUS PAVEMENT (TYP)

CONNECT TO EXISTING FENCE, FIELD LOCATE TO COORDINATE TERMINATION WITH EXISTING FENCE POST LOCATION

STOP SIGN (MUTCD R1-1)

LOAM AND SEED (TYP)

EXISTING FENCE TO REMAIN

RAMP, SEE ARCHITECTURAL PLANS

STAIRS (TYP) SEE ARCHITECTURAL PLANS

LIGHT POLE (TYP) SEE SITE LIGHTING PLAN

UNITIL GAS FACILITY

SNOW STORAGE (TYP)

LOADING DOCK SEE ARCHITECTURAL PLANS

BOLLARD

COMPACTOR

CONCRETE LANDING GEAR PAD (SEE STRUCTURAL PLANS)

4" WHITE SOLID LINE (TYP)

SITE LANDSCAPING, SEE LANDSCAPE PLANS

TRUCK YARD RIGID (CONCRETE) PAVEMENT, SEE STRUCTURAL PLANS

LOAM AND SEED (TYP)

LIMIT OF HEAVY DUTY PAVEMENT

SNOW STORAGE (TYP)

6 FOOT TALL CHAIN LINK FENCE

24 FOOT GATE

GRAVEL WALKWAY

EXIT STAIR (TYP) SEE ARCHITECTURAL PLANS

5 FOOT PEDESTRIAN GATE

LOAM AND SEED (TYP) SEE LANDSCAPE PLANS

BUILDING LAYOUT TABLE		
Point #	Northing	Easting
1	295867.59	2927302.56
2	295598.18	2927396.04
3	295716.89	2927738.20
4	295918.16	2927668.36
5	295931.97	2927708.02
6	295990.23	2927687.81
7	295977.23	2927650.34
8	295992.66	2927644.98
9	295911.91	2927412.25
10	295906.32	2927414.19

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

ISSUED FOR BID - NOT FOR CONSTRUCTION

WOODARD & CURRAN
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Portland, Maine 04102
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COMMITMENT & INTEGRITY DRIVE RESULTS

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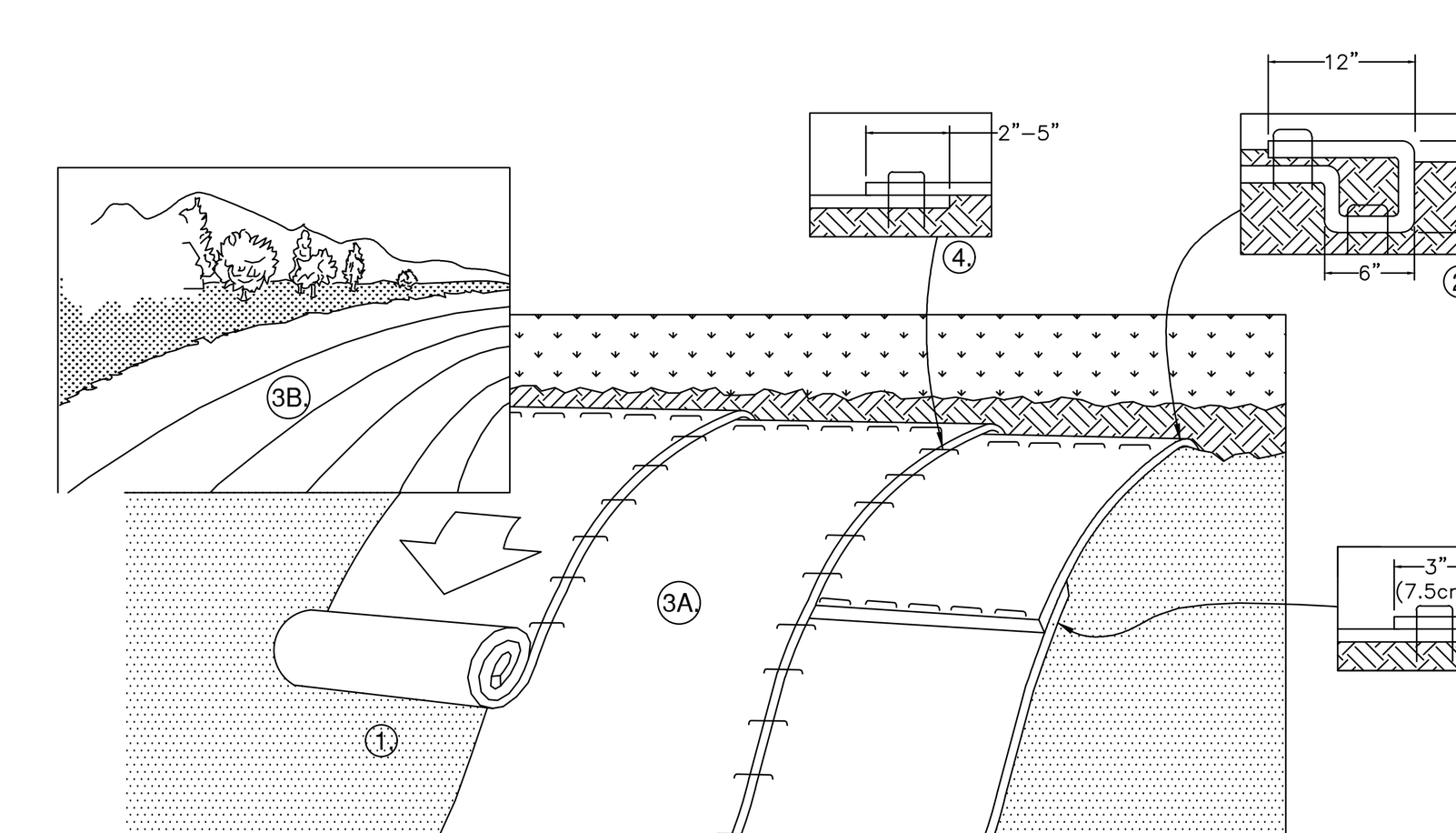
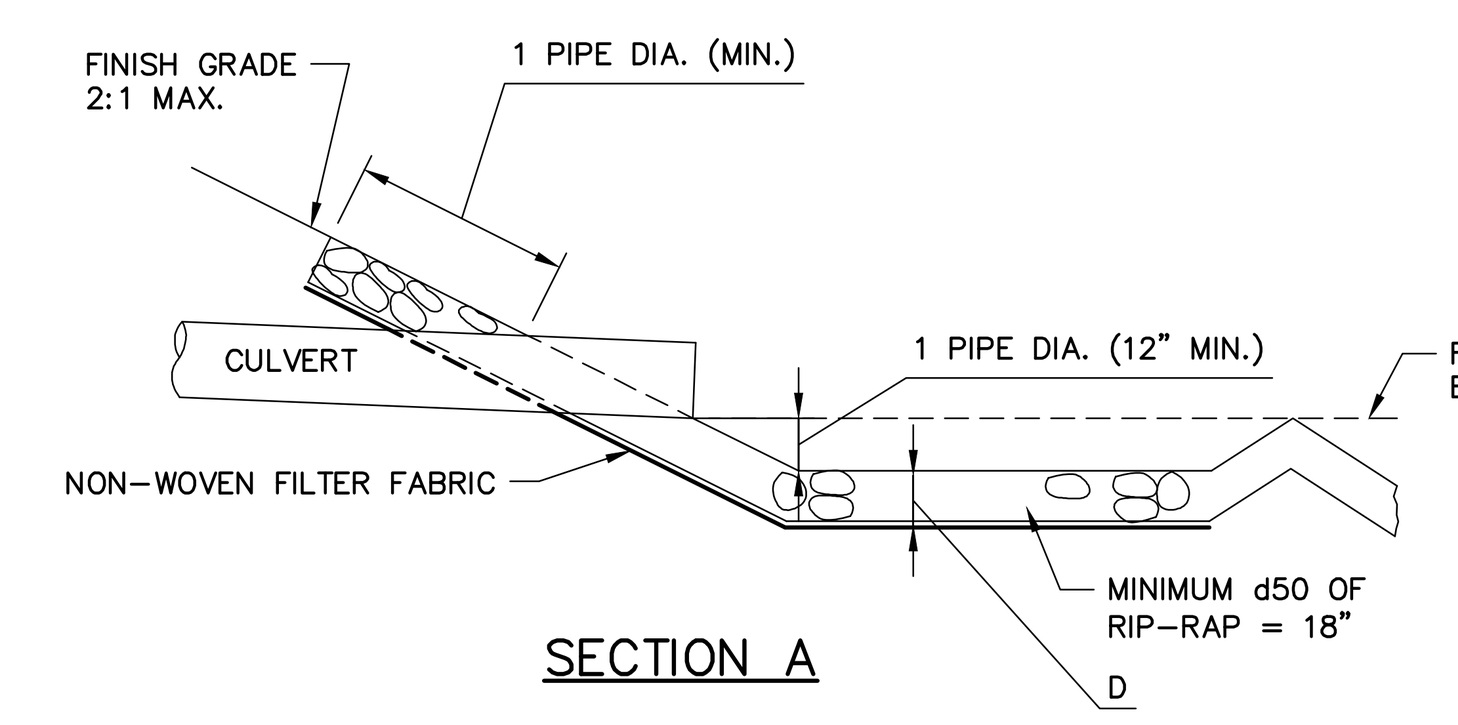
STATE OF MAINE
DARRIN B. STAIRS
No. 15118
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE



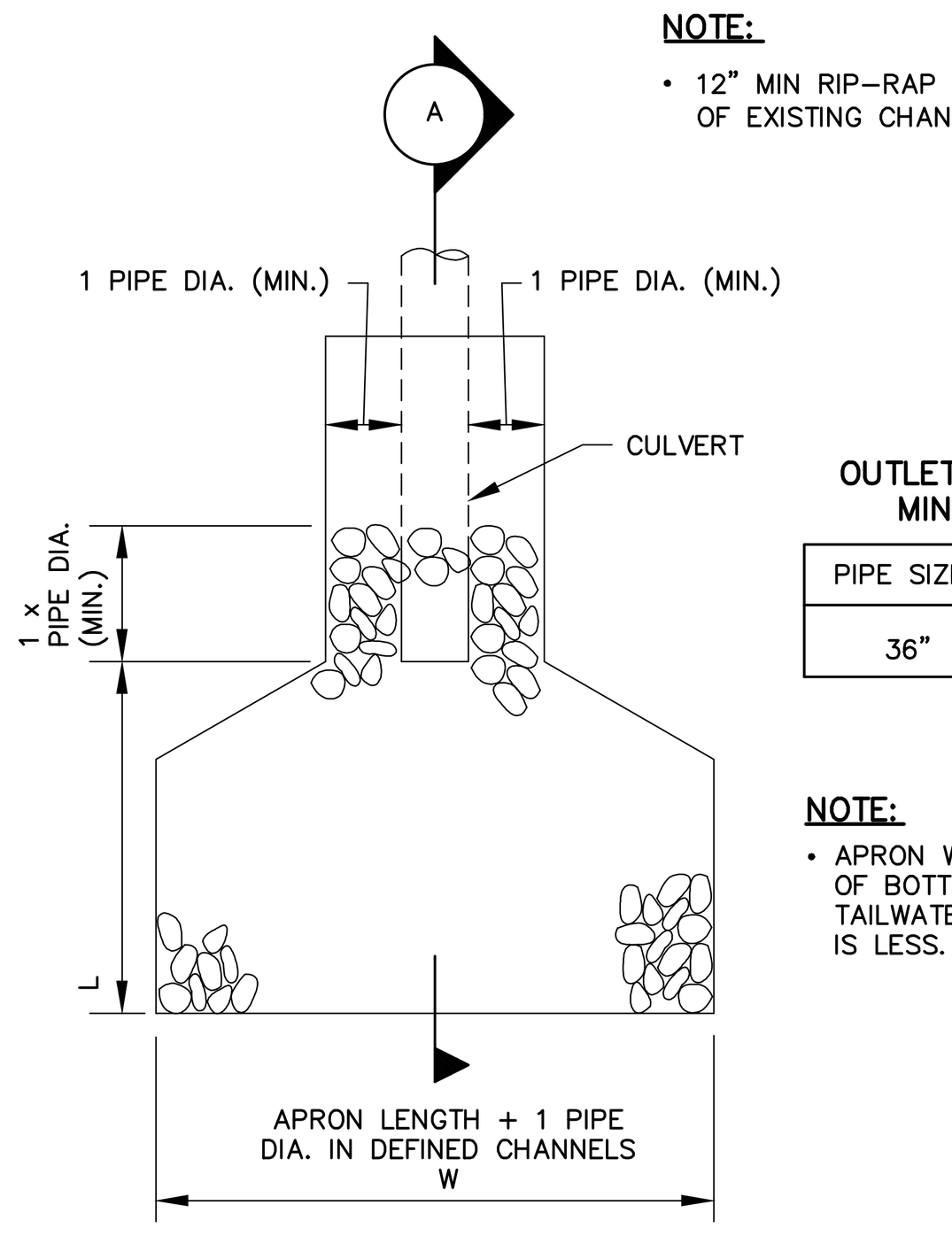
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED AS WELL AS REMOVING ANY PROTRUDING ROCKS, STUMPS OR ROOTS. DURING THE GROWING SEASON (APRIL 15–SEPTEMBER 15) USE RECP'S ON THE BASE OF GRASSED WATERWAYS, SOIL SLOPES HAVING A GRADE GREATER THAT 15%, OR ANYWHERE WHERE HAY MULCH HAS PROVEN TO BE INEFFECTIVE AT CONTROLLING SHEET EROSION. RECP'S ARE A MANUFACTURED COMBINATION OF MULCH AND NETTING DESIGNED TO PREVENT EROSION AND RETAIN SOIL MOISTURE. FOR OVER WINTER PROTECTION, APPLY RECP'S ON THE BASE AND SIDE SLOPES OF GRASSED WATERWAYS AND ON SLOPES STEEPER THAN AN 8% GRADE.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP's WIDTH. NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
6. UNTIL GRASS IS ABUNDANT, INSPECT PERIODICALLY AND AFTER EACH RAINSTORM TO CHECK FOR EROSION. IMMEDIATELY REPAIR AND ADD MORE MULCH UNTIL GRASSES ARE FIRMLY ESTABLISHED. DO NOT MOW THE FIRST YEAR.

ROLLED EROSION CONTROL MATTING
N.T.S.



SECTION A

NOTE:
- 12" MIN RIP-RAP UP SIDE SLOPES OF EXISTING CHANNEL (IF PRESENT)



OUTLET PROTECTION APRON MINIMUM DIMENSIONS

PIPE SIZE	L	W	D
36"	10 FT.	15 FT.	18"

NOTE:
- APRON WIDTH SHALL EXTEND FULL WIDTH OF BOTTOM AND ONE FOOT ABOVE MAX. TAILWATER OR UP BANK FULL, WHICHEVER IS LESS.

PLAN VIEW

45 C-008 RIP-RAP OUTLET PROTECTION APRON DETAIL
N.T.S.

EROSION AND SEDIMENTATION CONTROL NOTES

TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE THE USE OF STABILIZED CONSTRUCTION ENTRANCES, HYDRAULIC MULCH, HAY AND STRAW MULCH, EROSION CONTROL BLANKET, TURF REINFORCED MATTING, RIPRAP AND TEMPORARY SEEDING. TEMPORARY SEDIMENT CONTROL MEASURES INCLUDE THE USE OF SILT FENCE, EROSION CONTROL MIX BERMS, PLUNGE POOLS, CHECK DAMS, SEDIMENT TRAPS, CATCH BASIN SEDIMENT COLLECTION BAGS AND GEOTEXTILE FILTER BAGS. PERMANENT MEASURES INCLUDE THE USE OF RIPRAP AT EXPOSED STORMDRAIN AND CULVERT INLETS AND OUTLETS, ARMORED SWALES AND SLOPES AND PERMANENT VEGETATION.

GENERAL

A. THE PROJECT SHALL CONFORM WITH THE STANDARDS OF THE MAINE CONSTRUCTION GENERAL PERMIT, IF APPLICABLE. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL BMPS HANDBOOK PUBLISHED BY THE MAINE DEP UNLESS OTHERWISE NOTED IN THESE PLANS. HTTP://WWW.MAINE.GOV/DEP/LAND/EROSION/ESCBMPS/

B. ANY ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES DEEMED NECESSARY BY THE OWNER'S REPRESENTATIVE, DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND/OR MUNICIPAL OFFICIALS SHALL BE INSTALLED BY THE CONTRACTOR.

C. THE CONTRACTOR IS RESPONSIBLE FOR ALL FINES RESULTING FROM EROSION OR SEDIMENTATION FROM THE SITE TO SURROUNDING PROPERTIES, WATER BODIES, OR WETLANDS AS A RESULT OF THIS PROJECT.

D. THE CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE SITE WHENEVER POSSIBLE WHILE ALLOWING PROPER SITE DEVELOPMENT.

E. CONSTRUCTION STAGING SHALL BE CONDUCTED IN A WAY TO MINIMIZE THE POTENTIAL FOR STORMWATER RUN-ON TO DISTURBED AREAS.

F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR/REPLACEMENT/MAINTENANCE OF ALL EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE ABOVE PERSONNEL. DESCRIPTIONS OF PERMANENT STABILIZATION FOR VARIOUS COVER TYPES FOLLOWS:

i. FOR SEEDED AREAS, PERMANENT STABILIZATION MEANS THAT 90% OF THE DISTURBED AREA IS COVERED WITH REASONABLY THICK UNIFORM STAND OF PERMANENT GRASS SPECIES, FREE FROM SIZABLE THIN OR BARE SPOTS.
ii. FOR SODDED AREAS, PERMANENT STABILIZATION MEANS THAT COMPLETE BINDING OF THE SOD ROOTS INTO THE UNDERLYING SOIL WITH NO SLUMPING OF THE SOD OR DIE OFF.
iii. FOR MULCHED AREAS, PERMANENT STABILIZATION MEANS TOTAL COVERAGE OF THE EXPOSED AREA WITH AN APPROVED MULCH MATERIAL.
iv. FOR AREAS STABILIZED WITH RIPRAP, PERMANENT STABILIZATION MEANS THAT SLOPES STABILIZED WITH RIPRAP HAVE AN APPROPRIATE BACKING OF A WELL-GRADED GRAVEL OR APPROVED GEOTEXTILE. STONE MUST BE SIZED APPROPRIATELY AND IN ACCORDANCE WITH SECTION E-6 OF THE MAINE EROSION AND SEDIMENT CONTROL BMP MANUAL.
v. FOR PAVED AREAS, PERMANENT STABILIZATION MEANS THE PLACEMENT OF THE ASPHALT BINDER COURSE.
vi. FOR OPEN CHANNELS, LEVEL SPREADERS, ENGINEERED BUFFERS OR OTHER DESIGNED STORMWATER CONVEYANCE STRUCTURE, PERMANENT STABILIZATION MEANS THE CHANNELIZED AREA(S) IS STABILIZED WITH MATURE VEGETATION AT LEAST THREE INCHES IN HEIGHT, WITH APPROVED RIPRAP, OR WITH OTHER NON-EROSIVE LINING CAPABLE OF WITHSTANDING THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHOUT RELIANCE ON CHECK DAMS TO SLOW FLOW. THERE SHALL BE NO EVIDENCE OF SLUMPING, UNDERCUTTING OR DOWNCUTTING OF THE DESIGNED CHANNEL.

H. IF THE AREA WILL REMAIN UNWORKED FOR MORE THAN ONE YEAR OR HAS BEEN BROUGHT TO FINAL GRADE, AND WILL NOT BE BUILT ON, THEN IMMEDIATELY PROVIDE PERMANENT STABILIZATION USING VEGETATION THROUGH PLANTING, SEEDING, SOD OR THROUGH THE USE OF PERMANENT MULCH OR RIPRAP. IF USING VEGETATION FOR STABILIZATION, SELECT THE PROPER VEGETATION FOR THE LIGHT, MOISTURE, AND SOIL CONDITIONS. AMEND AREAS OF DISTURBED, OVERLY-COMPACTED SUBSOIL WITH TOPSOIL OR COMPOST AND LIGHTLY TILL 2–3" OF SOIL AMENDMENTS INTO THE TOP 8" OF SOIL.

I. PERMANENT SEEDING: SEED MIXES AND APPLICATION ARE SPECIFIED ON THE LANDSCAPING PLANS.

J. PROTECT ALL SEEDED AREAS WITH MULCH OR EROSION CONTROL BLANKET IN AREAS OF SHEET OR CONCENTRATED FLOWS. MULCH ALL AREAS SO THAT SOIL IS NOT VISIBLE THROUGH THE MULCH REGARDLESS OF THE APPLICATION RATE. SCHEDULE SEEDING OR SODDING TO AVOID FAILURE DUE TO SUMMER DROUGHT AND FALL FROST. NEWLY SEEDED AREAS SHOULD BE PROTECTED FROM VEHICLE TRAFFIC, PEDESTRIAN TRAFFIC AND CONCENTRATED RUNOFF UNTIL THE VEGETATION IS WELL ESTABLISHED. AREAS MUST BE REWORKED AND RESTABILIZED IF GERMINATION IS SPARSE OR SURFACE EROSION IS EVIDENT.

K. DITCH LININGS AND RIPRAP INLET AND OUTLET PROTECTION SHALL BE INSTALLED WITHIN 48 HOURS OF COMPLETING THE GRADING OF THAT SECTION OF DITCH OR INSTALLATION OF THE CULVERT.

L. EROSION CONTROL BLANKET SHALL BE INSTALLED ON ALL PERMANENT SLOPES STEEPER THAN 3:1, IN THE BASE OF DITCHES AND ANY DISTURBED AREAS WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE (WETLANDS AND WATER RESOURCES). EROSION CONTROL BLANKET SHALL BE NORTH AMERICAN GREEN S150BN OR APPROVED EQUAL. EROSION CONTROL BLANKET SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

M. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL TEMPORARY EROSION CONTROL MEASURE UPON STABILIZATION OF PROJECT AREA & COST SHALL BE INCIDENTAL TO CONTRACT.

WINTER CONDITIONS

A. WINTER CONSTRUCTION IS CONSTRUCTION ACTIVITY PERFORMED DURING THE PERIOD FROM NOVEMBER 1 THROUGH APRIL 15. IF AREAS WITHIN THE CONSTRUCTION AREA ARE NOT STABILIZED WITH TEMPORARY OR PERMANENT MEASURES OUTLINED ABOVE BY NOVEMBER 1 THEN THE SITE MUST BE PROTECTED WITH ADDITIONAL STABILIZATION MEASURES THAT ARE SPECIFIC TO WINTER CONDITIONS.

GOOD HOUSEKEEPING AND POLLUTION PREVENTION

A. SPILL PREVENTION CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER RUNOFF AND APPROPRIATE SPILL PREVENTION, CONTAINMENT AND RESPONSE PLANNING AND IMPLEMENTATION.

B. DURING CONSTRUCTION, PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUND OR SURFACE WATERS MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO INFILTRATION AREAS. AN "INFILTRATION AREA" IS ANY ARE OF THE SITE THAT BY DESIGN, OR AS A RESULTS OF SOIL AND TOPOGRAPHY, ACCUMULATES RUNOFF THAT INFILTRATES IN THE SOIL. DIKES, BERMS, SUMPS AND OTHER FORMS OF TEMPORARY SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.

C. LOCATE ALL MATERIAL STOCKPILES WITH CONSIDERATION FOR STORMWATER DRAINAGE PATTERNS AND INFRASTRUCTURE.

D. TAKE ALL REASONABLE MEASURES TO MINIMIZE DUST RESULTING FROM THE PROJECT. OIL MAY NOT BE USED FOR DUST CONTROL.

E. LOCATE ALL LITTER, CONSTRUCTION DEBRIS AND CONSTRUCTION CHEMICALS WITH CONSIDERATION FOR STORMWATER DRAINAGE PATTERNS AND INFRASTRUCTURE.

F. TRENCH OR FOUNDATION DE-WATERING MUST BE SPREAD THROUGH SUFFICIENT NATURAL BUFFERS THAT HAVE CAPACITY TO INFILTRATE THE PUMPED WATER OR SHOULD BE PUMPED TO DESIGNED CONSTRUCTION DEWATERING DEVICES AS DESCRIBED IN THE MAINE EROSION AND SEDIMENT CONTROL BMPS HANDBOOK.

G. SEDIMENTS AND SOIL MATERIALS SHOULD BE SWEPT FROM PAVED SURFACES AT THE END OF EACH WORKDAY OR PRIOR TO RAIN EVENTS, WHENEVER POSSIBLE.

INSPECTION AND MAINTENANCE

A. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROLS, INCLUDING THE STANDARDS IN THE MAINE CONSTRUCTION GENERAL PERMIT, THE MAINE EROSION AND SEDIMENT CONTROL BMPS HANDBOOK OR ANY MUNICIPAL REQUIREMENTS MUST CONDUCT THE INSPECTION. THIS PERSON MUST BE IDENTIFIED IN THE INSPECTION LOG. IF ADDITIONAL BMPS OR MODIFICATIONS TO BMPS ARE NECESSARY, THE MODIFICATIONS MUST BE IMPLEMENTED WITH 7 CALENDAR DAYS OR PRIOR TO ANY PRECIPITATION EVENT. ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS ARE PERMANENTLY STABILIZED.

B. AN INSPECTION AND MAINTENANCE LOG MUST BE KEPT BY THE CONTRACTOR, SUMMARIZING THE SCOPE OF THE INSPECTION, DATE, AND MAJOR OBSERVATIONS RELATING TO THE OPERATION OF EROSION AND SEDIMENT CONTROL BMPS, MATERIAL STORAGE AREAS, AND VEHICLE ACCESS POINTS TO THE CONSTRUCTION AREA. THE INSPECTION LOG SHOULD BE DELIVERED TO THE PROPERTY OWNER OR RESPONSIBLE CONTRACTING ENTITY UPON COMPLETION OF THE PROJECT.

Inspections:

Regular inspections of all erosion and sedimentation controls shall be made at least weekly and prior to and following storm events. Minimum inspections shall be made as listed in the table below.

Inspected Item	Look For
Mulched Surfaces	Thin mulch or inadequate application. Wind movement.
Seeded Surfaces	Poor seed germination. Loss of mulch. Development of rivulets.
Sediment Barrier	Sediment build-up to one half the height of the barrier. Undermining of the barrier. Supporting stakes loose, toppled, or unmarked. Breaks in barrier.
Perimeter Diversion	Discharge is to stabilized area. Erosion or breaks in barrier. Supporting stakes loose, toppled or unmarked.
Catch Basin Protection	Sediment build-up and structure blockages. Slow flow/Ponding water. Breaks in fabric or voids in barrier.
Dewatering Filter	Breaks in fabric or supporting structure. Slow flow, indicating high sediment build-up.
Construction Entrance	Sedimentation of roadways. Off-site dust complaints.

Permanent Erosion Control:

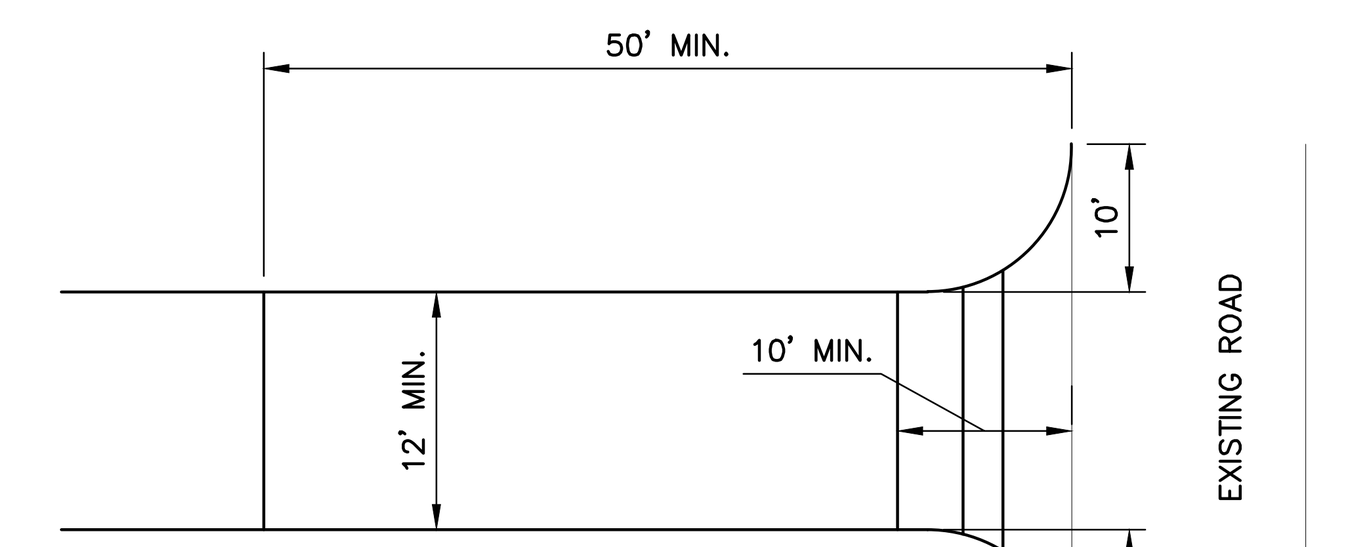
Measure	Dates For Use	Timing, Activity, and Location
Pavement – Base Course – Final Course	When no frost is in ground	Install only in areas shown on the plan, shortly after pavement base is brought to final grade. Install near completion of project.
Permanent Seeding	April 15 to Sept. 15	On final grade areas, within 7 days of grade preparation, prepare topsoil, followed by seed and mulch application.
Dormant Seeding	Sept. 16 to April 15	On final grade areas, with prepared topsoil. Apply seed at double the specified rate on bare soil, and follow with an application of winter mulch.
Ground Cover, Trees, Shrubs	April 15 to Nov. 1	Install with final landscaping.
Permanent Mulch	ALL	Install with final landscaping.

EROSION AND SEDIMENT CONTROL NOTES

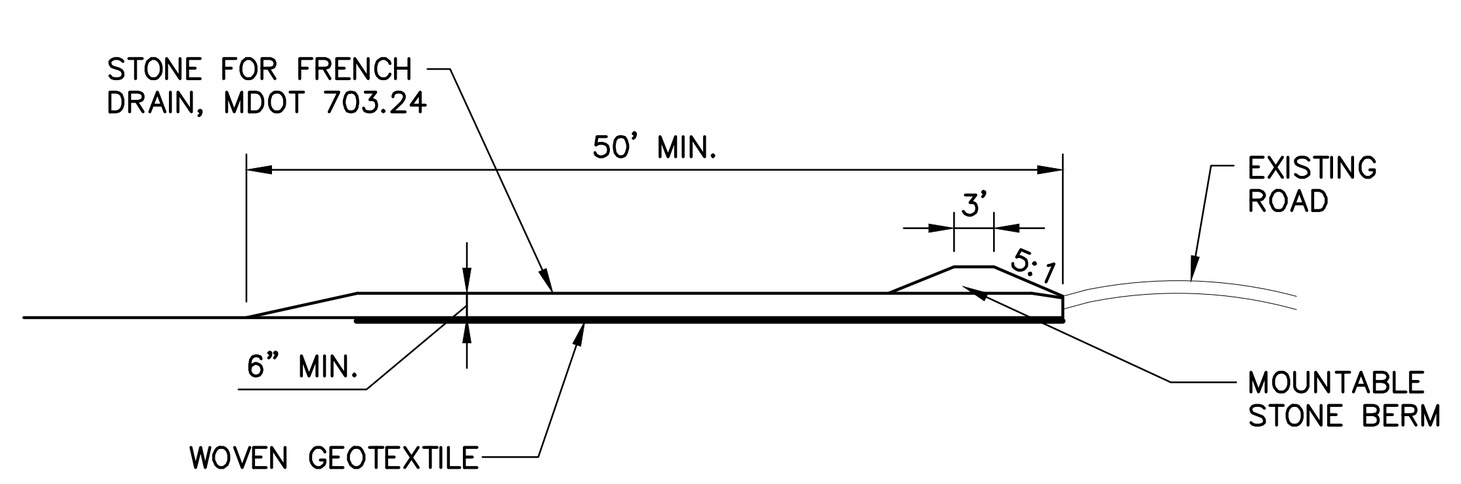
Temporary Erosion Control

Contractor shall prepare and submit a soil erosion and water pollution control plan to engineer

Measure	Dates For Use	Timing, Activity, and Location
Sedimentation Barrier	ALL	Before soil disturbance, install downhill of areas to be disturbed and around material stockpiles.
Up-slope Diversion	ALL	Before soil disturbance, install uphill of areas to be disturbed and material stockpiles.
Catch Basin Protection	ALL	Before soil or pavement disturbance, install ACF Environmental, Inc. High Flow Siltsack, Siltsaver Inlet Filter. or equal, installed per manufacturer's requirements.
Dust Control	ALL	During dry weather, apply water and calcium chloride to control dust.
Temporary Seeding	April 15 to Oct. 1	Soil stockpiles that are not covered and disturbed areas that will not be disturbed again within 14 days. If grass growth provides less than 95% soil coverage by Nov. 1, apply mulch and anchor with erosion control blanket.
Mulch	April 15 to Sept. 15	On all areas of exposed soil prior to rain events or every 7 days, apply 100–150 lbs (2.5 bales) per 1,000 sq ft. by mechanical blower.
Winter Mulch	Sept. 16 to Oct. 31	On all areas of exposed soil prior to precipitation or every 7 days, apply 150 to 170 lbs. mulch (4 bales) per 1,000 sq. ft. by mechanical blower. Erosion control blanket may be used as a substitute for winter mulch.
	Nov. 1 to April 14	On all areas of exposed soil, apply 150 to 170 lbs. mulch (4 bales) per 1,000 sq. ft. and anchor with netting at the end of each working day. Erosion control blanket may be used as a substitute for winter mulch.
Inspections	Until site is permanently stabilized	Inspect the erosion and sedimentation control measures per inspections table below and maintain and repair as necessary



PLAN



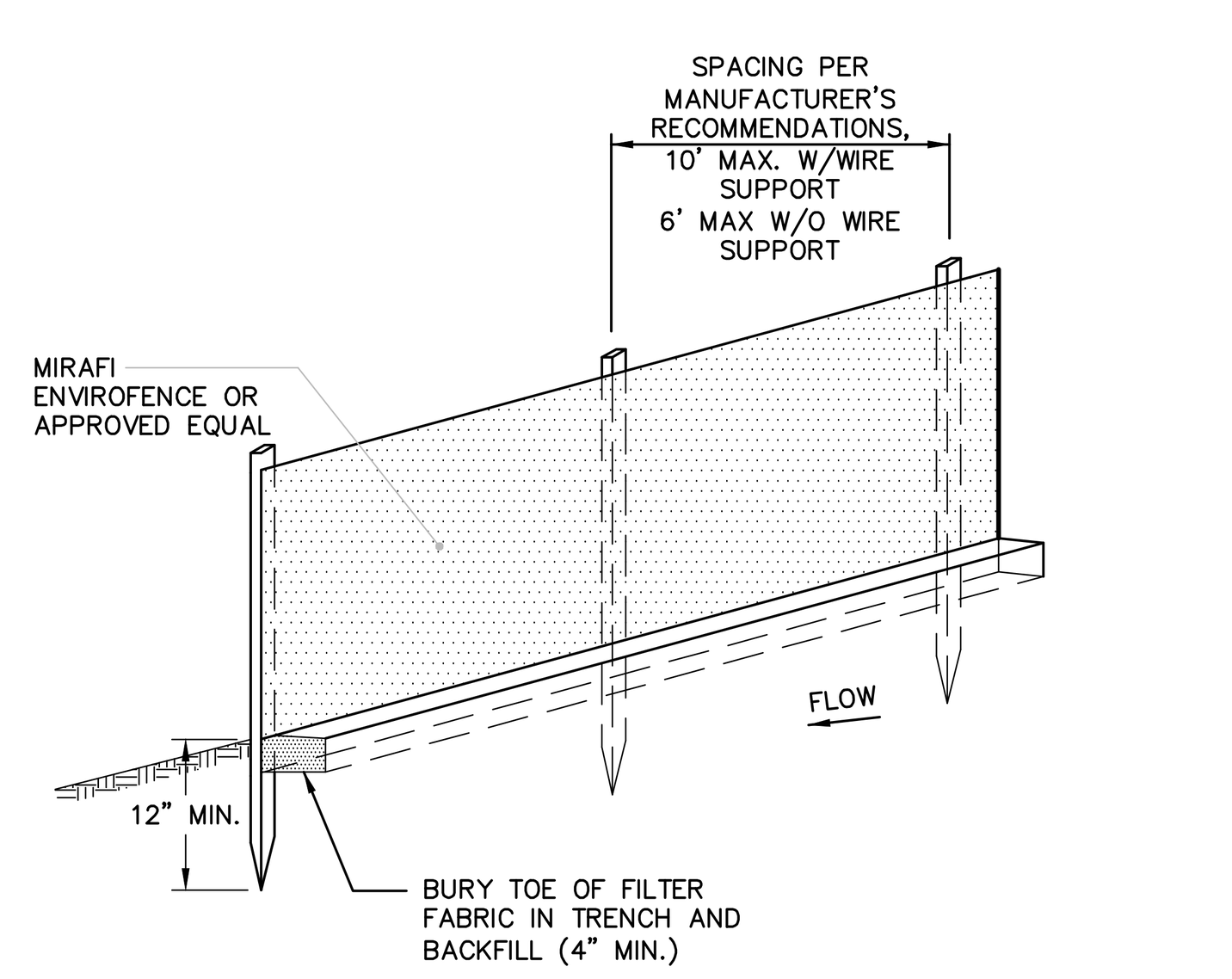
PROFILE

NOTES:
- SIZE AS INDICTED ABOVE UNLESS INDICATED ON DRAWINGS.
- CONSTRUCTION ENTRANCES MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
- WHEEL WASH PITS MAY ALSO BE USED, IF APPROVED.

MAINTENANCE: INSPECT FOR EFFECTIVE REMOVAL OF SOIL FROM VEHICLES PRIOR TO LEAVING THE SITE. SWEEP ANY SOIL FROM ADJACENT ROADWAYS.

REMOVAL: AT LEAST ONE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED UNTIL ALL AREAS OF THE SITE ARE STABILIZED.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
N.T.S.

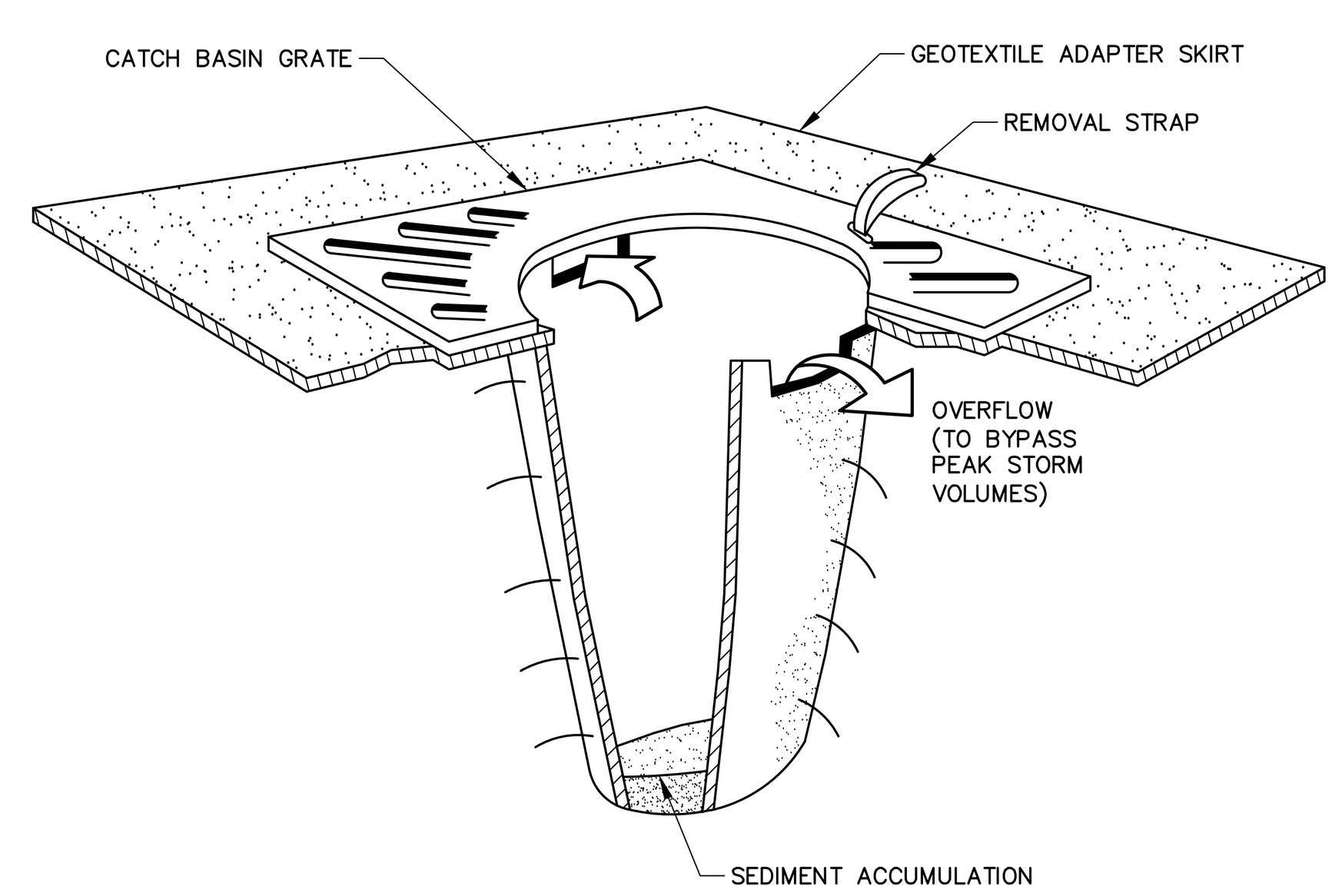


NOTES:
- INSTALL FABRIC ON UPHILL SIDE OF SUPPORT POSTS
- INSTALL SILT FENCE ACROSS SLOPES
- SILT FENCE SHALL NOT BE USED IN DRAINAGE WAYS

MAINTENANCE: INSPECT FOR TEARS IN THE FABRIC OR DAMAGE TO SUPPORTS. REPAIR AS NECESSARY. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES A DEPTH OF SIX-INCHES OR LESS.

REMOVAL: WHEN UPSLOPE AREAS ARE STABILIZED, THE STRUCTURE AND ANY ACCUMULATED SEDIMENT WILL BE REMOVED.

SEDIMENT BARRIER – SILTATION FENCE DETAIL
N.T.S.



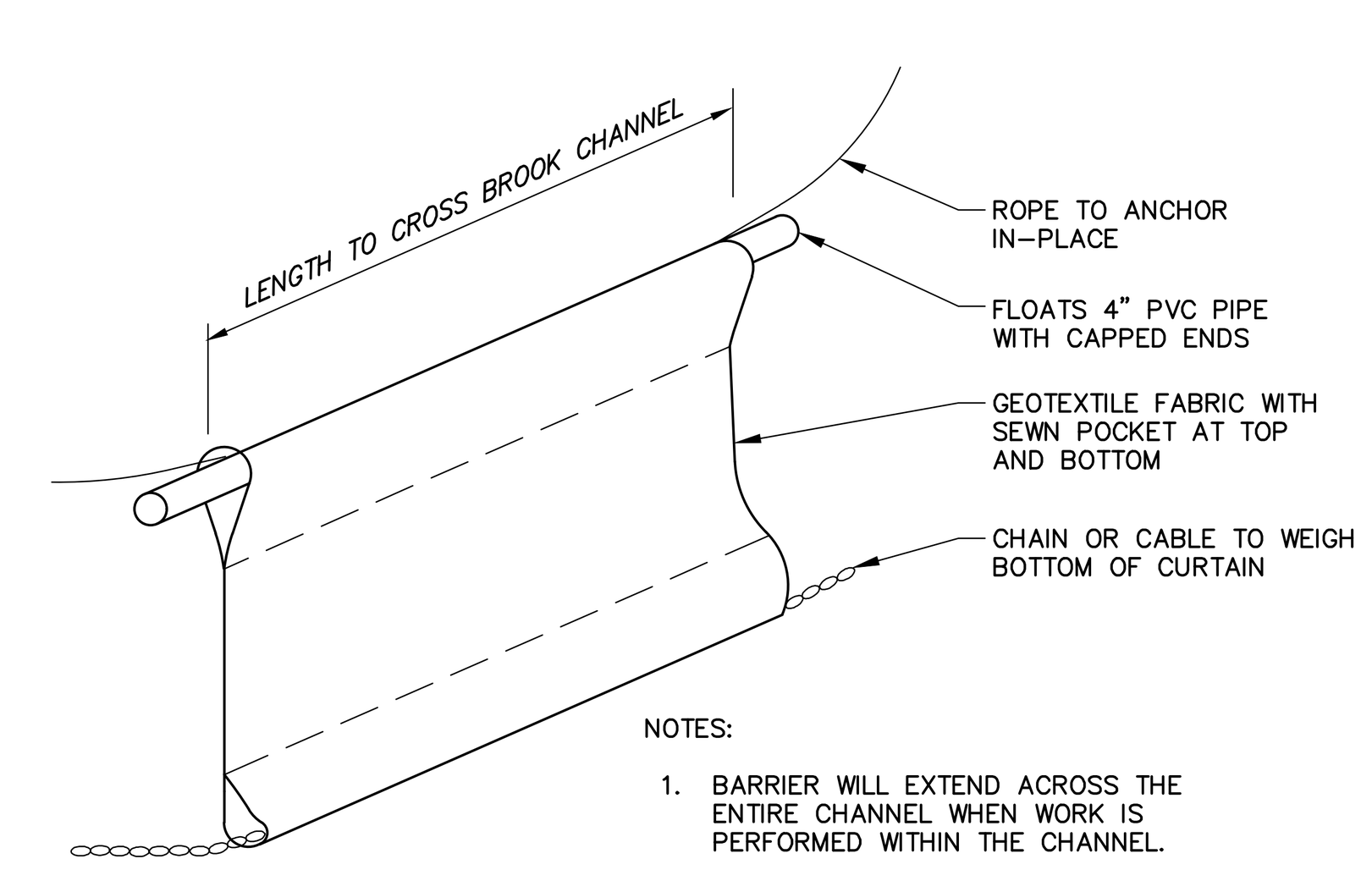
NOTES:

CATCH BASIN PROTECTION TO BE "SILTSACK" (BY ACF ENVIRONMENTAL) OR "STREAM GUARD" (BY FOSS ENVIRONMENTAL SERVICES).

INSERT TO BE EMPTIED IN AN APPROVED MANNER WHEN IT IS 1/2 FULL OF SEDIMENT.

INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN AS REQUIRED.

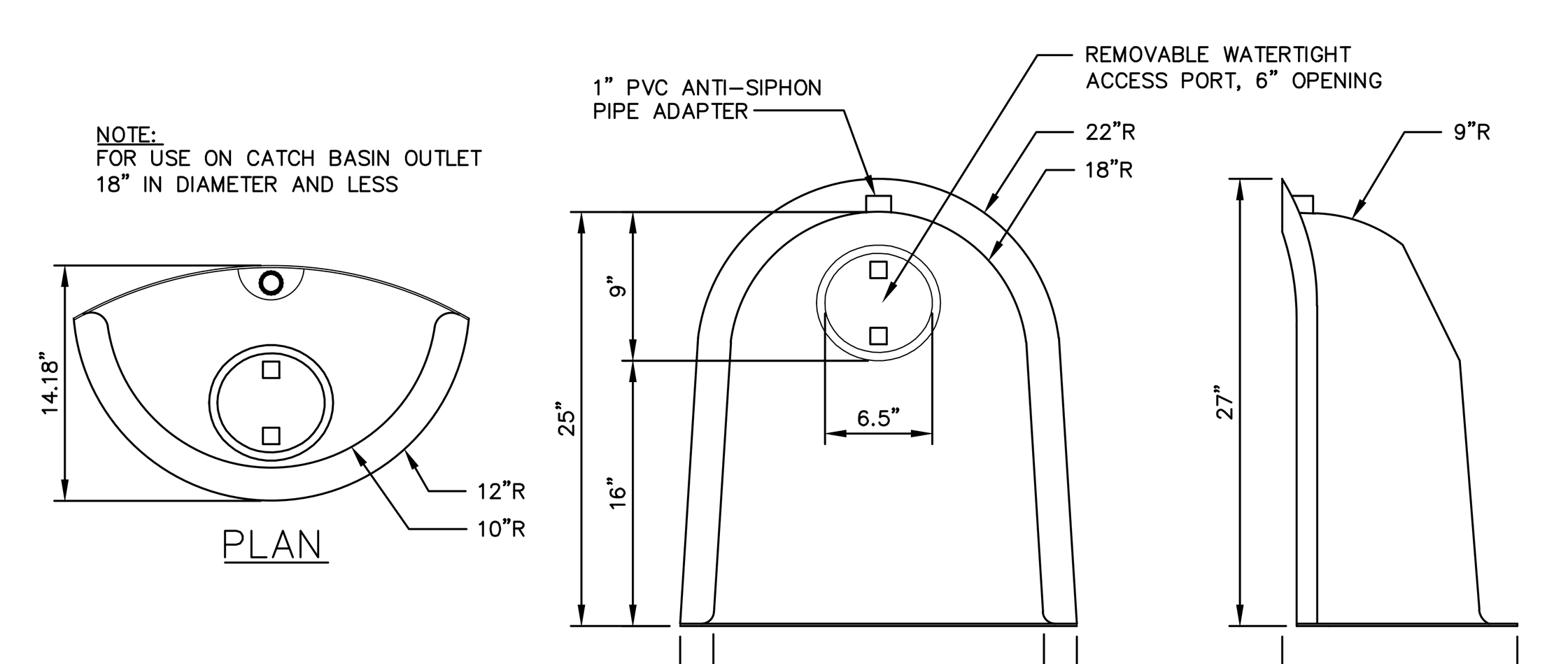
TEMPORARY CATCH BASIN INLET PROTECTION
N.T.S.



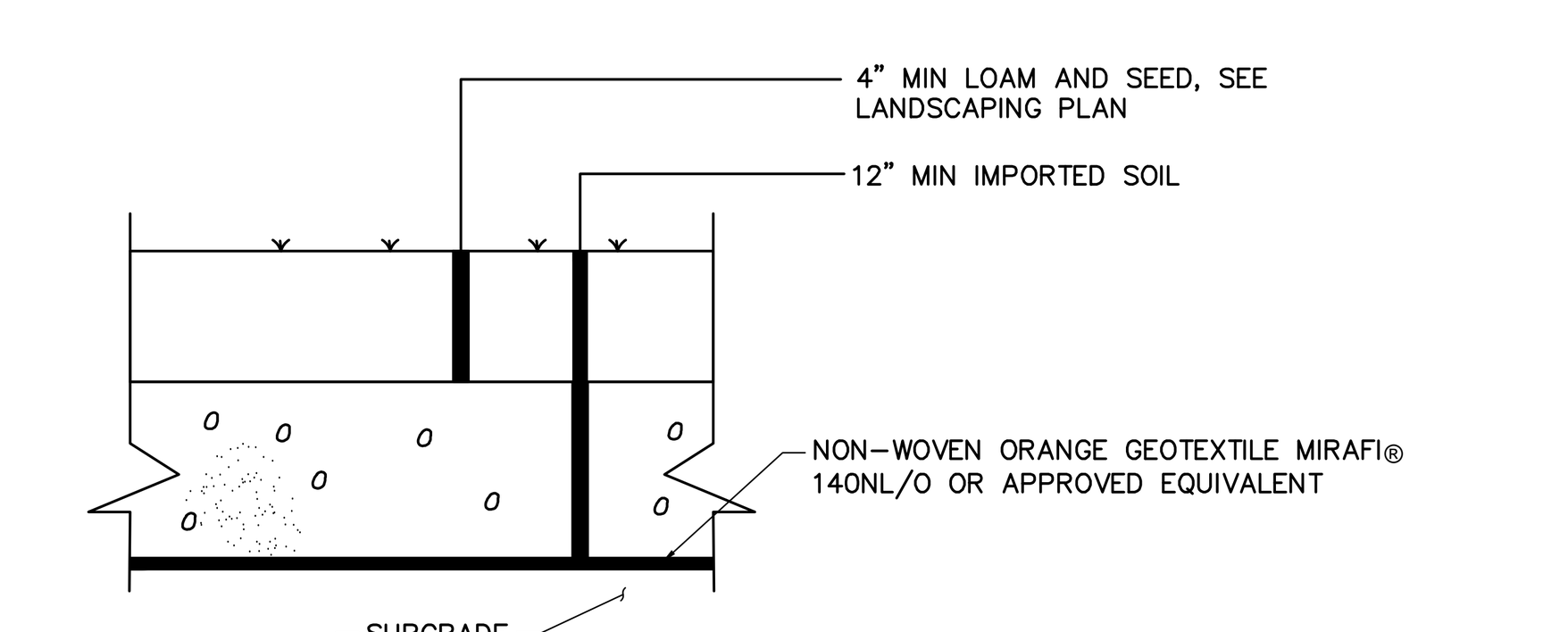
NOTES:
1. BARRIER WILL EXTEND ACROSS THE ENTIRE CHANNEL WHEN WORK IS PERFORMED WITHIN THE CHANNEL.
2. ROPE SHALL BE 1/2" NYLON OR MANILA.

FLOATING TURBIDITY BARRIER DETAIL
N.T.S.

NOTE:
FOR USE ON CATCH BASIN OUTLET 18" IN DIAMETER AND LESS



"THE SNOUT"
N.T.S.



LOAM & SEED DETAIL – OPTION 1
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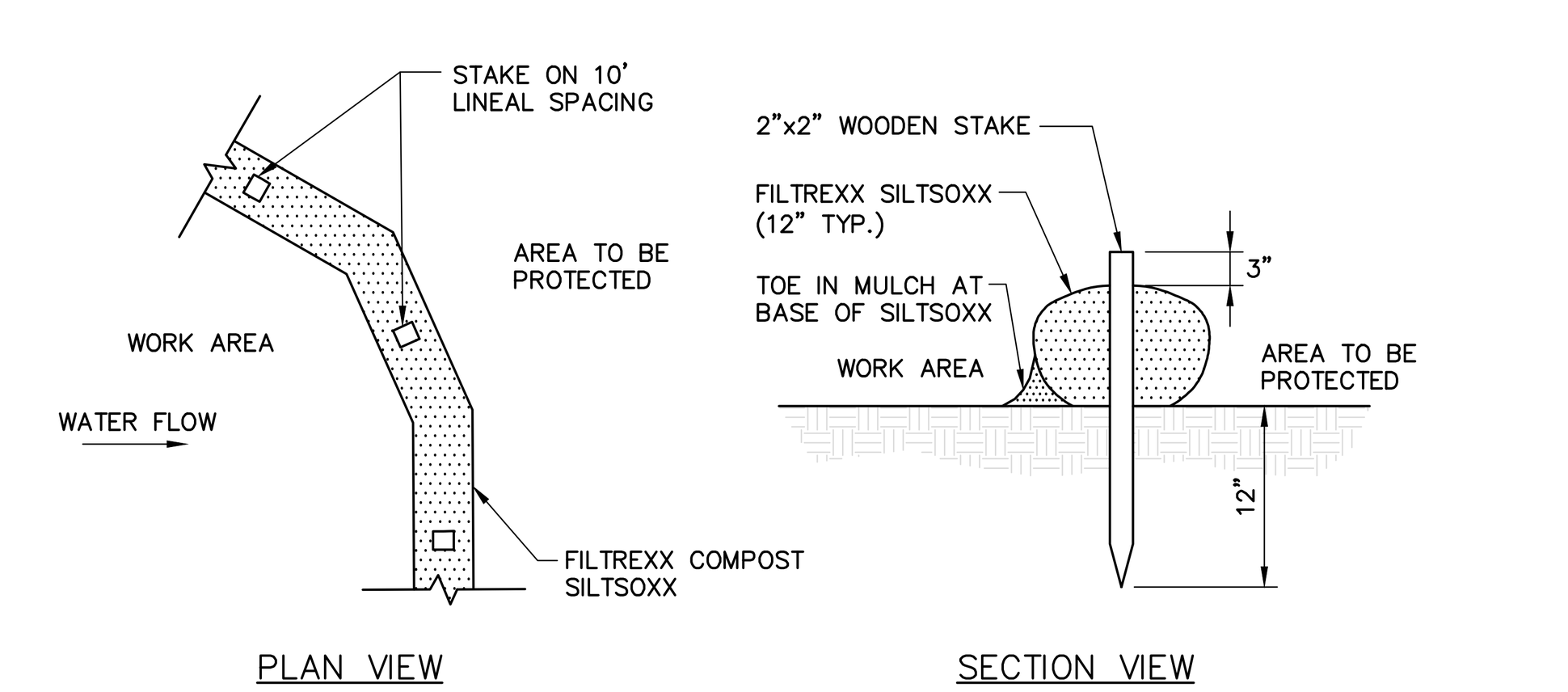
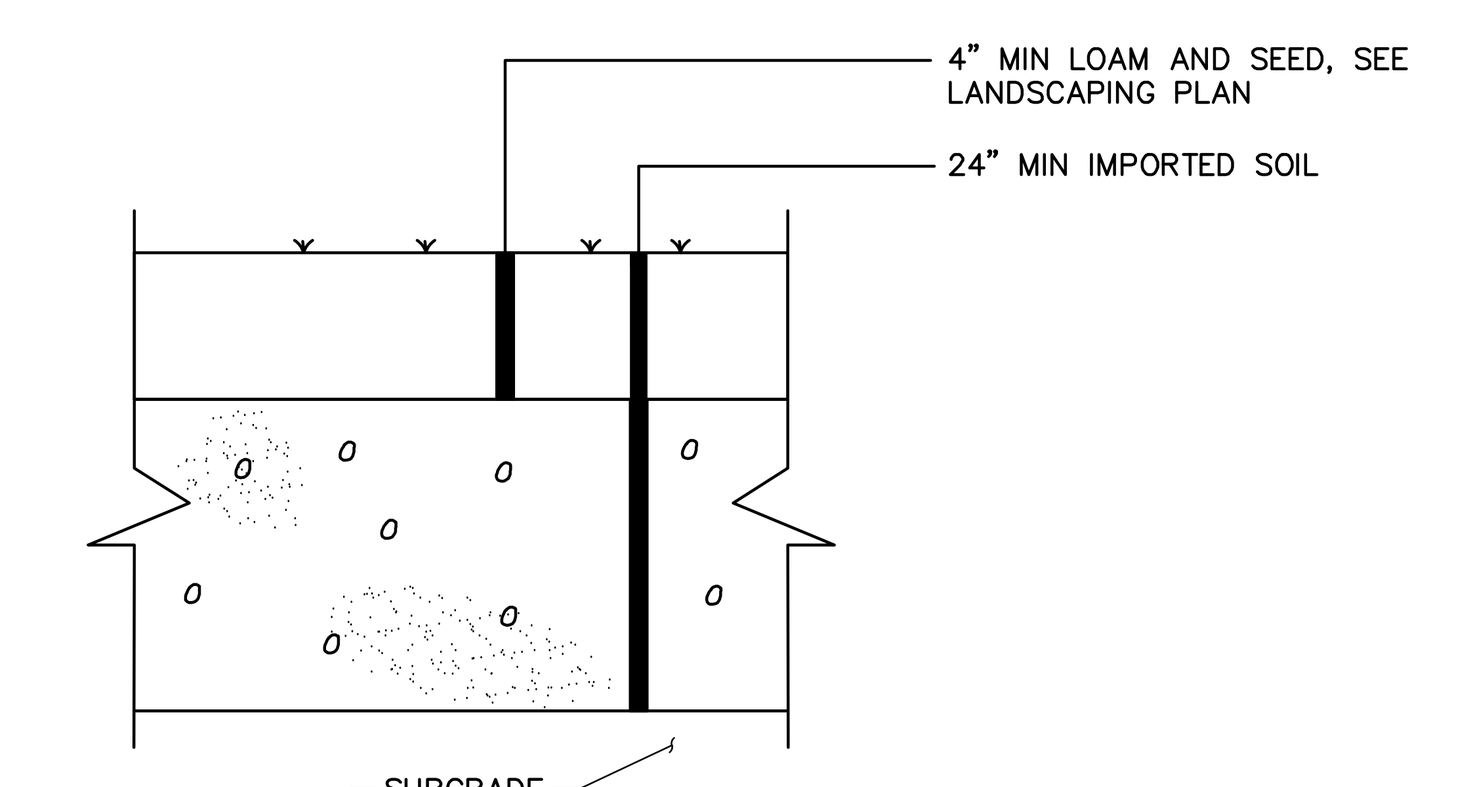
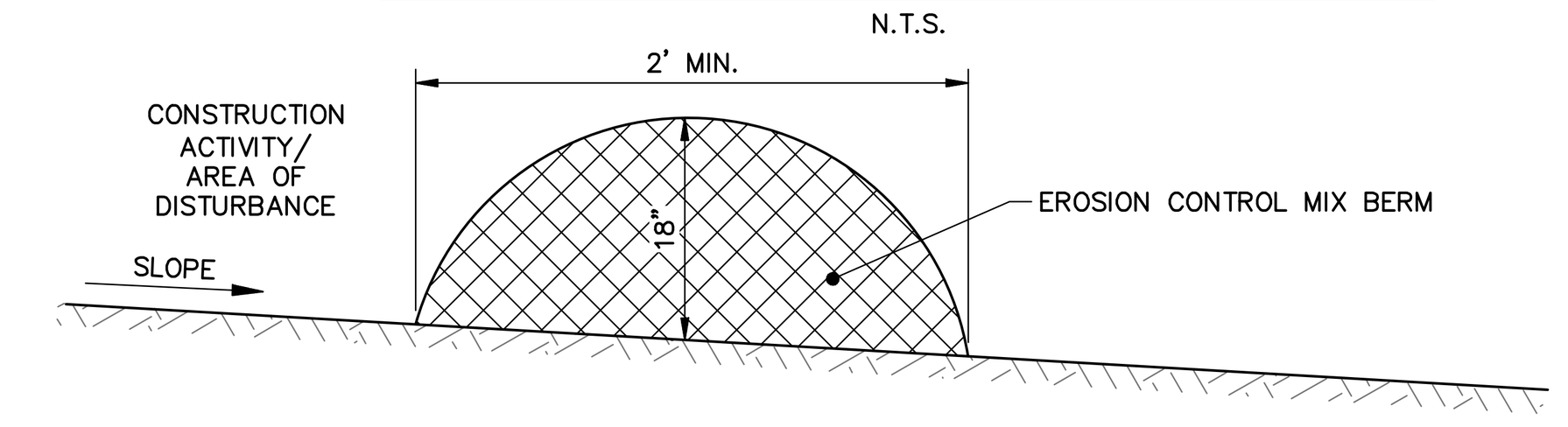


NOTE:
1. WHEN STAKING IS NOT POSSIBLE, HEAVY CONCRETE BLOCKS SHALL BE USED BEHIND THE SEDIMENT CONTROL TO HELP STABILIZE DURING RAINFALL/RUNOFF EVENTS.

SEDIMENT BARRIER – SILTSOXX
N.T.S.



LOAM & SEED DETAIL – OPTION 2
N.T.S.



NOTES:
1. EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF THE PROJECT SITE. IT MUST CONSIST PRIMARILY OF ORGANIC MATERIAL AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.
2. EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS:
   - THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100%, DRY WEIGHT BASIS.
   - PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN AND A MINIMUM OF 70%, MAXIMUM OF 85%, PASSING A 0.75" SCREEN.
   - THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   - LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
   - SOLUBLE SALTS CONTENT SHALL BE < 4.0 MMHOS/CM.
   - THE PH SHOULD FALL BETWEEN 5.0 AND 8.0.

SEDIMENT BARRIER – EROSION CONTROL MIX BERM
N.T.S.

WOODARD & CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
LICENSED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
C	ISSUED FOR BID	5-29-2020
B	RESPONSE TO CITY COMMENTS	5-15-2020
A	BID DRAWING PROGRESS SET	3-26-20

DESIGNED BY: ANL | DRAWN BY: BCM\PF | CHECKED BY: DS | 0232277.00 C20X.dwg

CIVIL DETAILS - 1

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 7 OF --

C-200

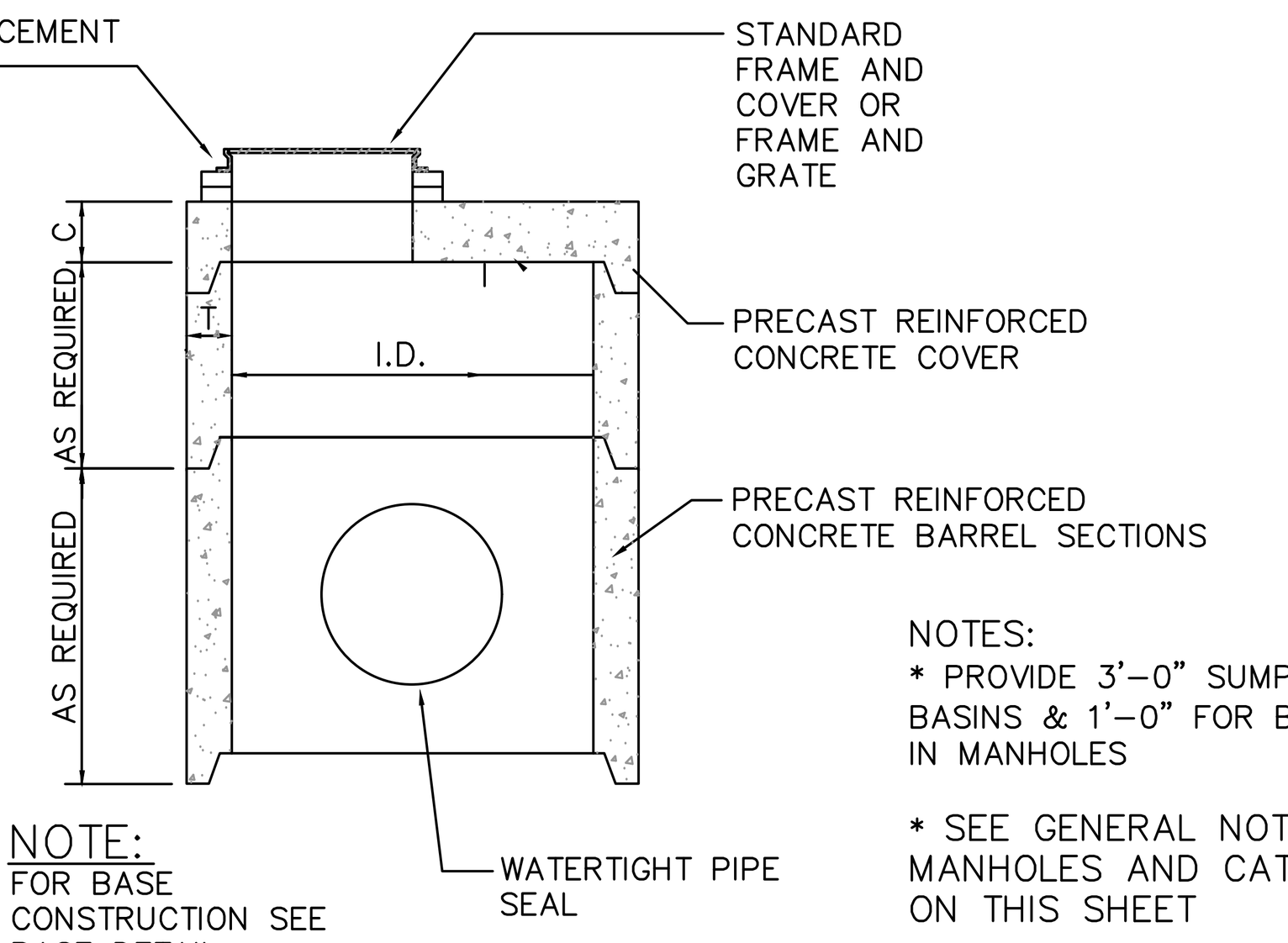
ISSUED FOR BID - NOT FOR CONSTRUCTION

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Drawings\Civil\0232277.00 C20X.dwg, Jul 31, 2020 - 9:37am

DESIGN NOTES:

1. ALL CONCRETE TO HAVE A MIN. 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS PER ASTM-C478 SPECIFICATIONS
2. DESIGN FOR H-20 WHEEL LOADING
3. REINFORCE TO .12 IN. SQ./L.F.
4. CATCH BASIN FRAMES AND COVER AND INLET STONE SHALL MATCH DETAIL FOR PRECAST CONCRETE CATCH BASIN TYPE 'E'.

I.D	C	T
5'	8"	6"
6'	9"	7"
8'	10"	8"

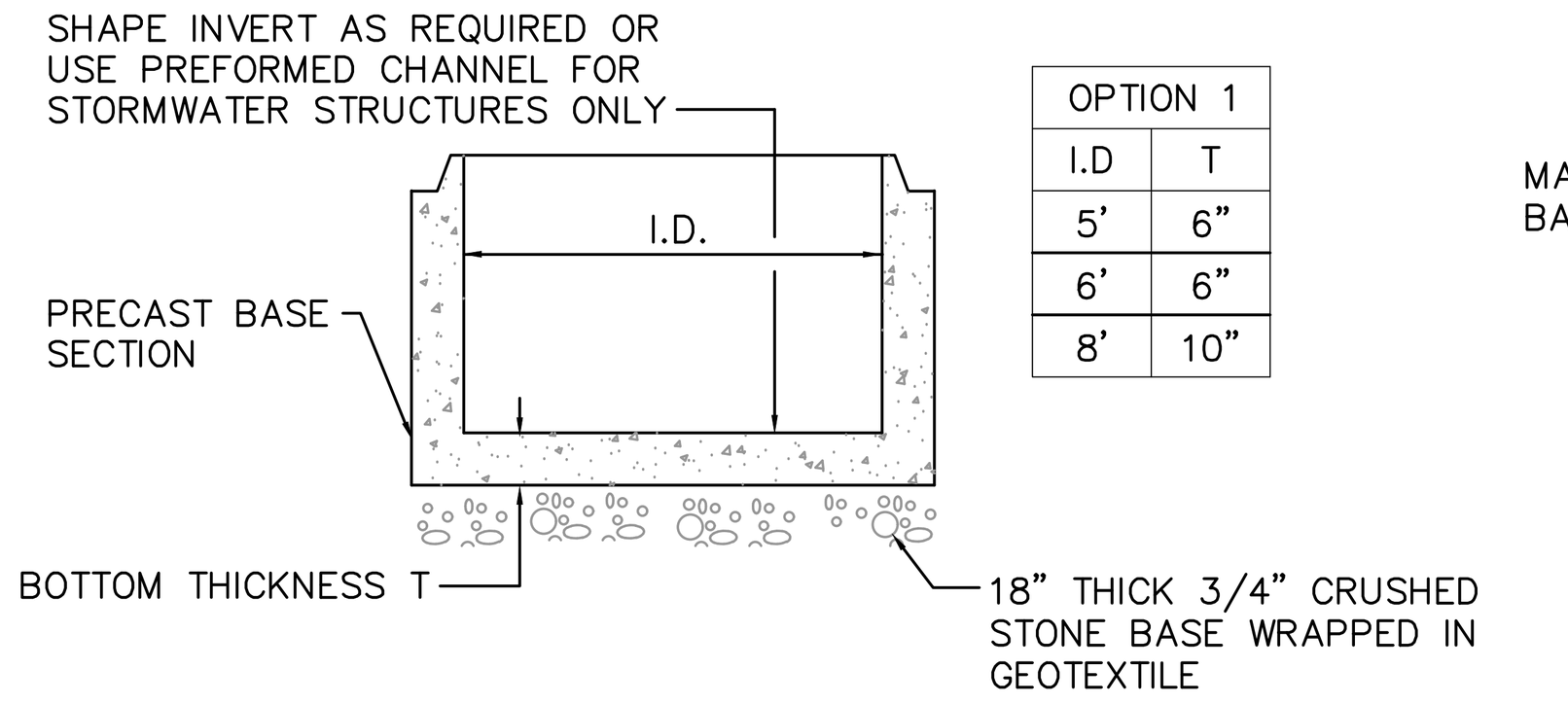


NOTE:
FOR BASE CONSTRUCTION SEE BASE DETAIL

NOTES:
* PROVIDE 3'-0" SUMP FOR CATCH BASINS & 1'-0" FOR BRICK CHANNEL IN MANHOLES

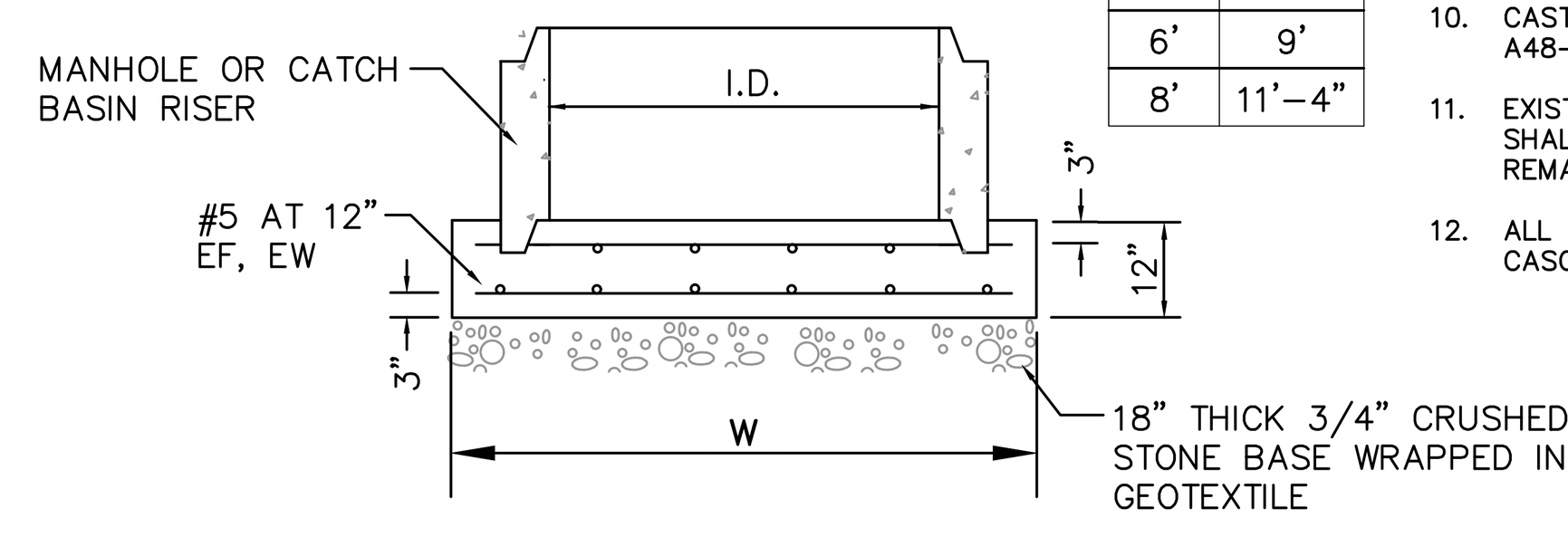
* SEE GENERAL NOTES FOR MANHOLES AND CATCH BASINS ON THIS SHEET

OPTION 1	
I.D	T
5'	6"
6'	6"
8'	10"



BASE DETAIL OPTION 1

OPTION 2	
I.D	W
5'	9'
6'	9'
8'	11'-4"



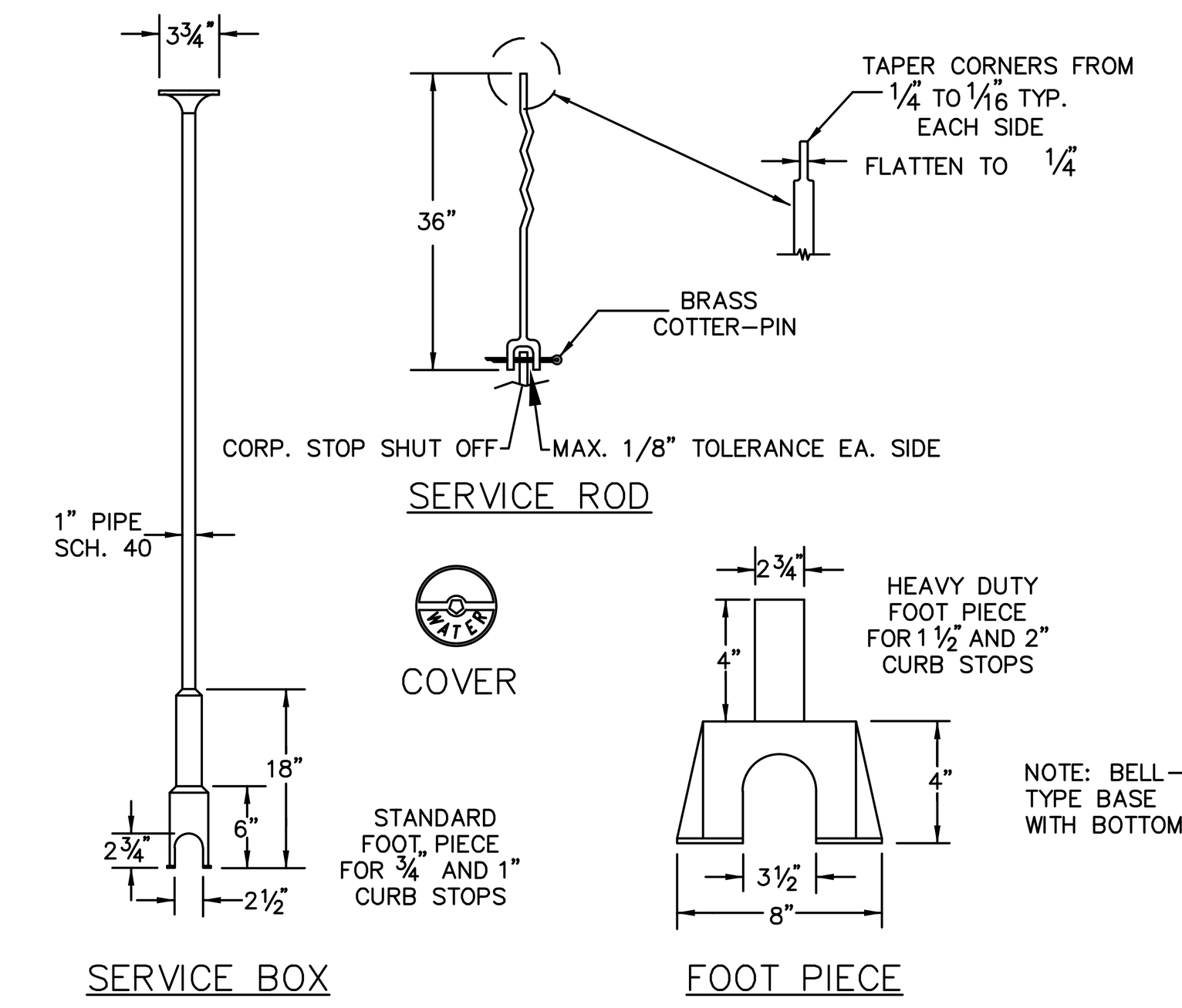
BASE DETAIL OPTION 2

LARGE DIAMETER STORM DRAIN MANHOLE AND CATCH BASIN WITH FLAT TOP

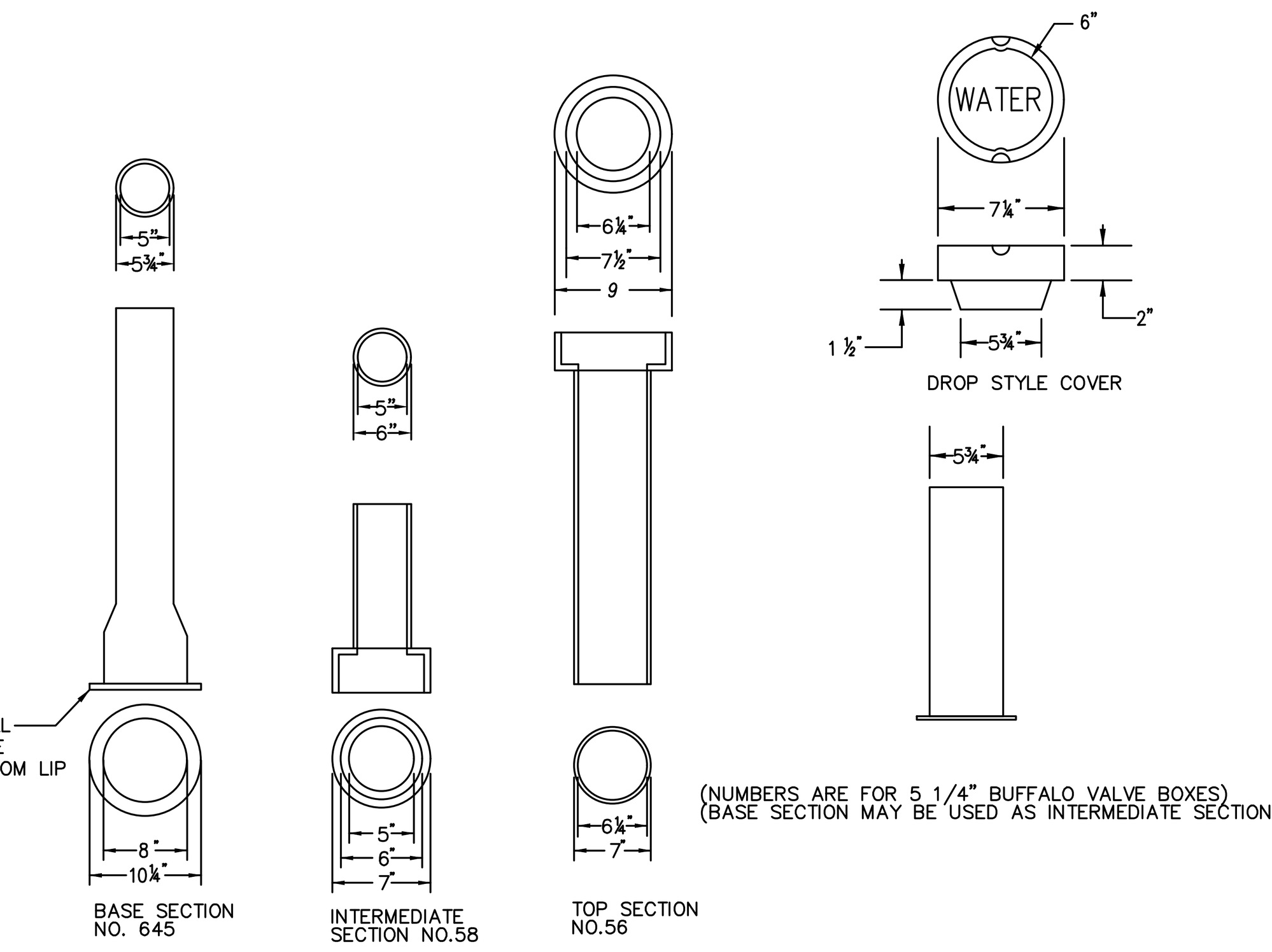
N.T.S.

GENERAL NOTES FOR MANHOLES AND CATCH BASINS

1. ALL CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 lbs. PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. MANHOLES MAY BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE, OR CAST IN PLACE.
3. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPEC. C-478.
4. ALL STORM AND SEWER MANHOLE COVERS SHALL BE SOLID AND SHALL HAVE ONE 7/8" DIAMETER DRILLED PICK HOLE LOCATED 8" FROM THE CENTER OF THE COVER.
5. ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER/DRAIN MANHOLE COVERS SHALL HAVE "DRAIN" CAST INTO THE COVER.
6. ALL MANHOLE RISERS SHALL BE ETHERIDGE 24" OR APPROVED EQUAL.
7. SEWER BRICK SHALL CONFORM TO ASTM SPEC. DESIGNATE ON C-32-63, GRADE MA AND SA.
8. ALL SANITARY MANHOLES SHALL HAVE A WATERPROOFING COATING APPLIED TO THE EXTERIOR SURFACE.
9. CATCH BASIN FRAMES FOR TYPE A4 CATCH BASIN CURB INLETS SHALL BE ETHERIDGE DR5A OR APPROVED EQUAL.
10. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35.
11. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.
12. ALL CATCH BASIN OUTLETS SHALL BE INSTALLED WITH A CASCO TRAP. SEE FIGURE II-09.

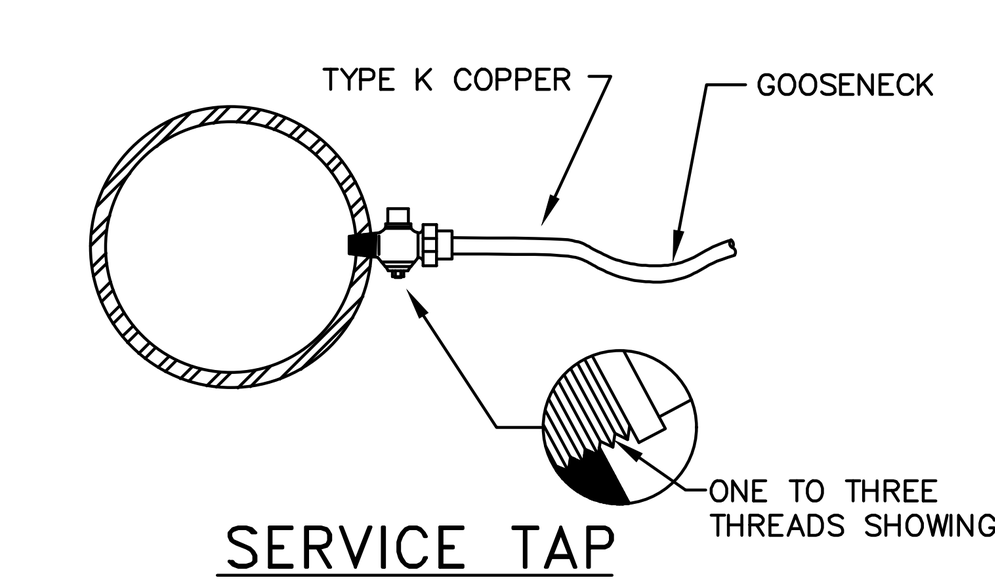


NOTE : ANY EXTENSION OF SERVICE BOX REQUIRES:
1) 1" FEMALE IRON PIPE COUPLING
2) 1" THREADED PIPE
(THIS IS TO BE A NON-WELDED, TWO PIECE ARRANGEMENT. SLIP ON ADAPTERS ARE NOT PERMISSIBLE.)

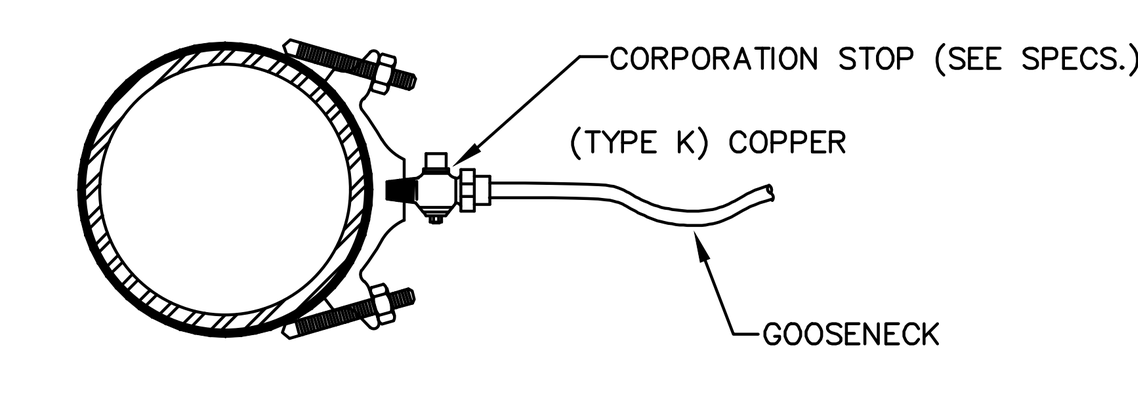


VALVE BOX & COVER

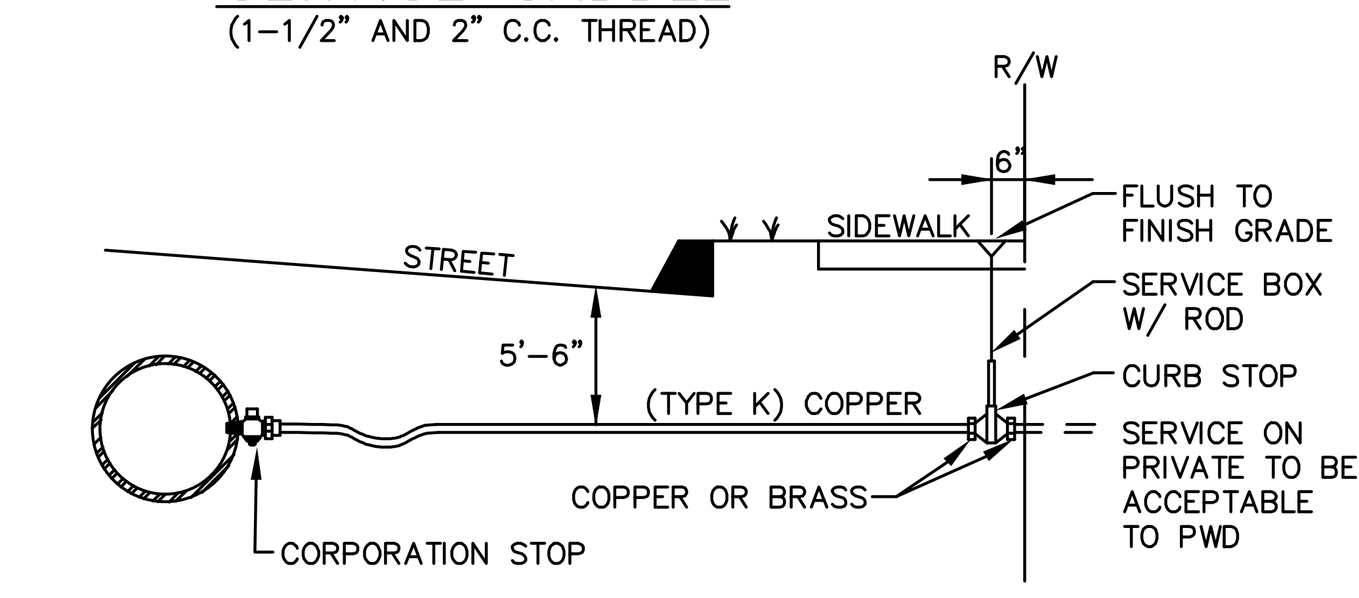
N.T.S.



SERVICE TAP
(3/4" AND 1" C.C. THREAD)



SERVICE SADDLE
(1-1/2" AND 2" C.C. THREAD)

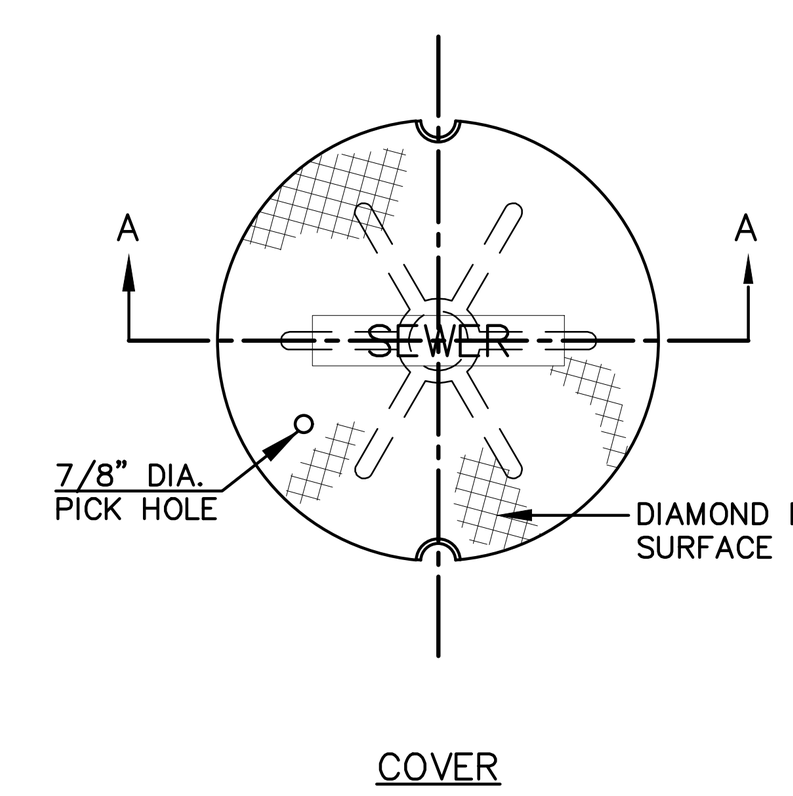


TYPICAL SERVICE CONNECTION

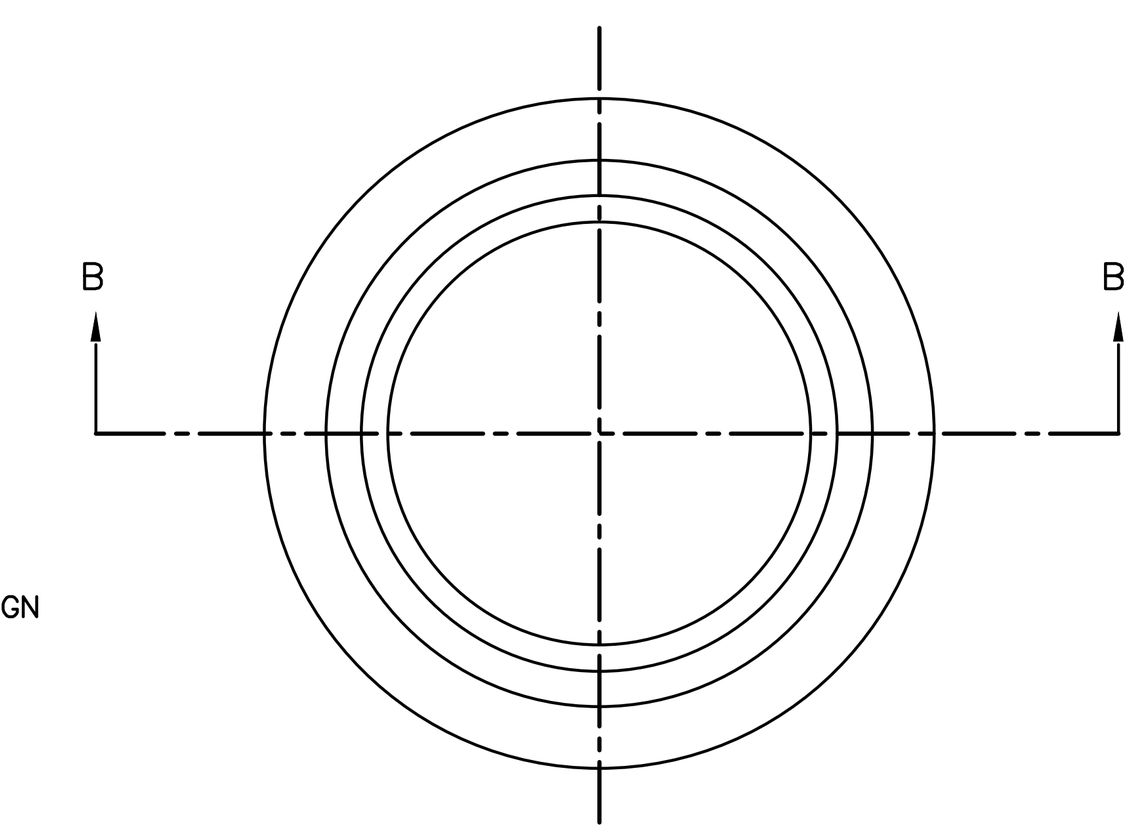
N.T.S.

NOTE:
ALL MANHOLE COVERS SHALL BE SOLID AND SHALL HAVE ONE 7/8" DIAMETER DRILLED PICK HOLE, LOCATED 8" FROM THE CENTER OF THE COVER.

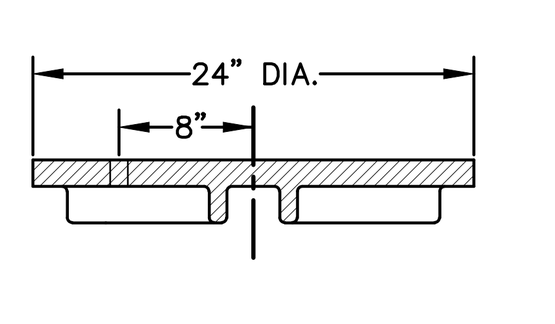
ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER/DRAIN MANHOLE COVERS SHALL HAVE "DRAIN" CAST INTO THE COVER.



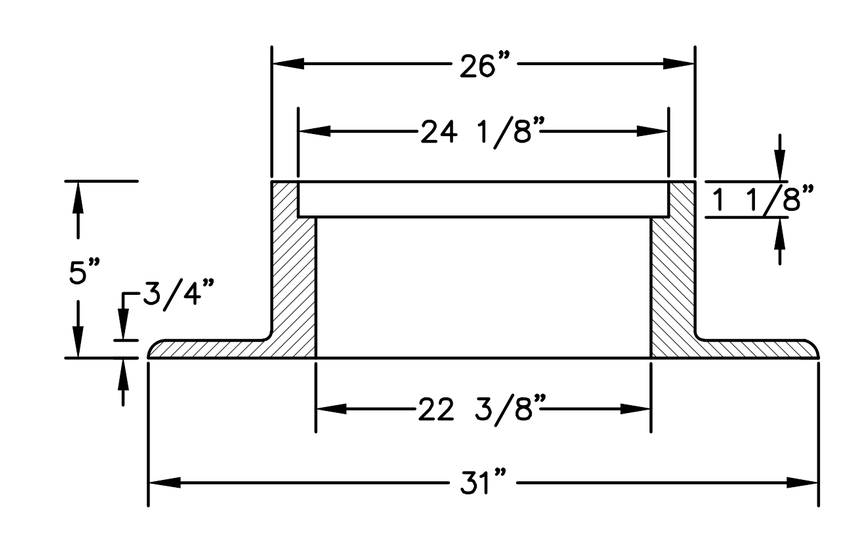
COVER
PLAN VIEW



FRAME
PLAN VIEW



SECTION A – A
COVER

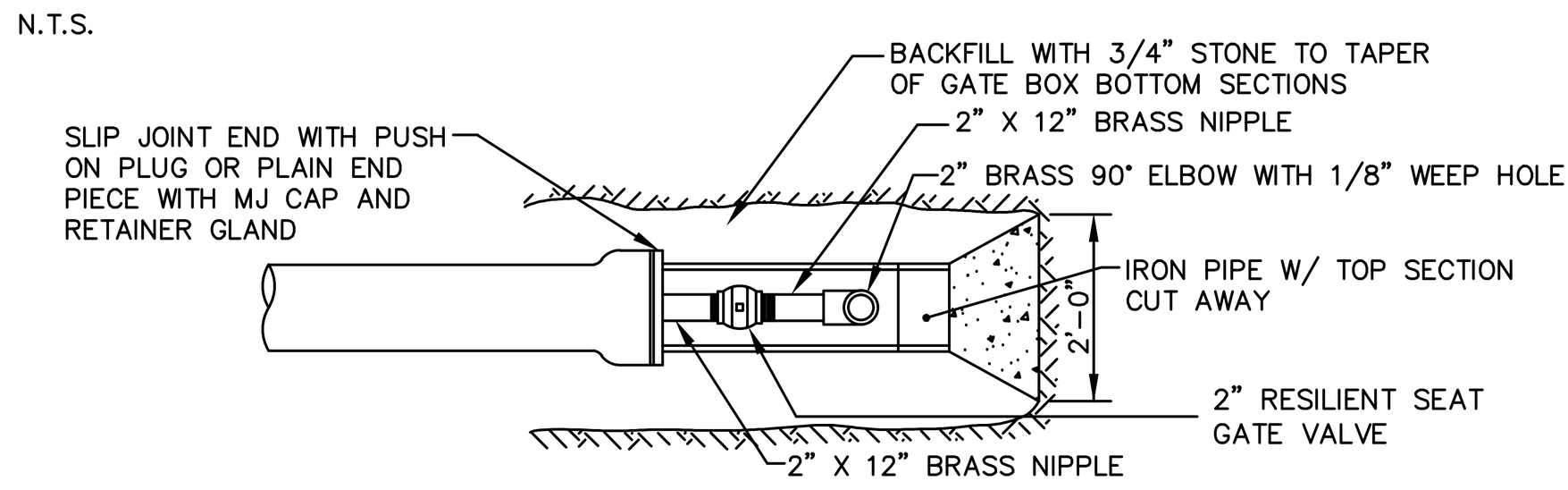


MIN. WGT. 320 LBS.

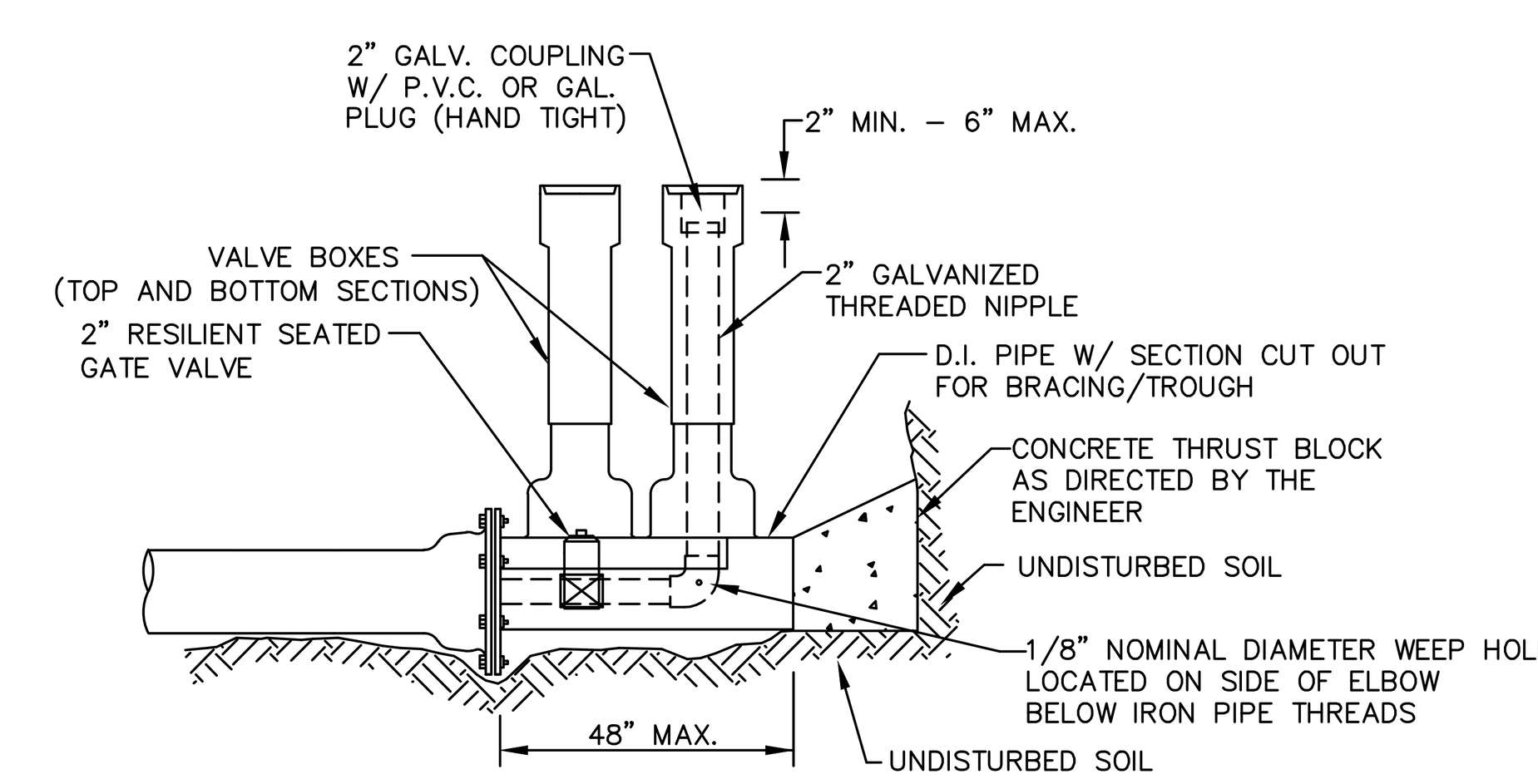
SECTION B – B
FRAME

CAST IRON MANHOLE COVER AND FRAME

N.T.S.

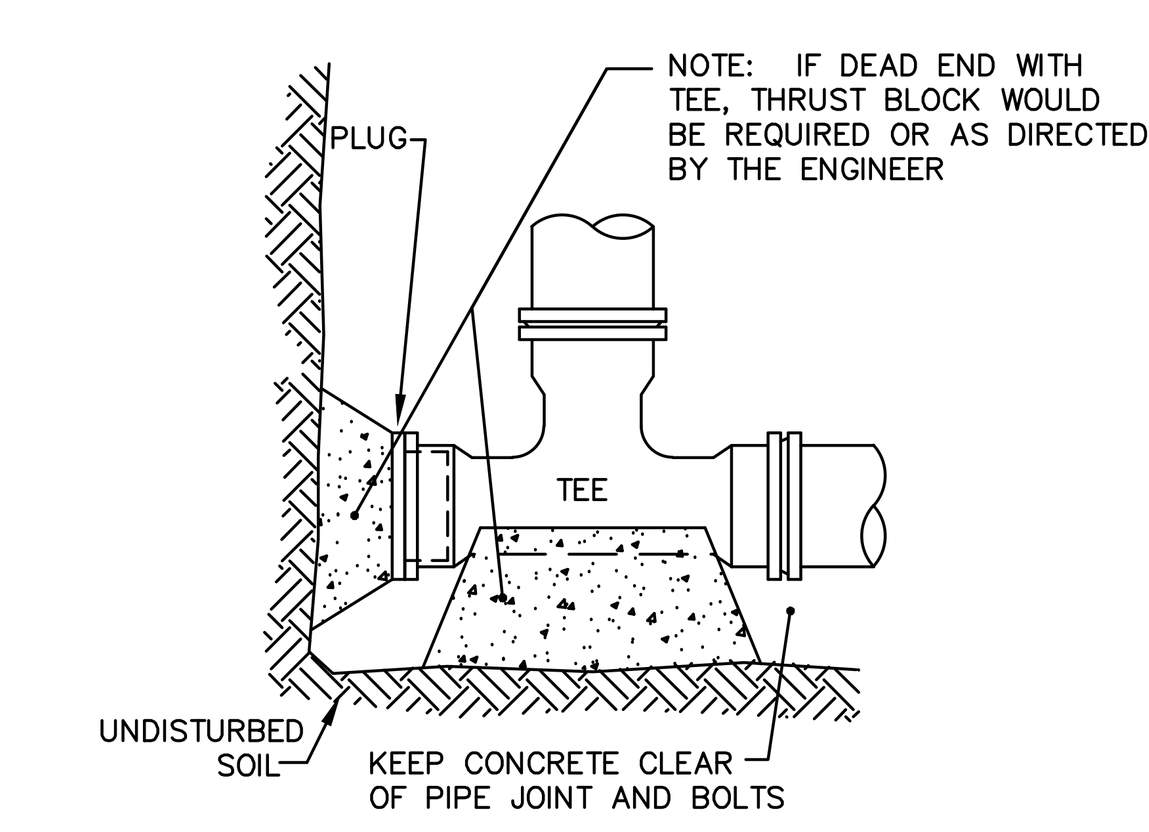


TOP VIEW



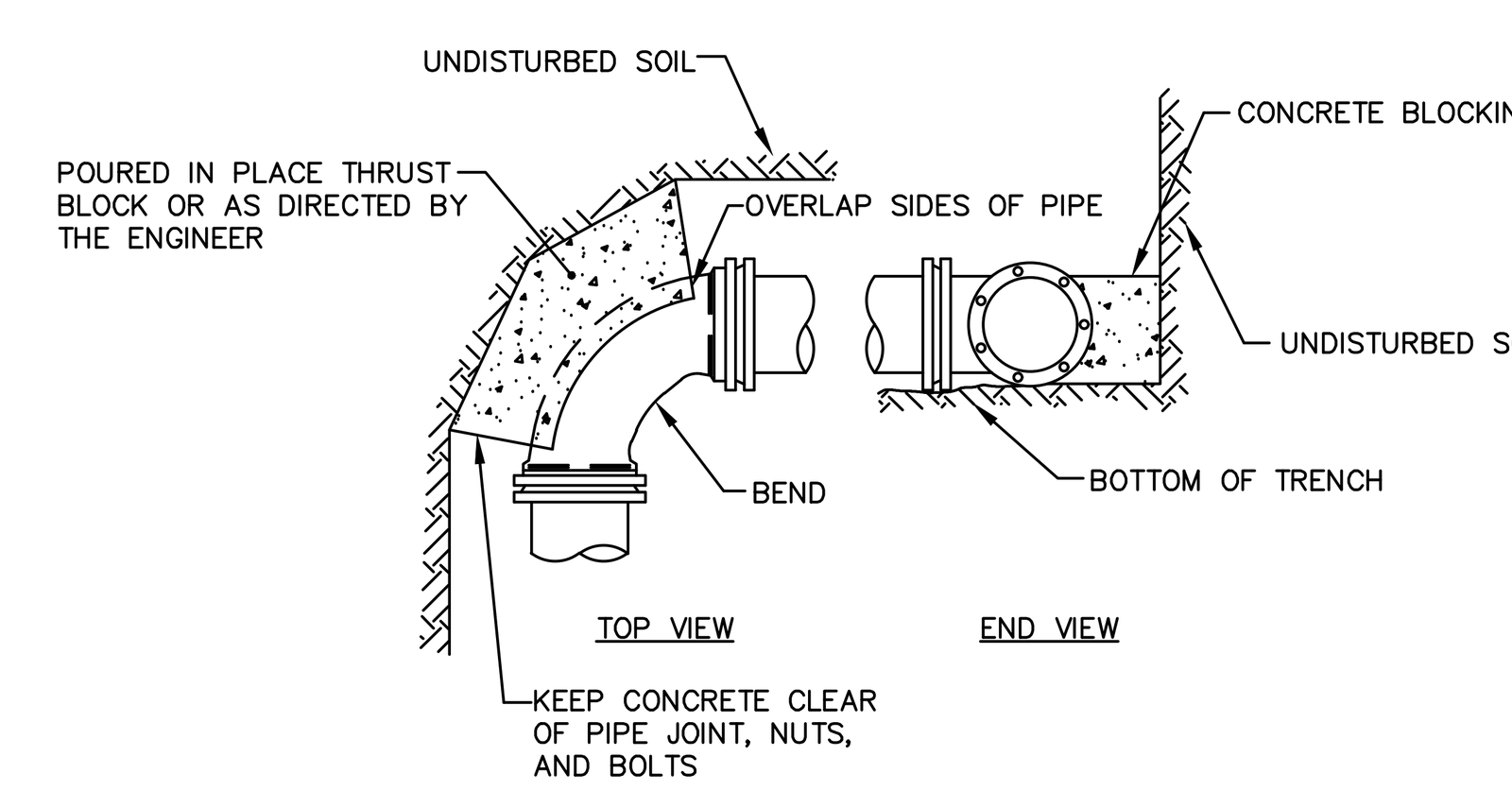
STANDARD 2" BLOW OFF

N.T.S.



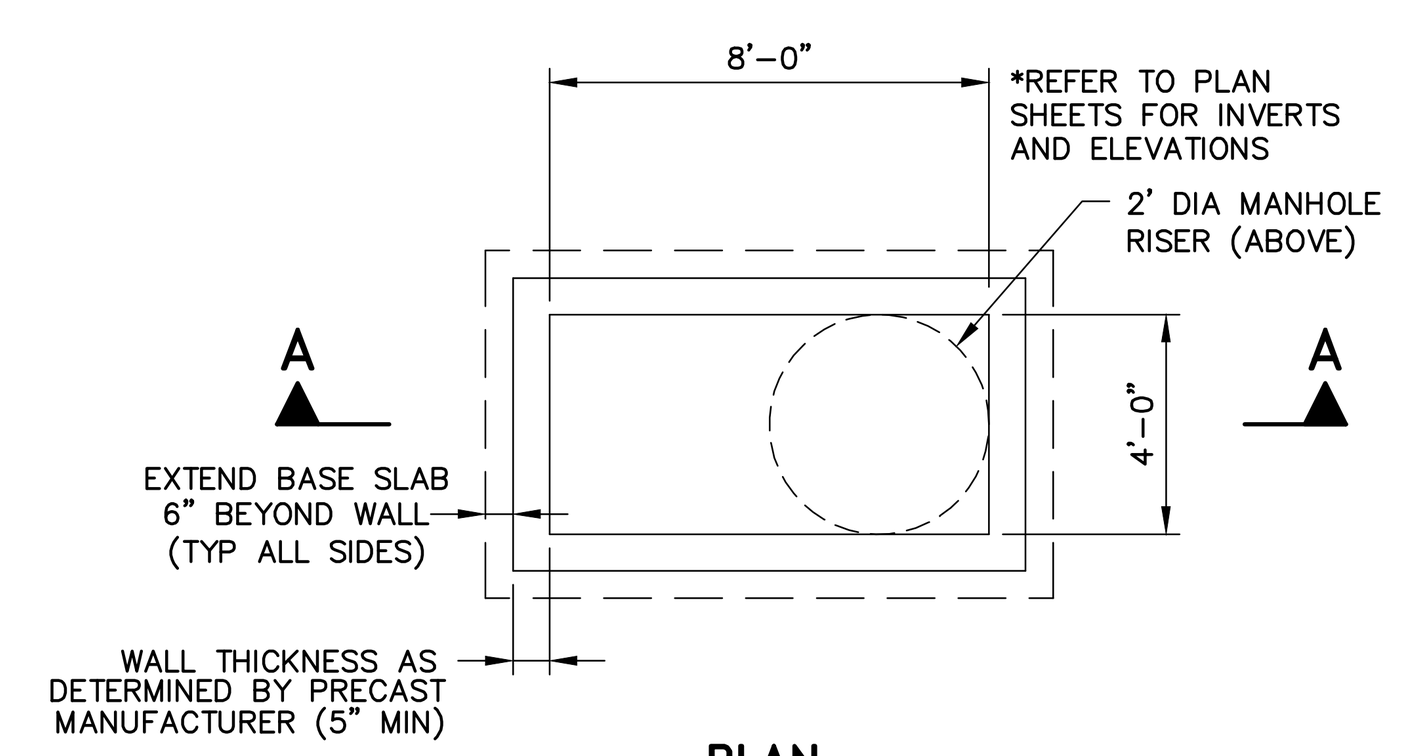
STANDARD TEE BLOCKING

N.T.S.

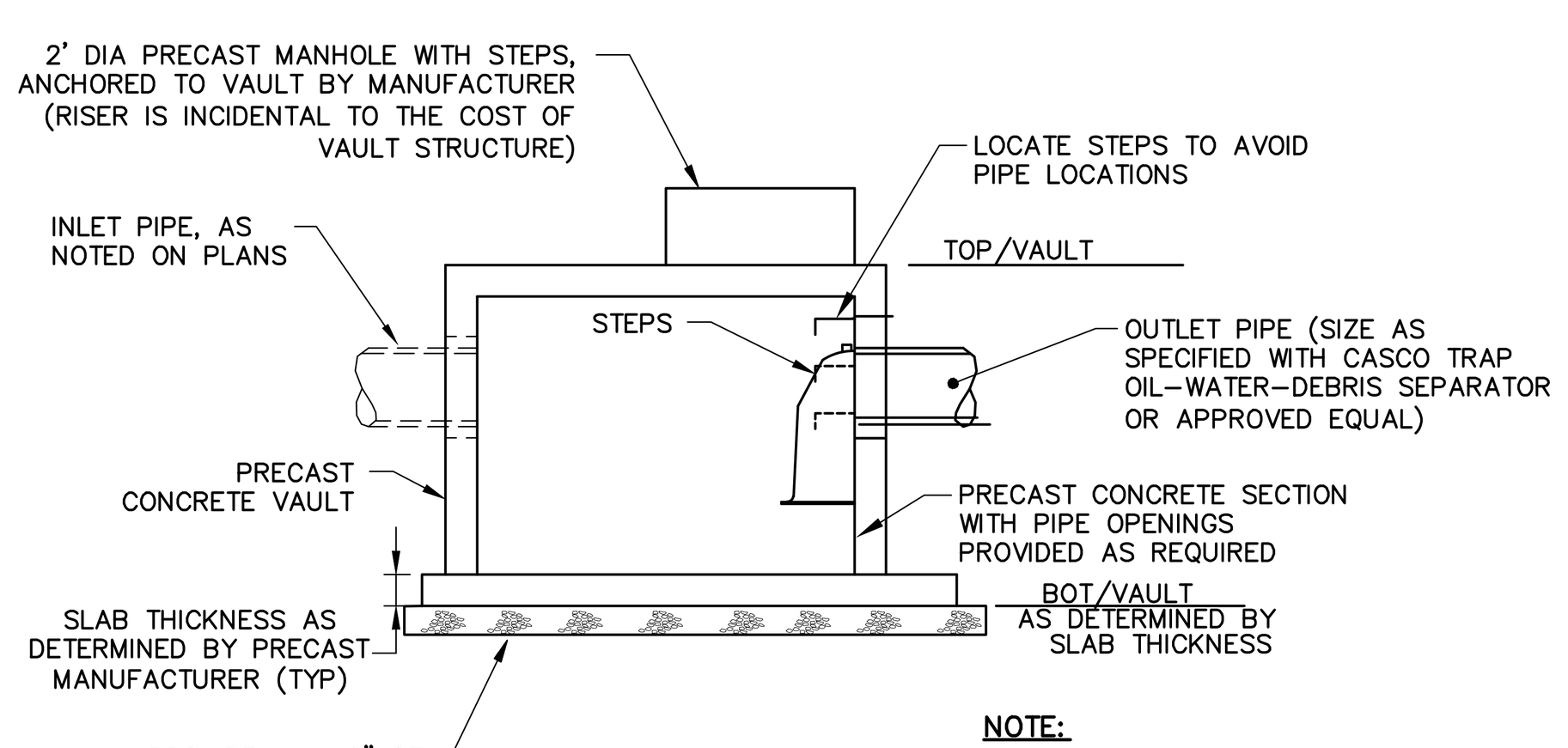


STANDARD BEND BLOCKING

N.T.S.



PLAN

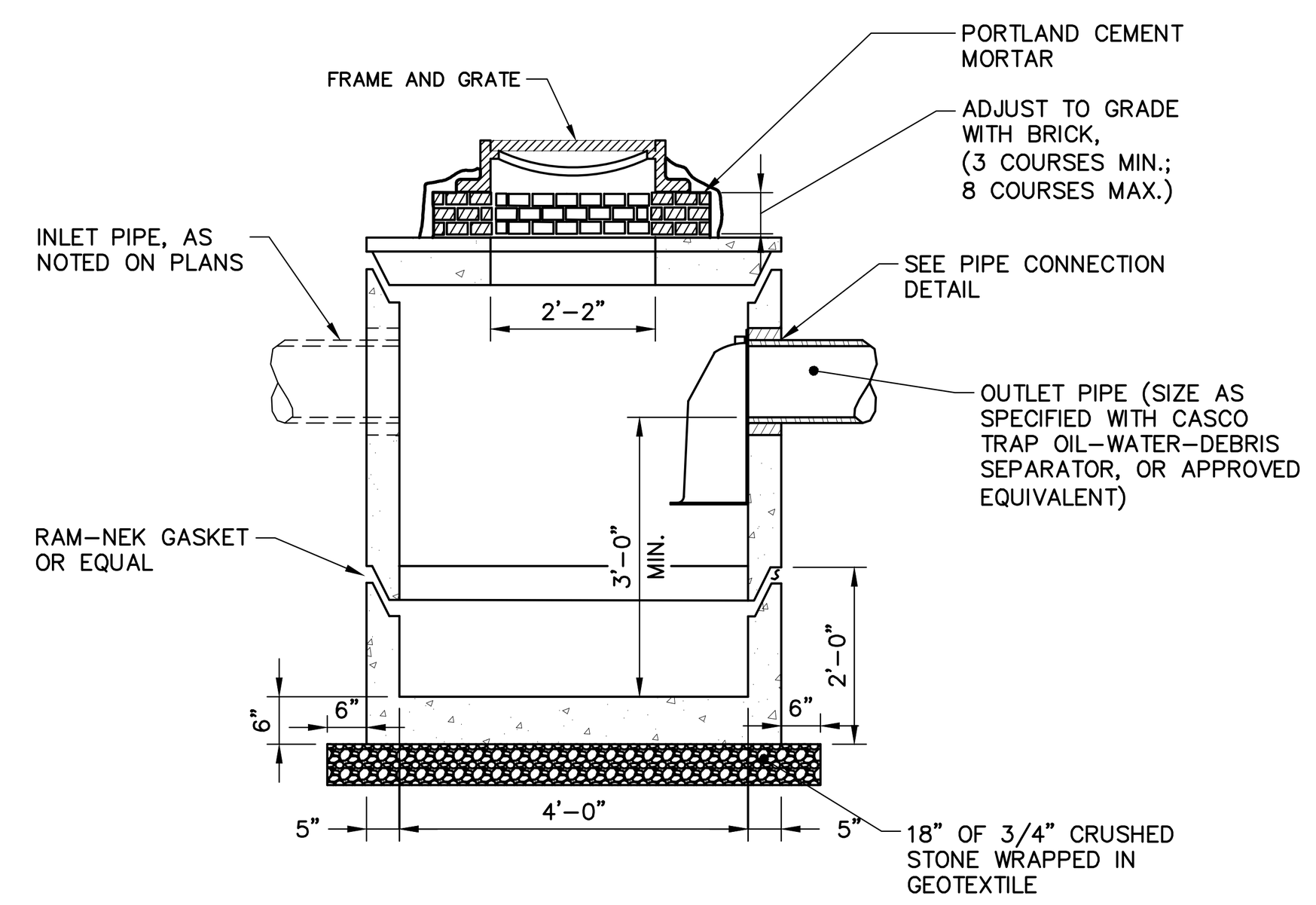


SECTION A–A

NOTE:
REINFORCING STEEL SHALL MEET THE AMERICAN IRON AND STEEL REQUIREMENTS.

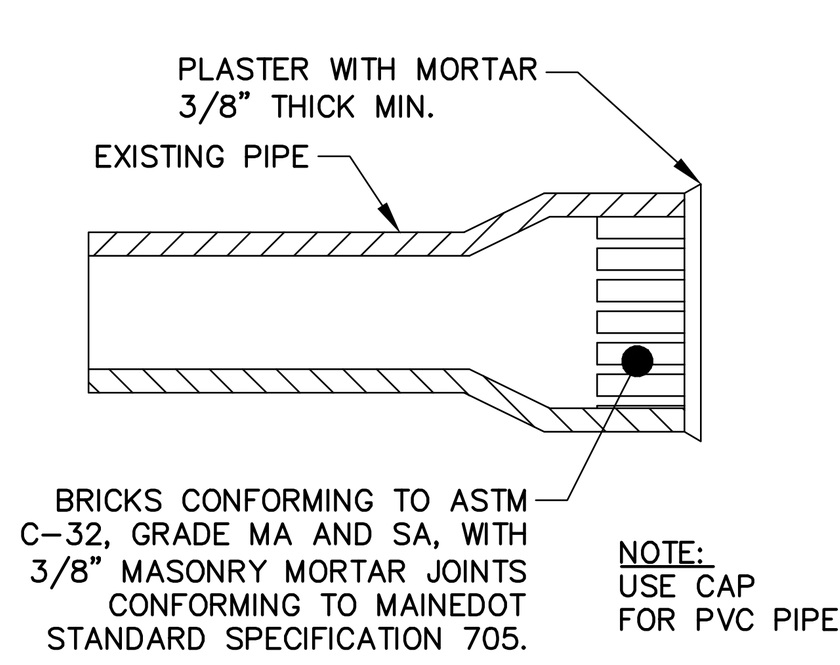
PRECAST 8'X4' CONCRETE VAULT

N.T.S.



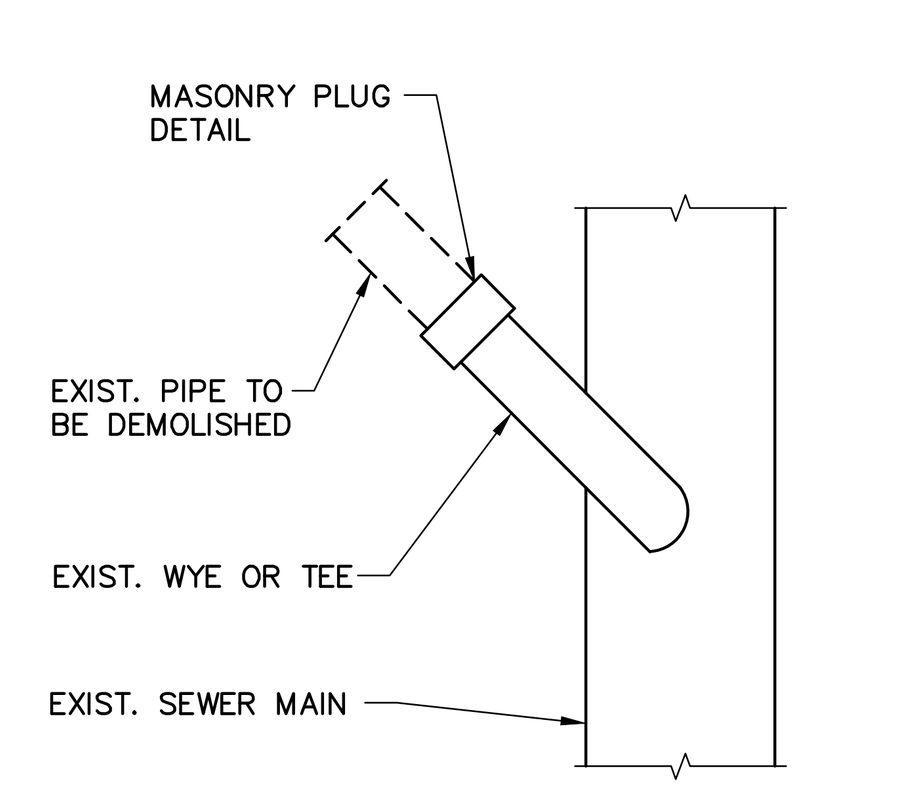
PRECAST CONCRETE CATCH BASIN

N.T.S.



MASONRY PLUG DETAIL

N.T.S.

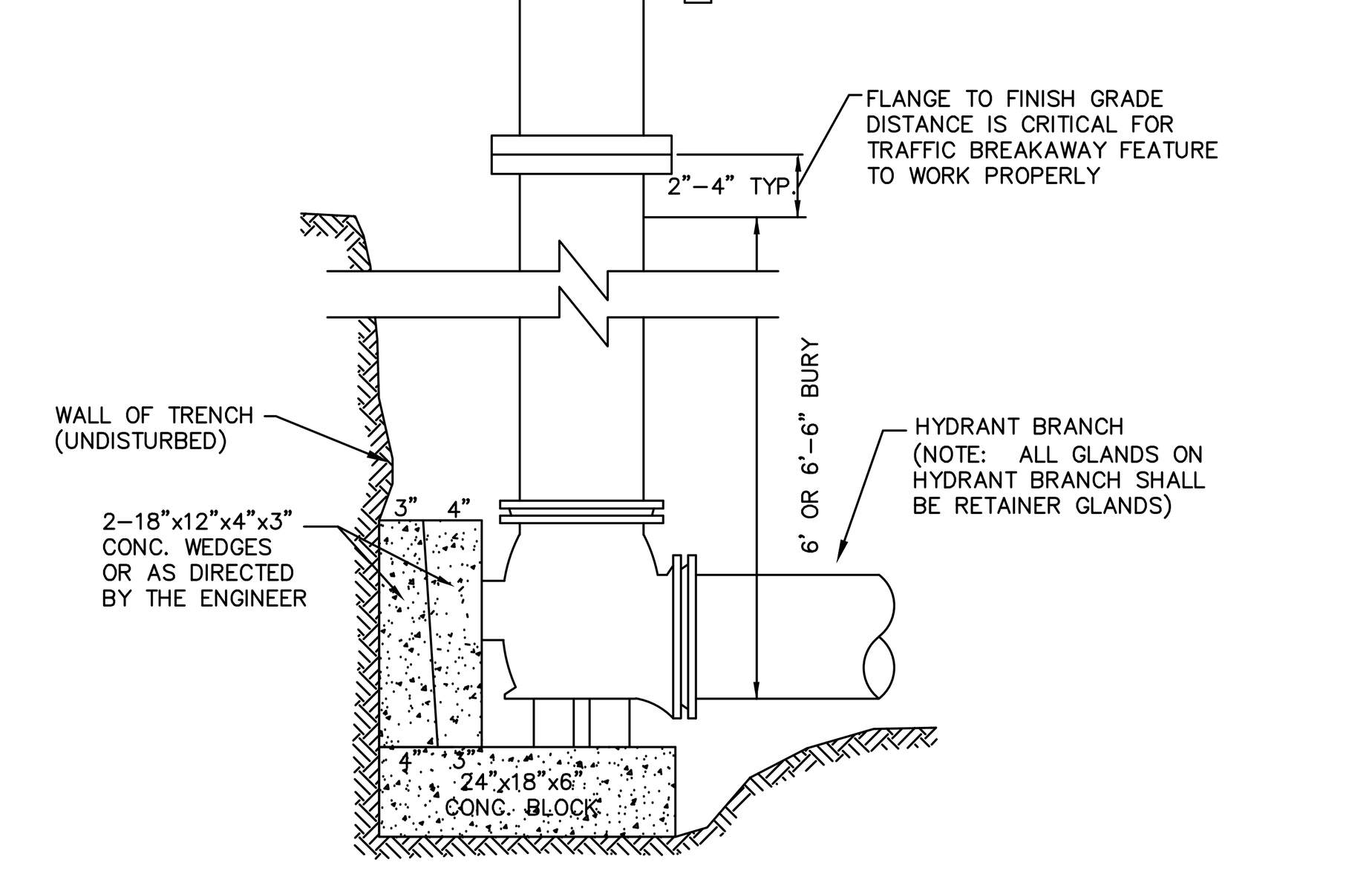


MASONRY PLUG @ MAIN

N.T.S.

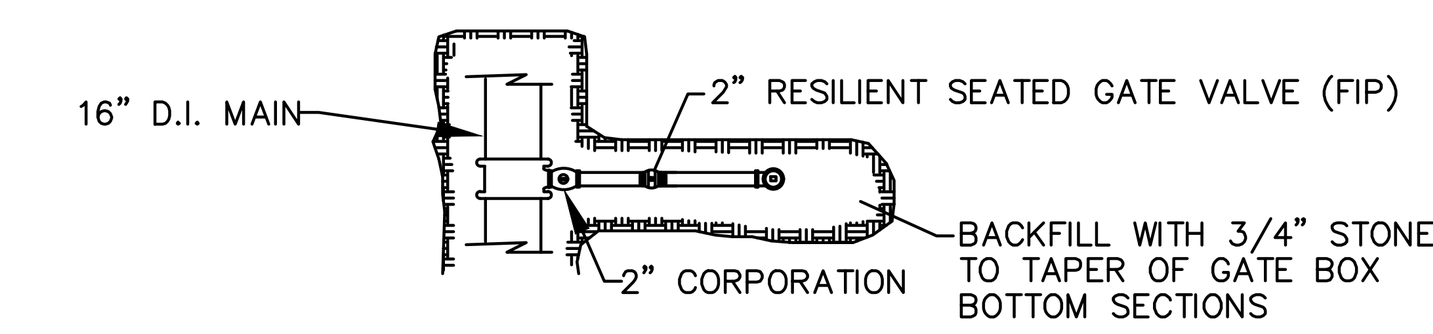
FOR STATE ROADS
SETBACK SHALL CONFORM TO M.D.O.T. POLICY FOR ABOVE GROUND UTILITY LOCATIONS. FOR SPEED LIMITS >35MPH 6 1/2' FROM EDGE OF SHOULDER OR FACE OF CURB. FOR SPEED LIMITS <35MPH 3' FROM EDGE OF SHOULDER OR 1' FROM FACE OF CURB.

FOR CITY OR TOWN ROADS
CHECK WITH MUNICIPALITY FOR REQUIREMENTS

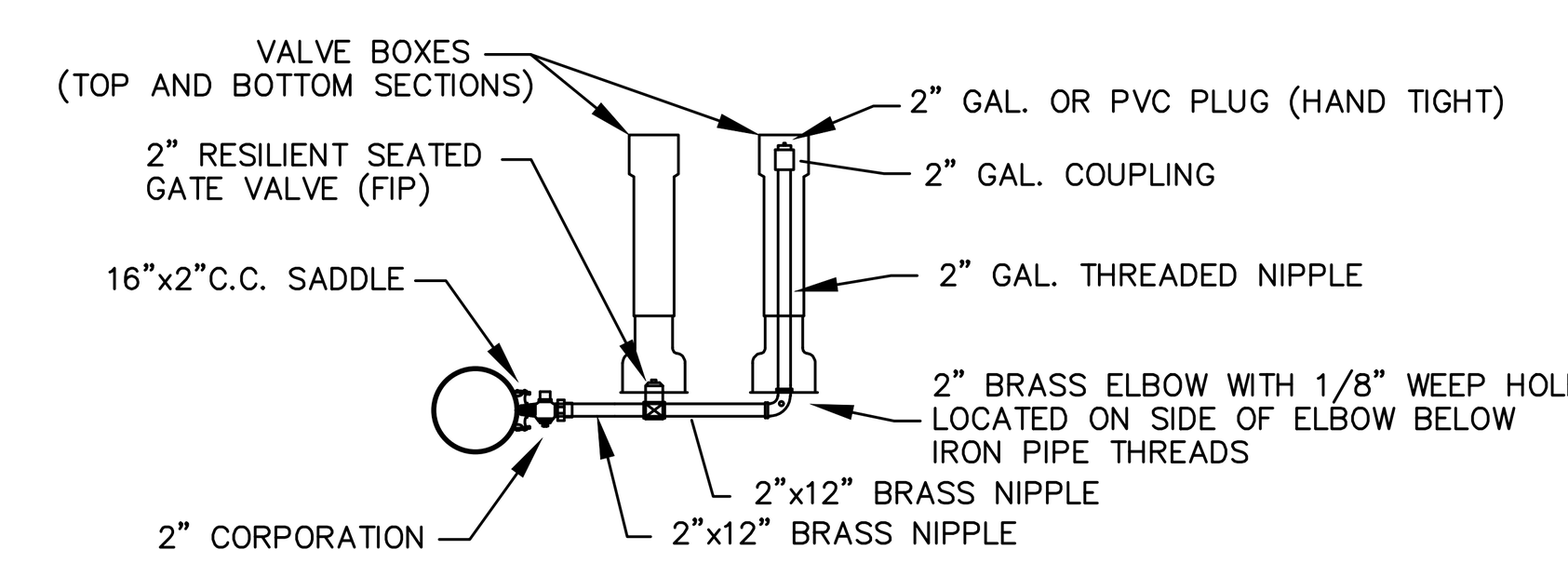


TYPICAL HYDRANT INSTALLATION DETAIL

N.T.S.



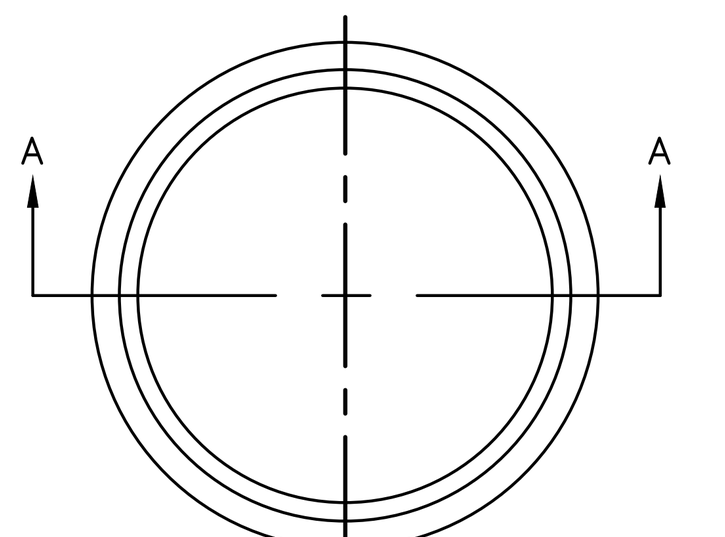
TOP VIEW



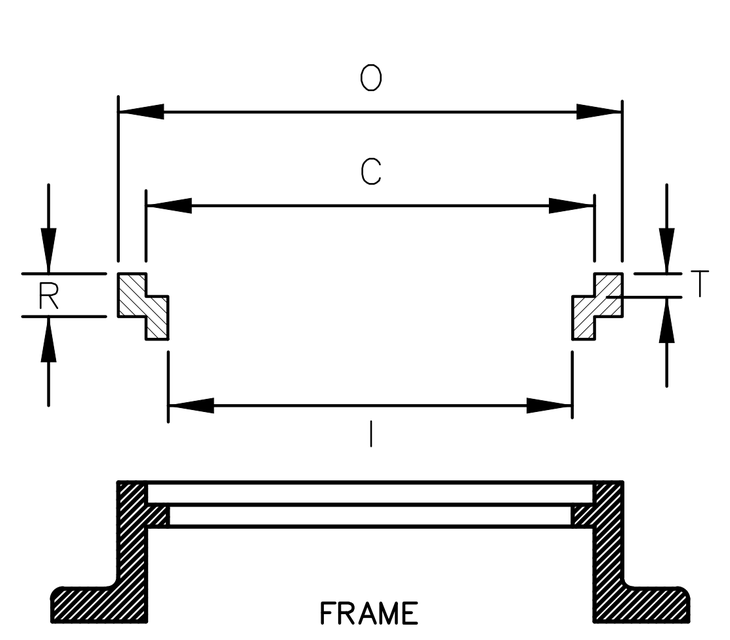
SIDE VIEW

SIDE-ARM BLOW-OFF 4" & LARGER MAINS

N.T.S.



PLAN VIEW

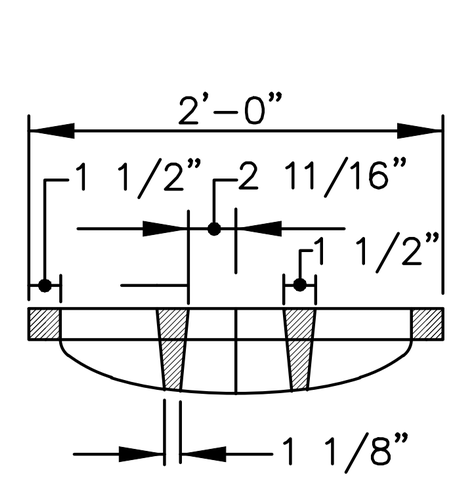


SECTION A–A

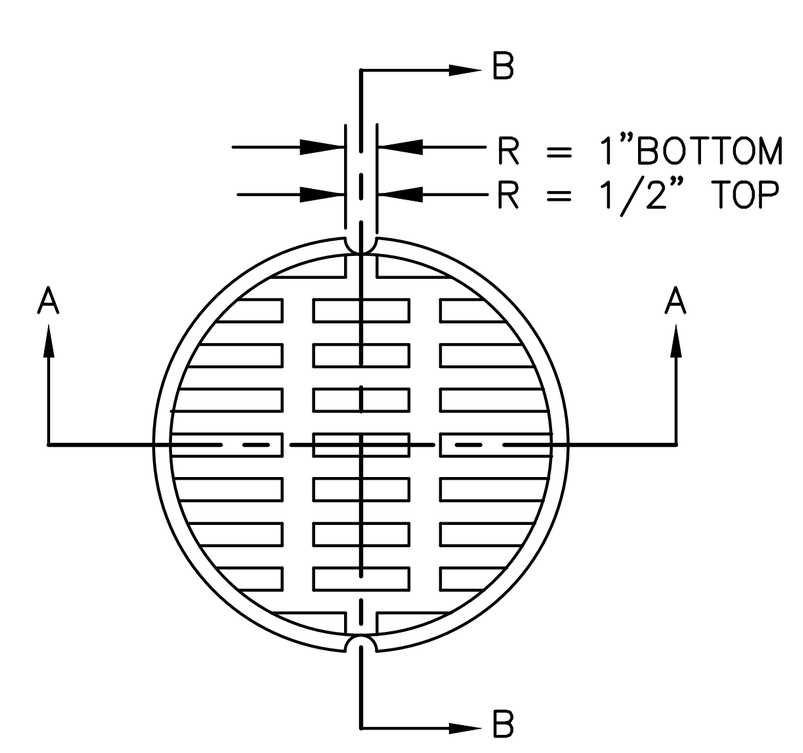
SIZE	C	R	T	O	I	Wt.
R241 1/2	24	1 1/2	1 1/8	26 1/4	22 1/2	60
R242	24	2	1 1/8	26 1/4	22 1/2	80
R242 1/2	24	2 1/2	1 1/8	26 1/4	22	100
R243	24	3	1 1/8	26 1/4	22	120

MANHOLE RISER RING

N.T.S.

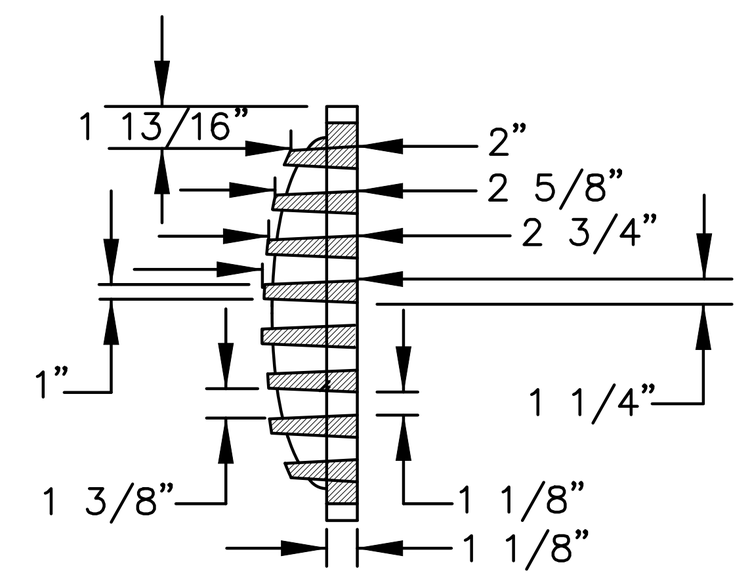


SECTION A–A

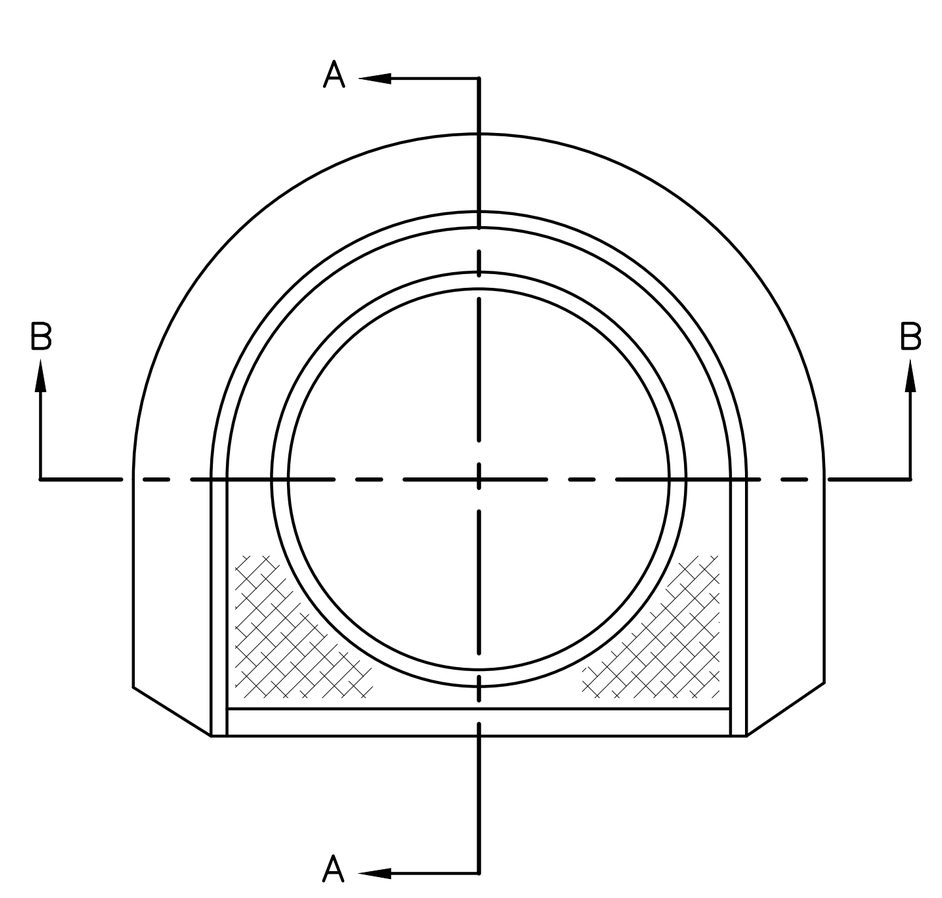


PLAN VIEW

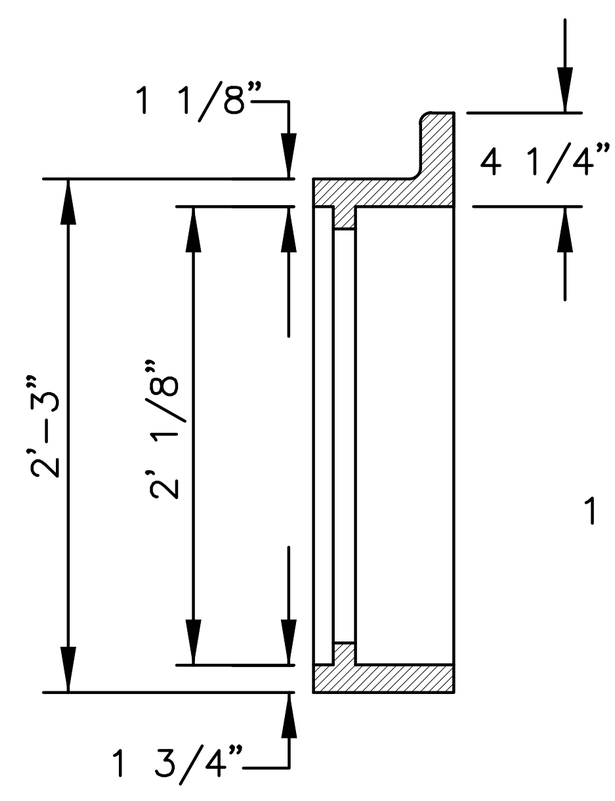
GRATE DETAIL



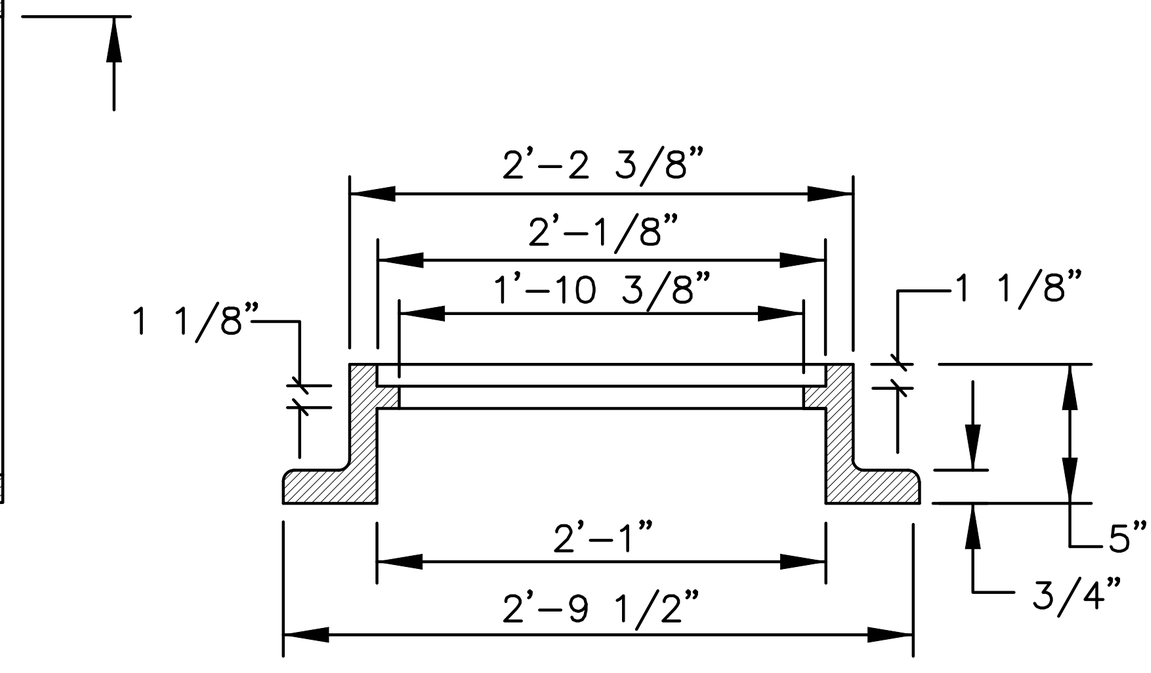
SECTION B–B



PLAN VIEW



SECTION A–A

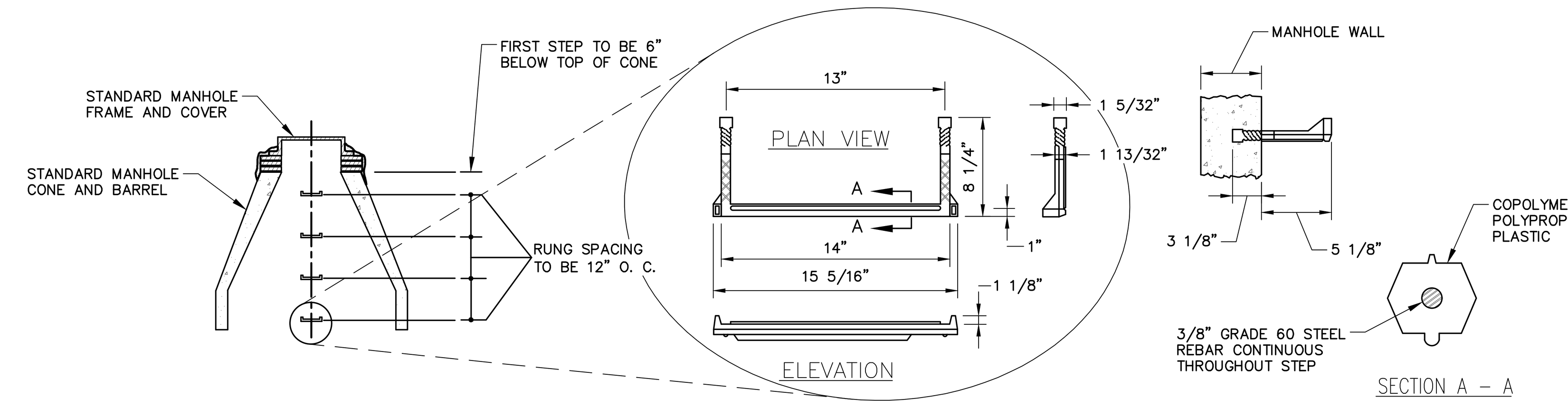


SECTION B–B

FRAME DETAIL

CATCH BASIN FRAME & GRATE

N.T.S.



PLASTIC MANHOLE STEPS

N.T.S.

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STATE OF MAINE ★ DARRIN B. STAIRS No. 15118 LICENSED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
C	ISSUED FOR BID	5-29-2020
B	RESPONSE TO CITY COMMENTS	5-15-2020
A	BID DRAWING PROGRESS SET	3-26-20

DESIGNED BY: ANL | DRAWN BY: BCM\PF | CHECKED BY: DS

0232277.00 C20X.dwg

CIVIL DETAILS - 2

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

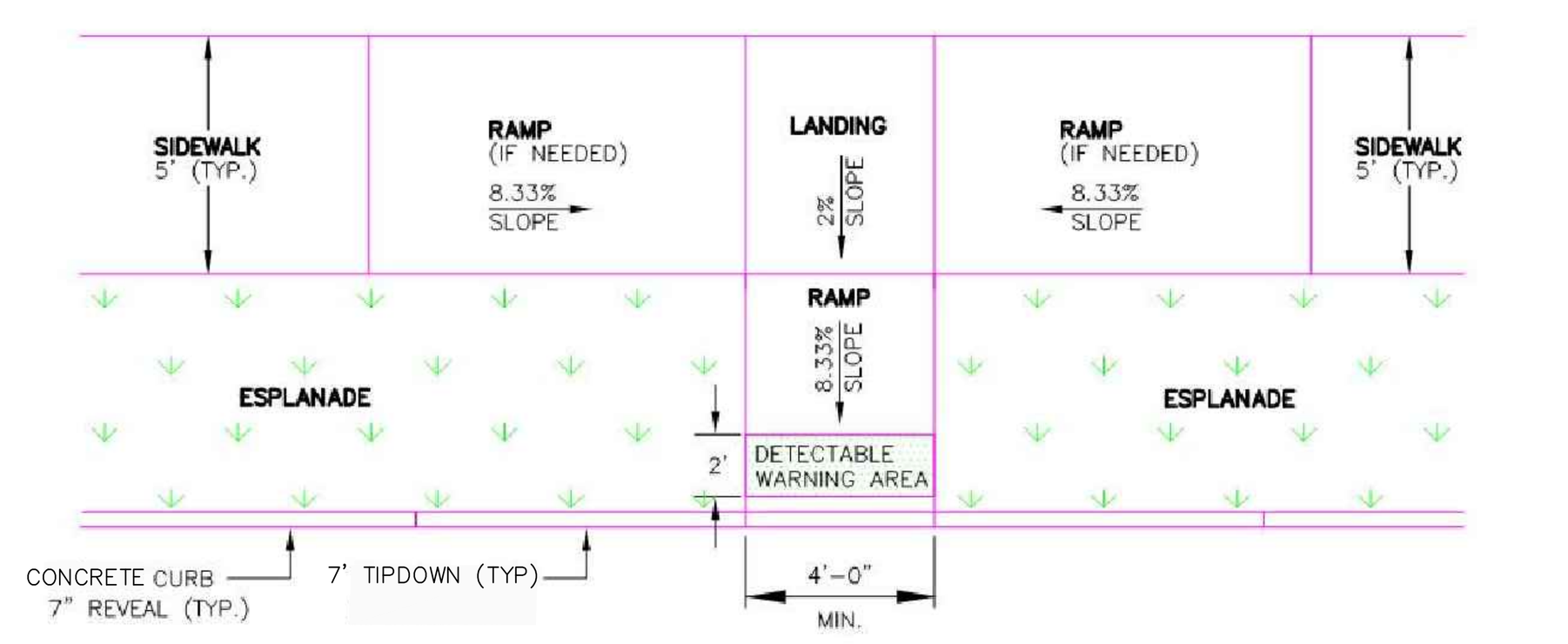
JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 8 OF --

C-201

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Drawings\Civil\0232277.00 C20X.dwg, Jul 31, 2020 – 9:36am

42x30 SHEET
1:1

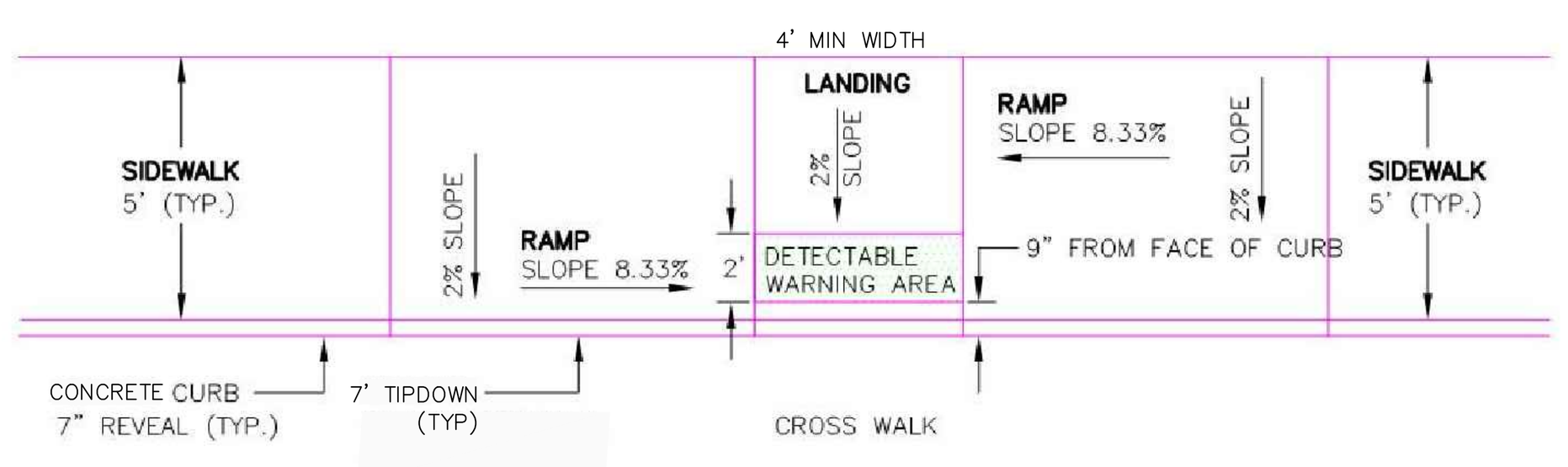
NOTES:
ALL RAMPS SHALL COMPLY WITH ADA STANDARDS.
GRANITE CURB ADJACENT TO LANDING SHALL BE FLUSH WITH STREET.
SIDEWALK MATERIAL PER CITY SIDEWALK MATERIAL POLICY.



PLAN VIEW

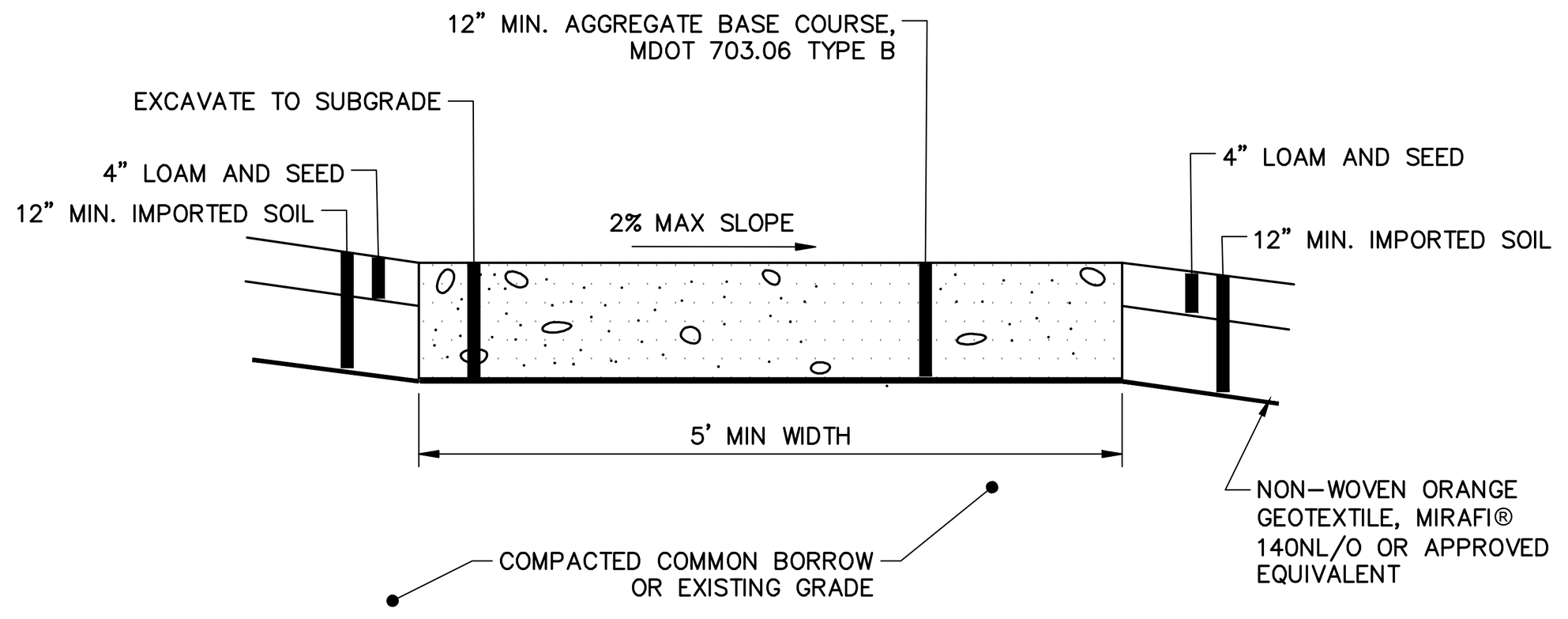
PERPENDICULAR ADA RAMP LAYOUT FOR NARROW SIDEWALK WITH ESPLANADE
NOT TO SCALE

NOTES:
ALL RAMPS SHALL COMPLY WITH ADA STANDARDS.
GRANITE CURB ADJACENT TO LANDING SHALL BE FLUSH WITH STREET.
SIDEWALK MATERIAL PER CITY SIDEWALK MATERIAL POLICY.

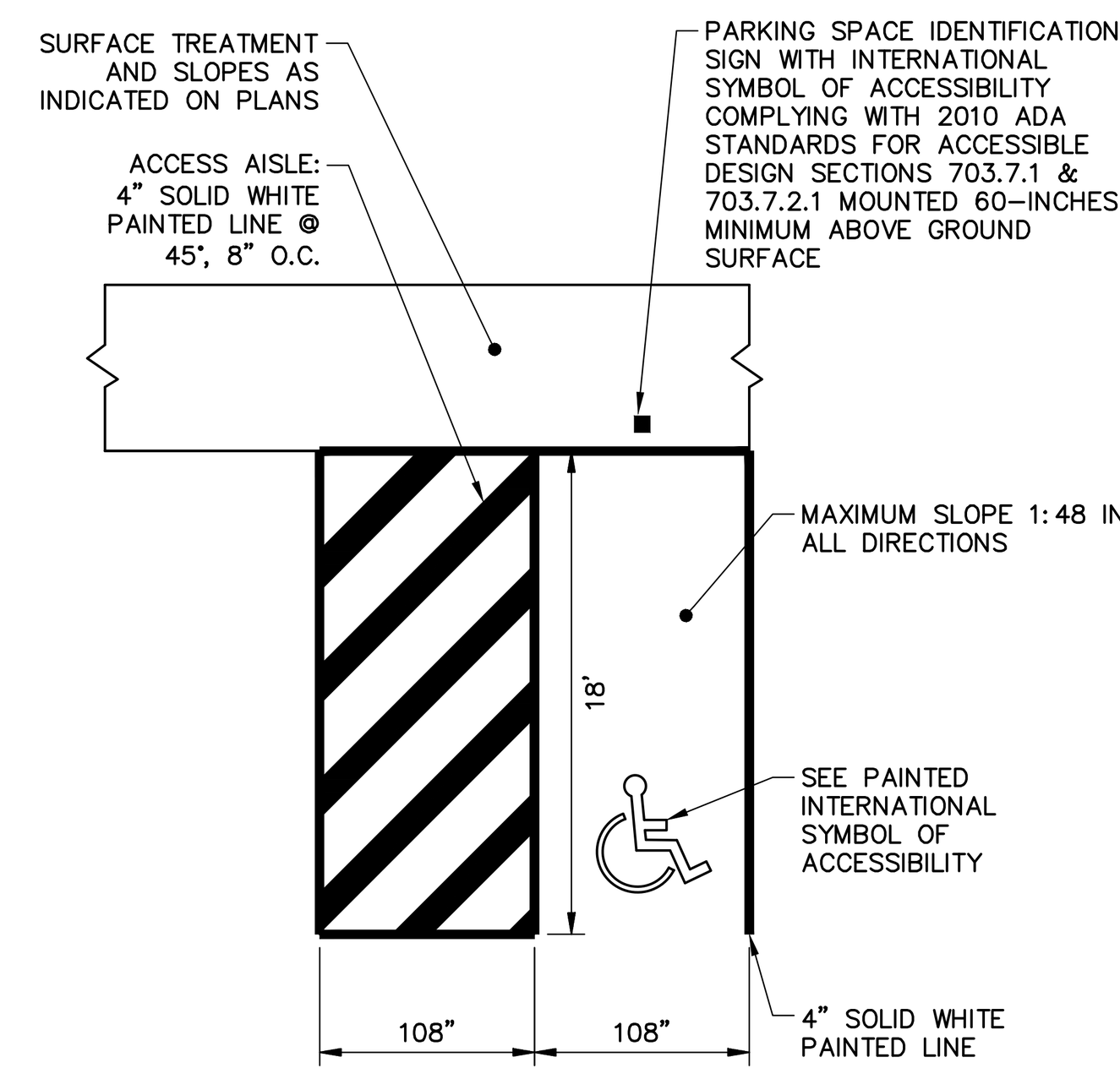


PLAN VIEW

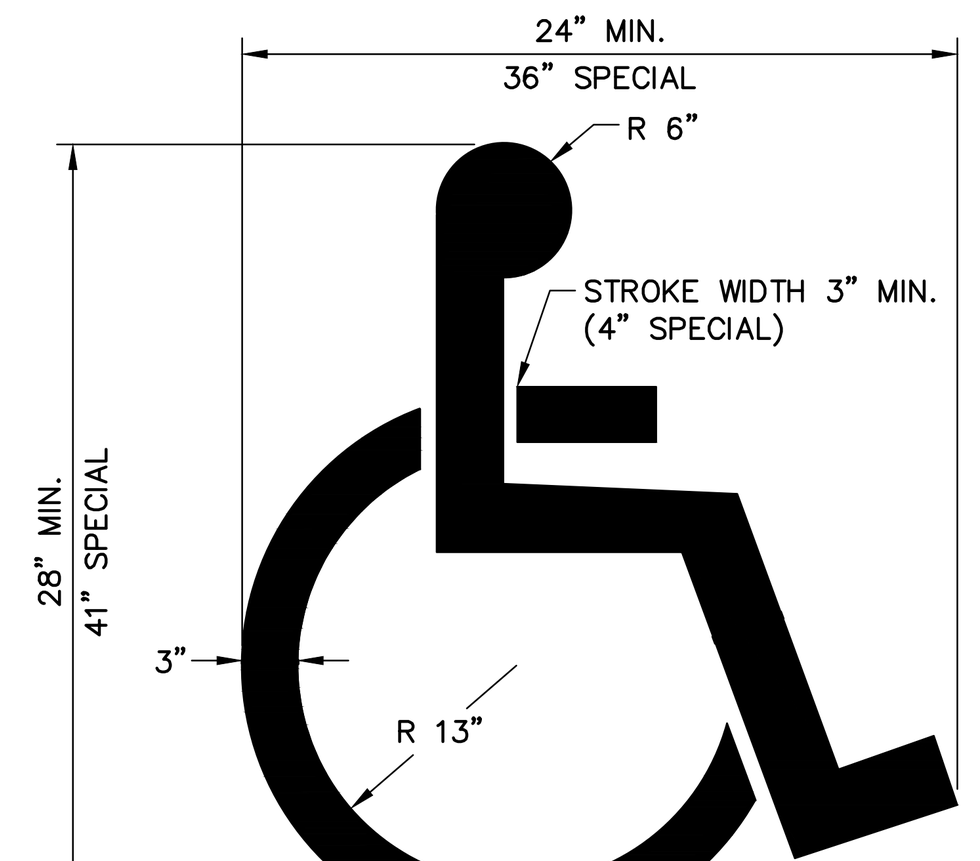
PARALLEL SIDEWALK RAMP LAYOUT FOR NARROW SIDEWALK WITH NO ESPLANADE
NOT TO SCALE



GRAVEL EMERGENCY ACCESS WALKWAY SECTION
NOT TO SCALE



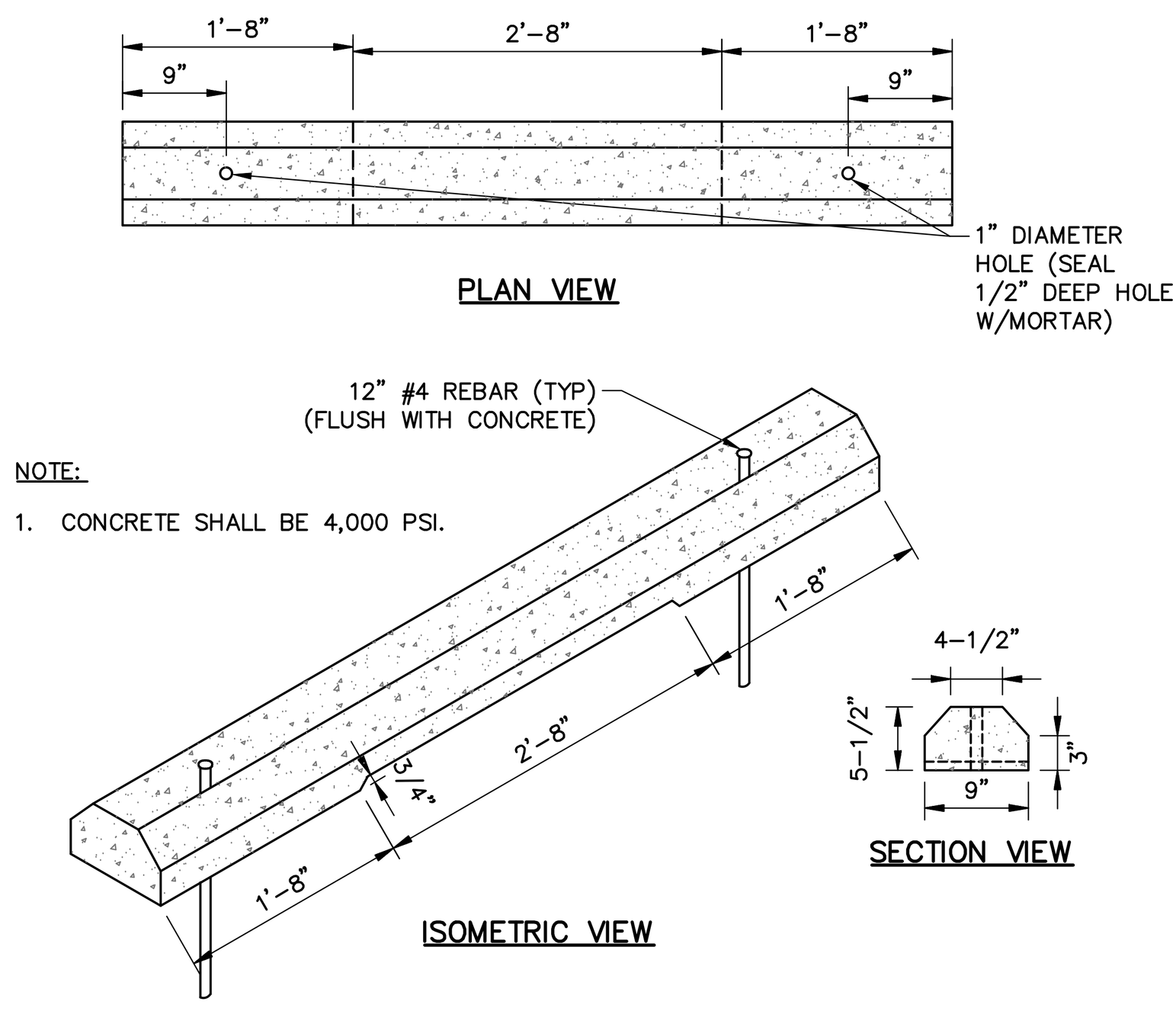
ACCESSIBLE PARKING STALL LAYOUT
N.T.S.



NOTES:

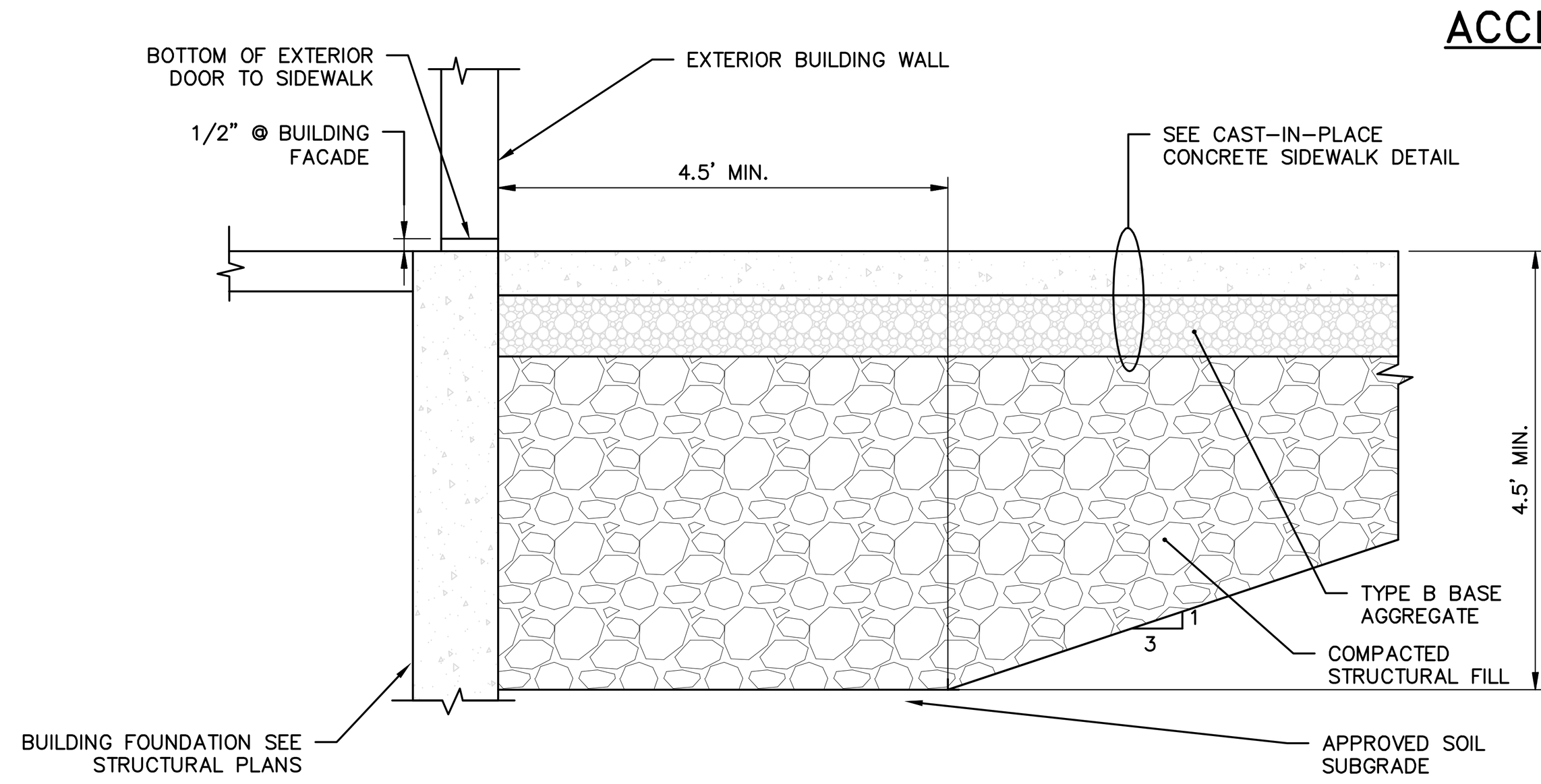
1. SYMBOL SHALL BE PAINTED WHITE IN COMPLIANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) SECTION 3B.19, SECTION 3B.20 AND FIGURE 3B-22.
2. A BLUE RECTANGULAR (MIN. 36" X 36") BACKGROUND AND WHITE BORDER ARE OPTIONAL IN ACCORDANCE WITH MUTCD SECTION 3B.19 AND FIGURE 3B-22.
3. SYMBOL FINISH SHALL BE NON-GLARE IN ACCORDANCE WITH ADA STANDARDS FOR ACCESSIBLE DESIGN SECTION 703.7.1.

INTERNATIONAL SYMBOL OF ACCESSIBILITY
N.T.S.



NOTE:
1. CONCRETE SHALL BE 4,000 PSI.

WHEEL STOP DETAIL
N.T.S.



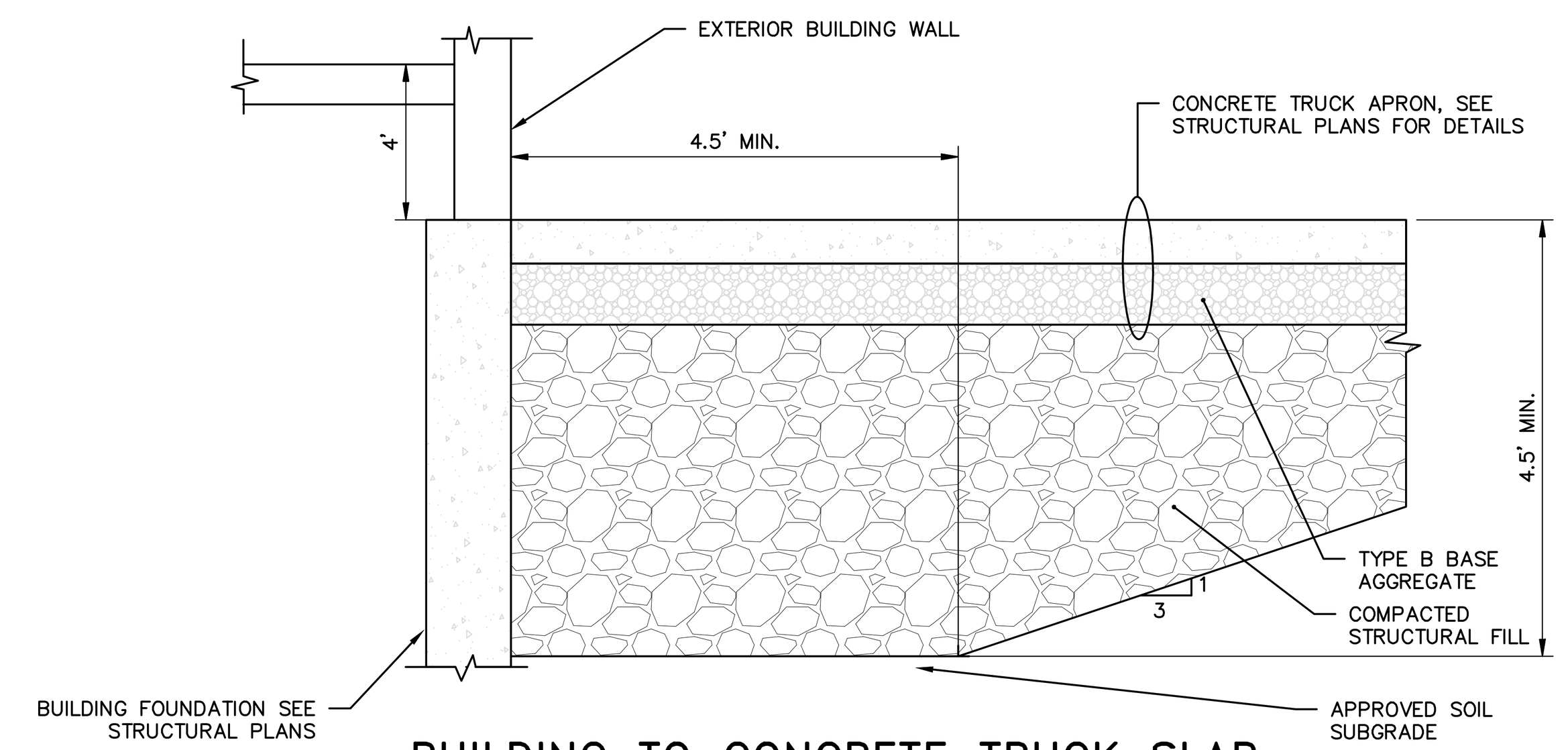
BUILDING TO CONCRETE SIDEWALK TRANSITION DETAIL
N.T.S.

CONCRETE SPECIFICATION:
- MDOT CLASS A CONCRETE

CONCRETE JOINT SPECIFICATION:
- SPACING OF JOINTS – 10 FEET ON CENTER ALONG LENGTH OR AS INDICATED ON STRUCTURAL AND ARCHITECTURAL PLANS.
- SAW CUT JOINTS AT 1 1/2" MAX. DEPTH

FINISH SPECIFICATION:
- BROOM SWEPT FINISH
- CURE WITH CURE-TO-SPEC MS
- AFTER CONSTRUCTION JOINTS HAVE BEEN FILLED AND SEALED; APPLY "CONSOLID DECK SALTGUARD"

NOTE:
- ALL CONCRETE SHALL BE PLACED BY AN A.C.I. FLATWORK CERTIFIED FINISHER



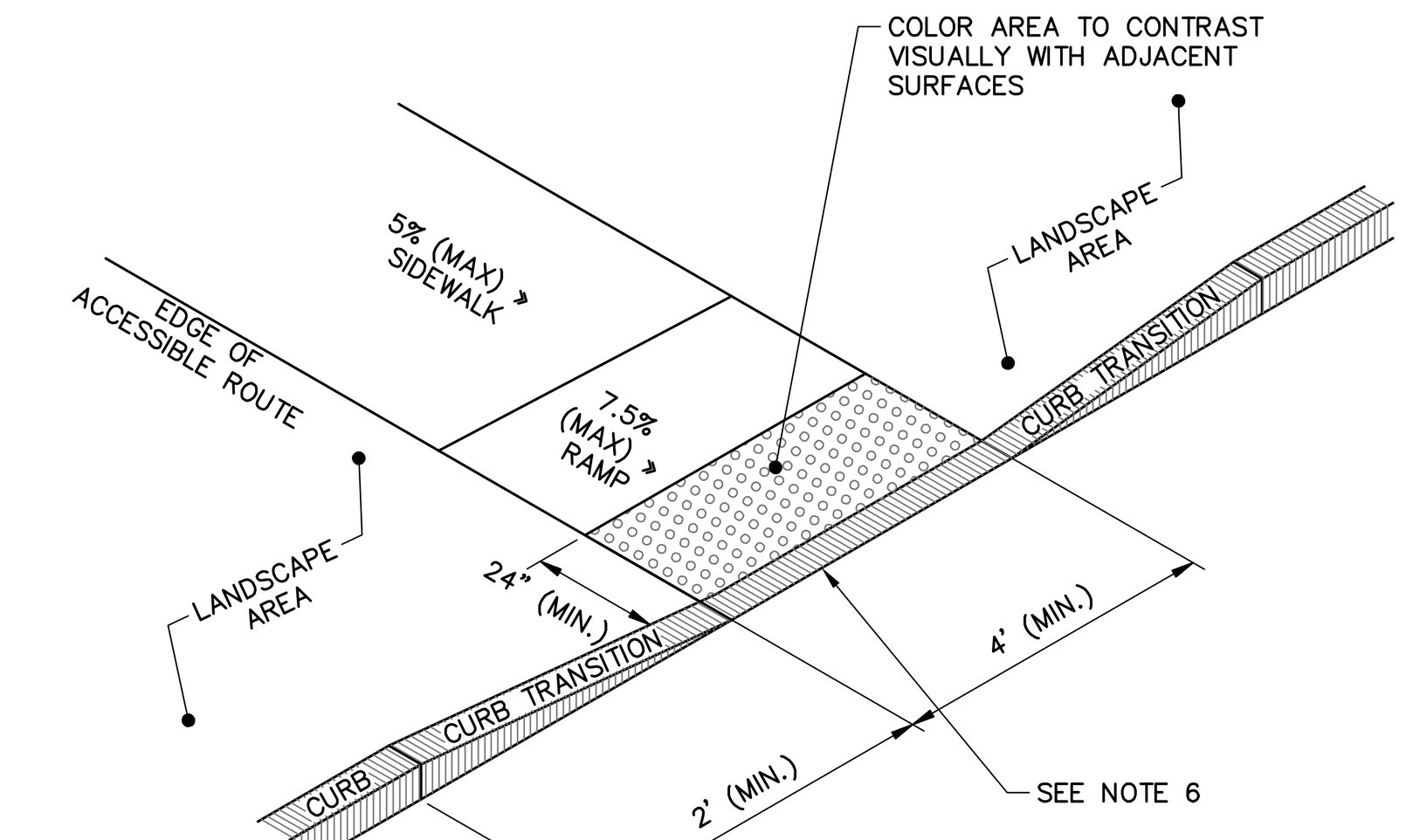
BUILDING TO CONCRETE TRUCK SLAB TRANSITION DETAIL
N.T.S.

CONCRETE SPECIFICATION:
- MDOT CLASS A CONCRETE

CONCRETE JOINT SPECIFICATION:
- SPACING OF JOINTS – 10 FEET ON CENTER ALONG LENGTH OR AS INDICATED ON STRUCTURAL AND ARCHITECTURAL PLANS.
- SAW CUT JOINTS AT 1 1/2" MAX. DEPTH

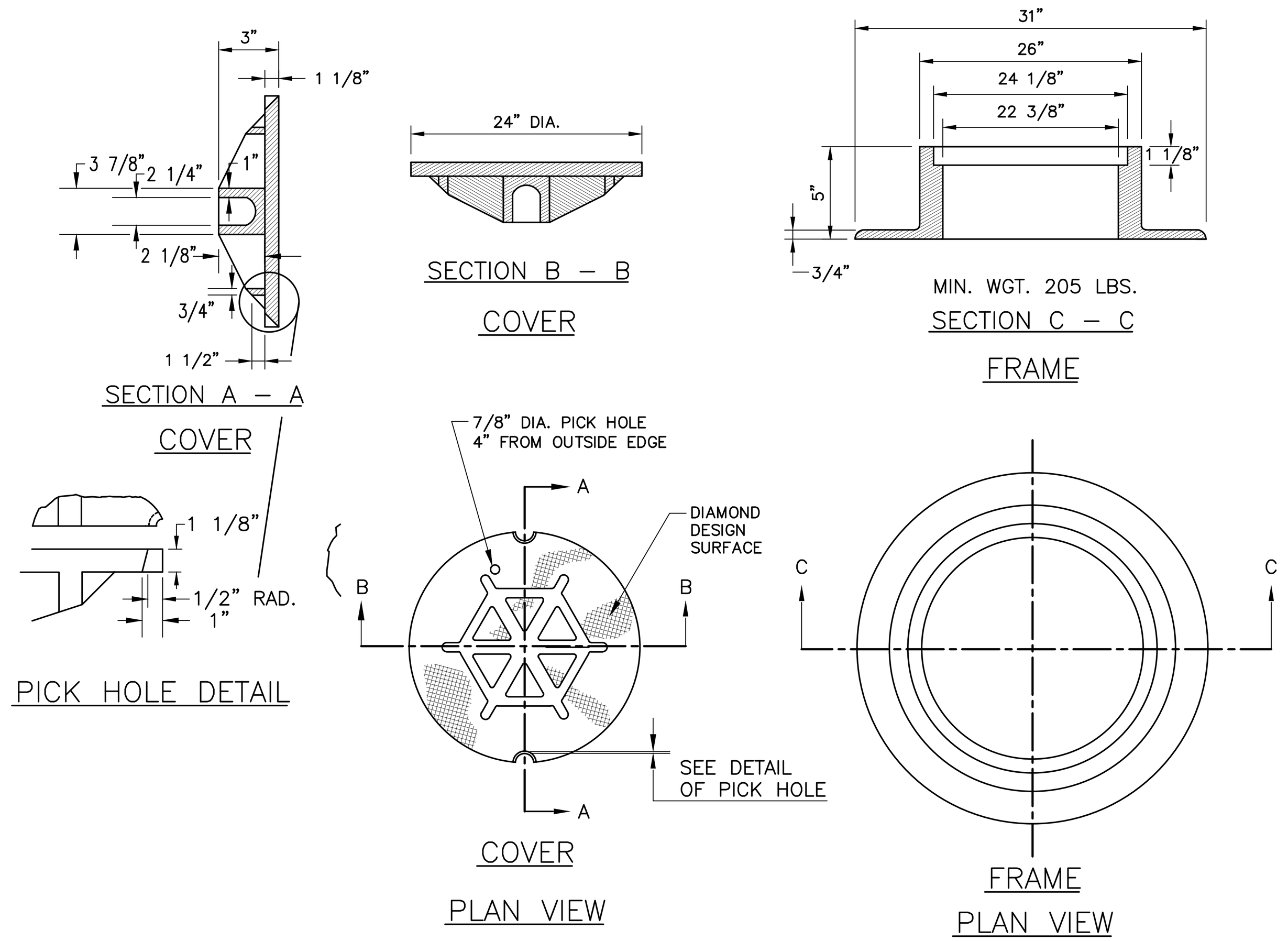
FINISH SPECIFICATION:
- BROOM SWEPT FINISH
- CURE WITH CURE-TO-SPEC MS
- AFTER CONSTRUCTION JOINTS HAVE BEEN FILLED AND SEALED; APPLY "CONSOLID DECK SALTGUARD"

NOTE:
- ALL CONCRETE SHALL BE PLACED BY AN A.C.I. FLATWORK CERTIFIED FINISHER



NOTE:
1. ACCESSIBLE CURB RAMP NOTES PROVIDED UNDER "ACCESSIBLE CURB RAMP – TYPE 'A' DETAIL ON THIS SHEET ARE APPLICABLE.

ACCESSIBLE CURB RAMP (ACR) – TYPE 'D'
NOT TO SCALE

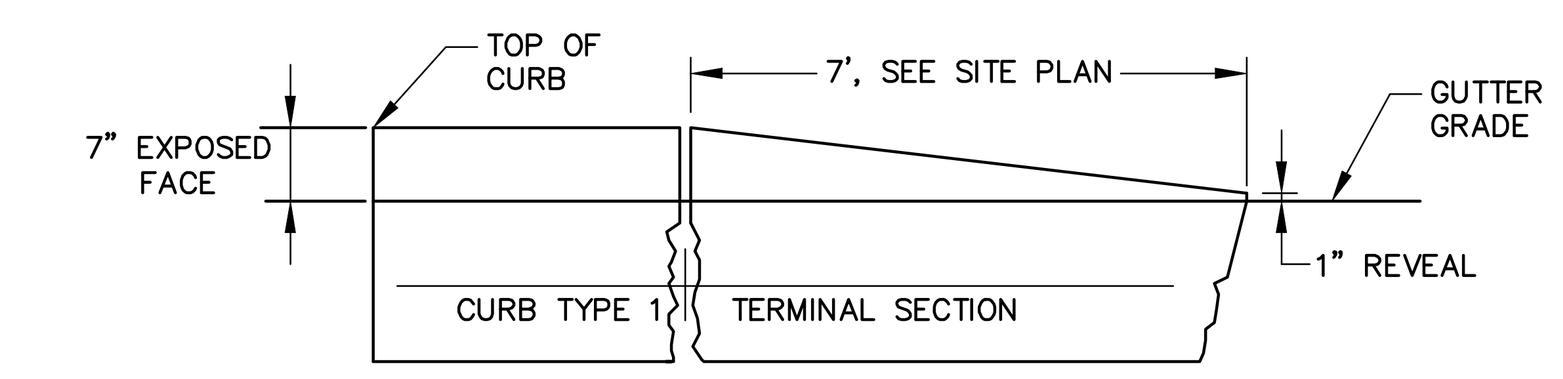


NOTE:
FOR ALL CROSS COUNTRY MANHOLES (LAWN AREAS), USE PAM REXUS MANHOLE COVERS BY CERTAINTEED.

TYPE "A" CAST IRON MANHOLE COVER AND FRAME
N.T.S.

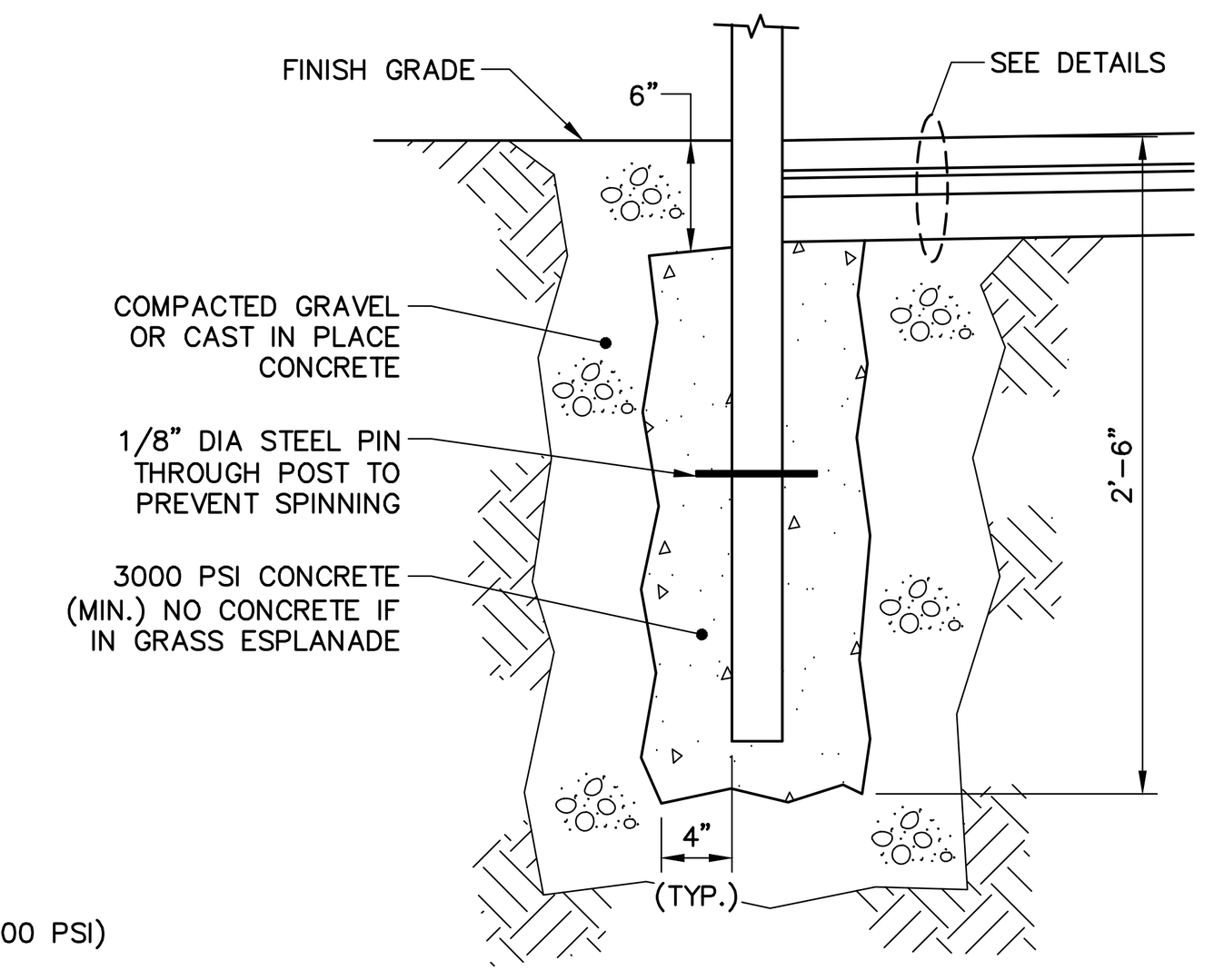
GENERAL NOTES FOR MANHOLES AND CATCH BASINS

1. ALL CONCRETE SHALL BE CLASS "A" AND HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 LBS. PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPEC. C-478.
3. ALL MANHOLES SHALL HAVE A BITUMINOUS WATERPROOFING APPLIED TO THE EXTERIOR SURFACE. IF CONSTRUCTED OF BRICK MASONRY, SURFACE SHALL BE PLASTERED WITH A SMOOTH MORTAR FINISH 3/8" THICK. AFTER THE MORTAR HAS SET, THE SURFACE SHALL BE WATERPROOFED AS REQUIRED BY SUPPLEMENTAL SPECIFICATIONS SECTION 604.
4. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35. ALL PARTS OF CASTINGS, EXCEPT FINISHED SURFACE, SHALL RECEIVE A COAT OF COAL TAR PITCH VARNISH OR ASPHALTUM PAINT WHICH SHALL BE SMOOTH AND TOUGH BUT NOT BRITTLE.
5. MANHOLES MAY BE CONSTRUCTED OF MASONRY, PRECAST REINFORCED CONCRETE, OR CAST IN PLACE.
6. CONTRACTOR SHALL SUBMIT ANTIFLOATATION CALCULATIONS FOR ALL MANHOLE AND CATCH BASIN STRUCTURES.
7. ALL PRECAST MANHOLES AND CATCH BASINS SHALL BE IDENTIFIED BY STATION, OFFSET, AND STRUCTURE ID PAINTED ON THE SIDE OF THE STRUCTURE BY THE MANUFACTURER.
8. STORM AND SEWER MANHOLES SHALL HAVE SOLID COVERS WITH ONE DRILLED PICK HOLE.
9. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND SHALL REMAIN THE PROPERTY OF OWNER.
10. WHEN THE FLOW CHANGES DIRECTION IN A MANHOLE, THE CHANNEL ALIGNMENT SHALL FOLLOW A SMOOTH RADIUS. CHANNELS SHALL BE FORMED TO ACCEPT ALL INLET PIPES.
11. ON STORM AND SEWER MANHOLES, THE SHELF AND CHANNEL SHALL BE FORMED BY BRICK SET IN CEMENT MORTAR OR BY FACTORY PRE-CAST CONCRETE. SUCH PRE-CAST CONCRETE SHALL BE EPOXY COATED AND THE SHELF SHALL HAVE A PERMANENT NON-SKID SURFACE.



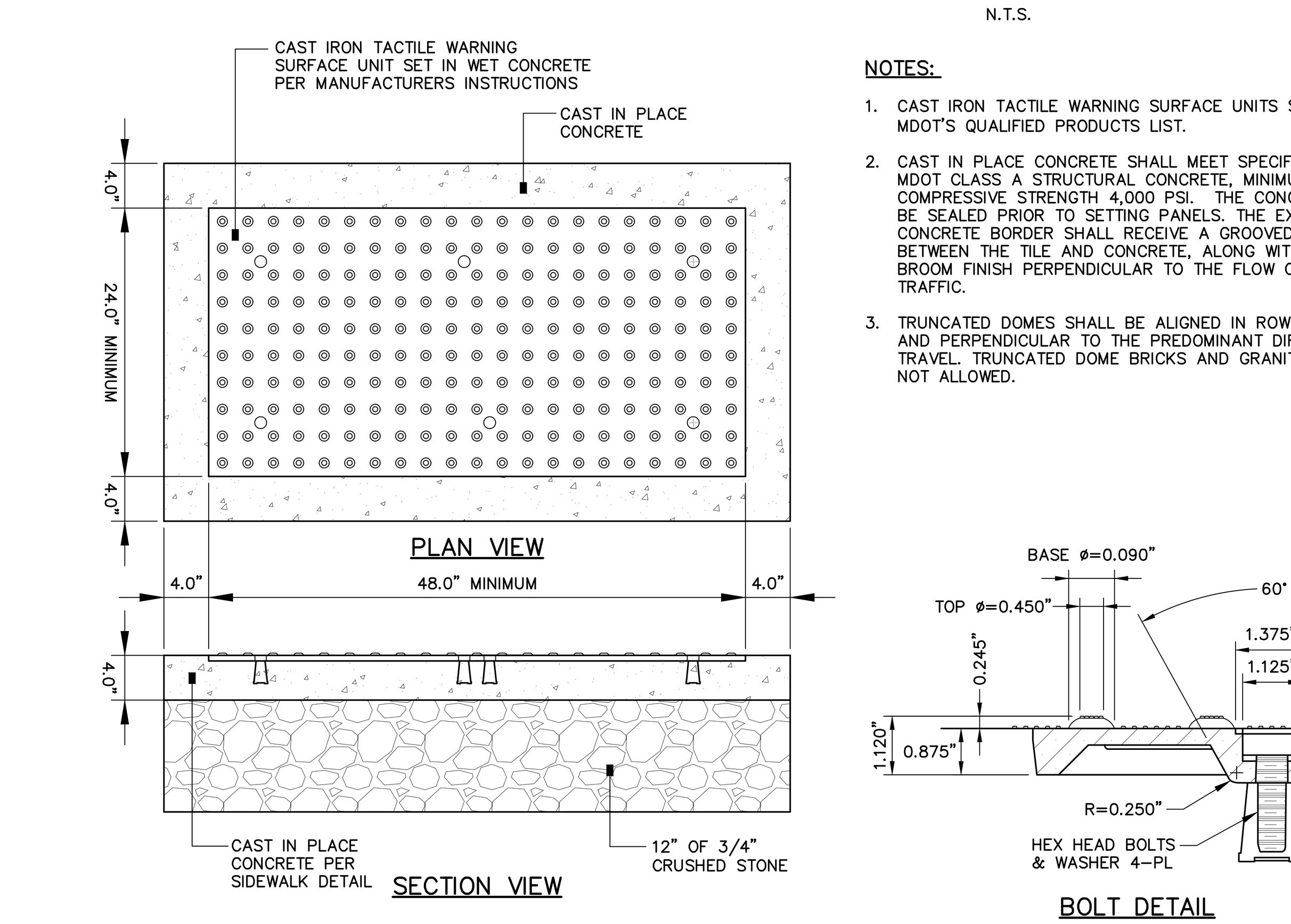
TERMINAL SECTION TYPE "1"

TERMINAL CURB SECTION
N.T.S.



POST SPECIFICATION		
TYPE	HEIGHT ABOVE FIN. GRADE	POST MATERIAL
STREET SIGNAGE	7'-0"	GALV. STEEL

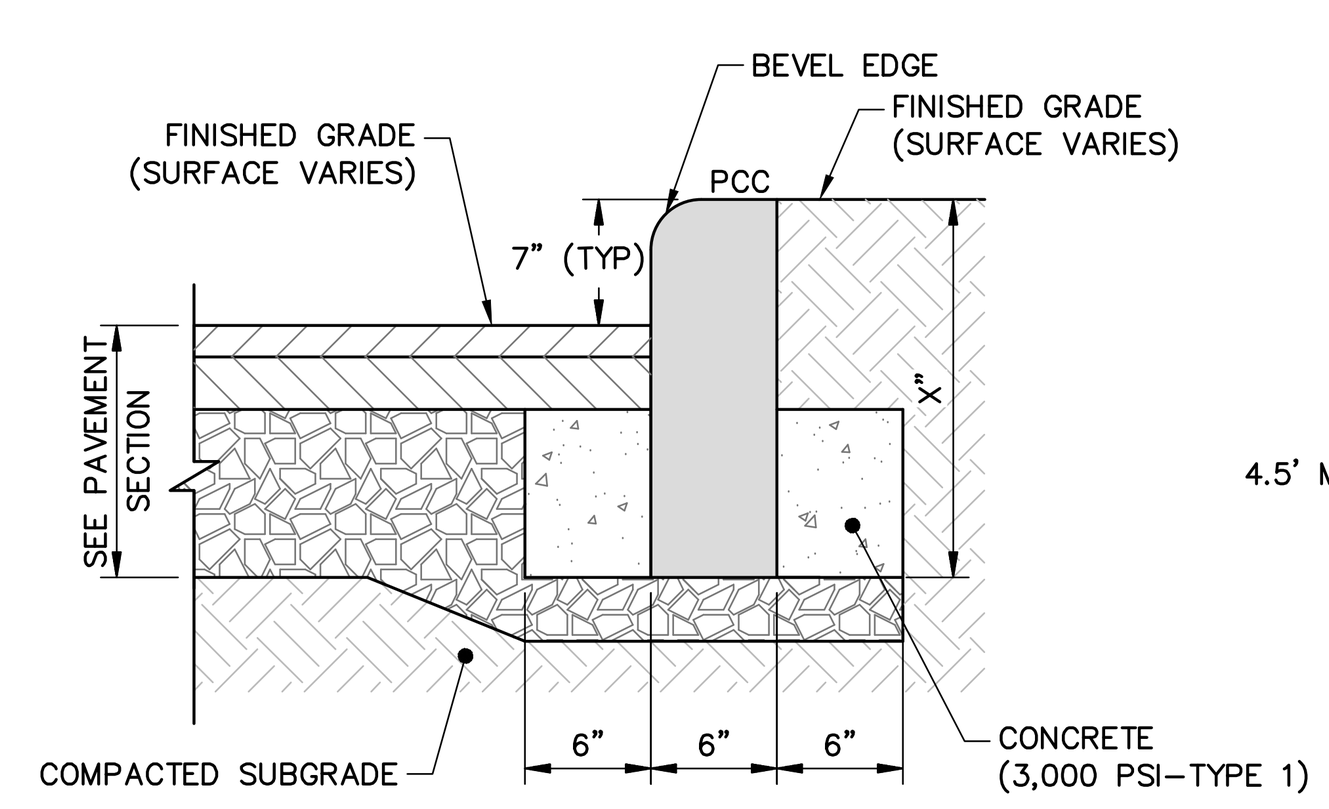
TYPICAL SIGN POST DETAIL
N.T.S.



NOTES:

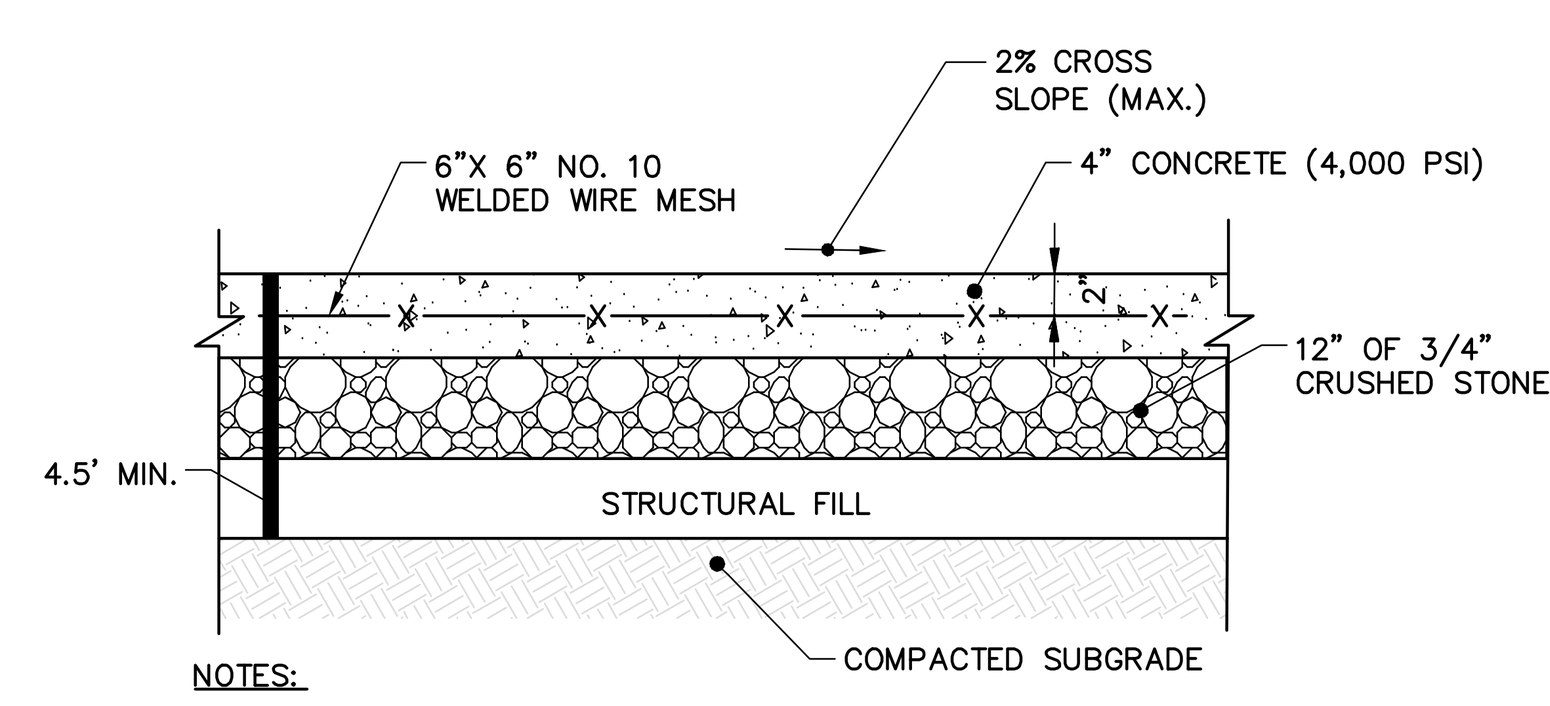
1. CAST IRON TACTILE WARNING SURFACE UNITS SHALL BE PER MDOT'S QUALIFIED PRODUCTS LIST.
2. CAST IN PLACE CONCRETE SHALL MEET SPECIFICATIONS FOR MDOT CLASS A STRUCTURAL CONCRETE, MINIMUM COMPRESSIVE STRENGTH 4,000 PSI. THE CONCRETE SHALL BE SEALED PRIOR TO SETTING PANELS. THE EXPOSED CONCRETE BORDER SHALL RECEIVE A GROOVED EDGE BETWEEN THE TILE AND CONCRETE, ALONG WITH A UNIFORM BROOM FINISH PERPENDICULAR TO THE FLOW OF PEDESTRIAN TRAFFIC.
3. TRUNCATED DOMES SHALL BE ALIGNED IN ROWS, PARALLEL AND PERPENDICULAR TO THE PREDOMINANT DIRECTION OF TRAVEL. TRUNCATED DOME BRICKS AND GRANITE PAVERS ARE NOT ALLOWED.

SIDEWALK RAMP DETECTABLE WARNING
N.T.S.



NOTE:
1. FOR CURB INSTALLATION AT EXISTING PAVEMENT INSTALL BITUMINOUS CONCRETE PATCH PER SPECIFICATIONS.

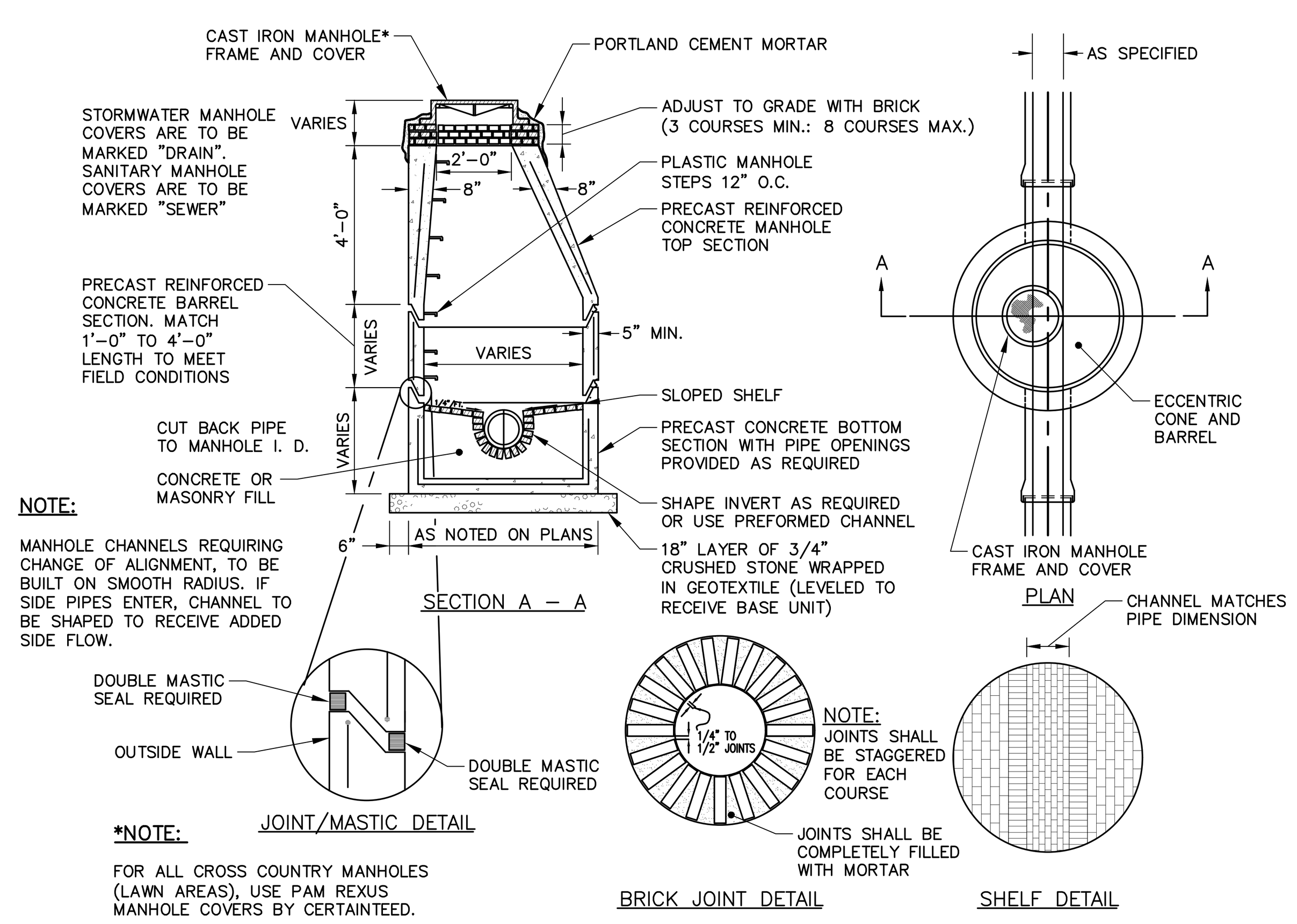
PRECAST CONCRETE CURB (PCC)
N.T.S.



NOTES:

1. PROVIDE 1/2" PREMOLDED BITUMINOUS EXPANSION JOINTS AT 20 FT. INTERVALS.
2. PROVIDE CONTROL JOINTS AT 5 FT. INTERVALS OR AS SHOWN ON LANDSCAPE PLANS.
3. PROVIDE LIGHT BROOM FINISH AFTER TOOLING OF EDGES/JOINTS. NO TOOLING PATTERNS ON FINISH SLAB

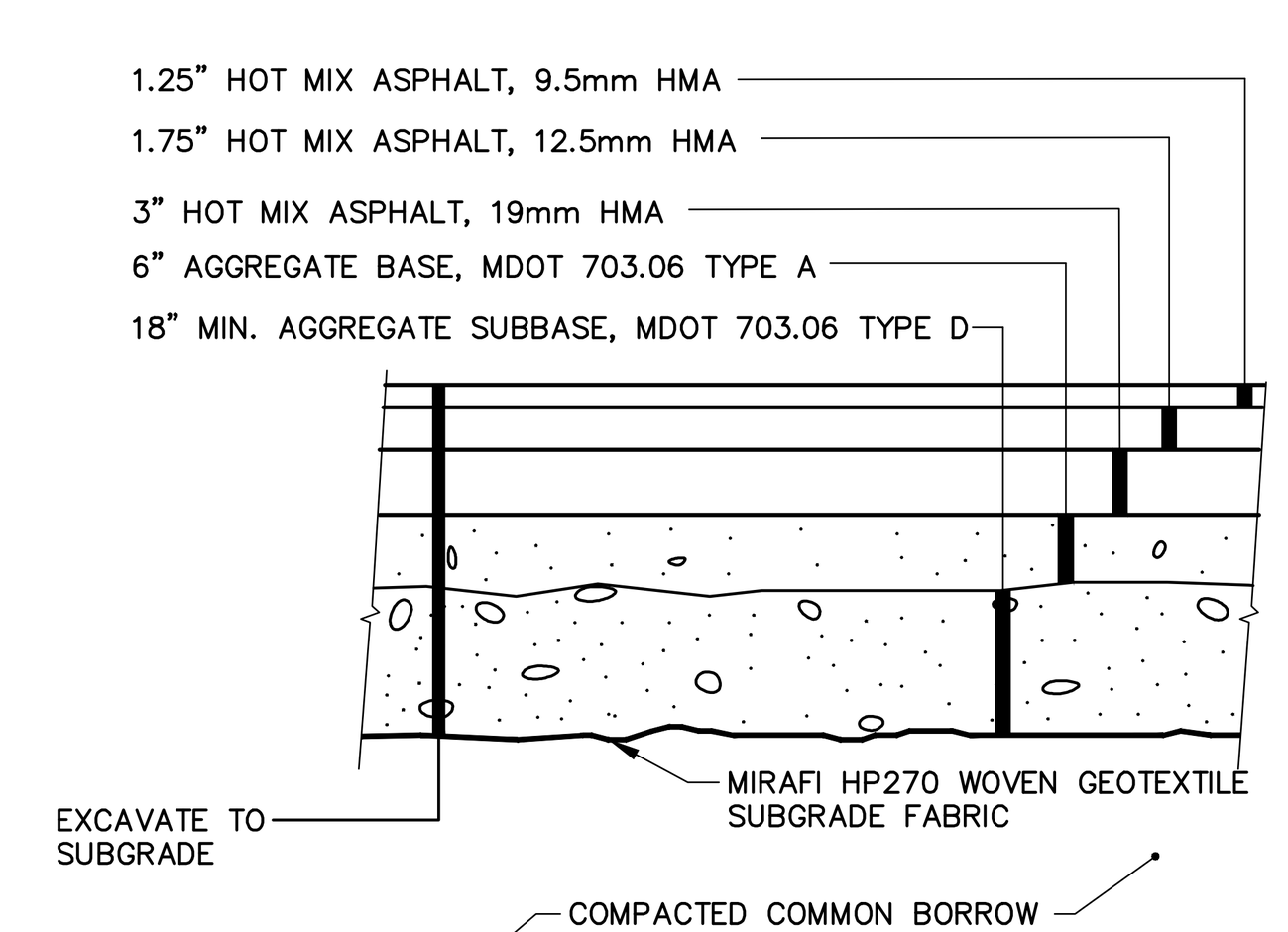
CAST-IN-PLACE CONCRETE SIDEWALK
N.T.S.



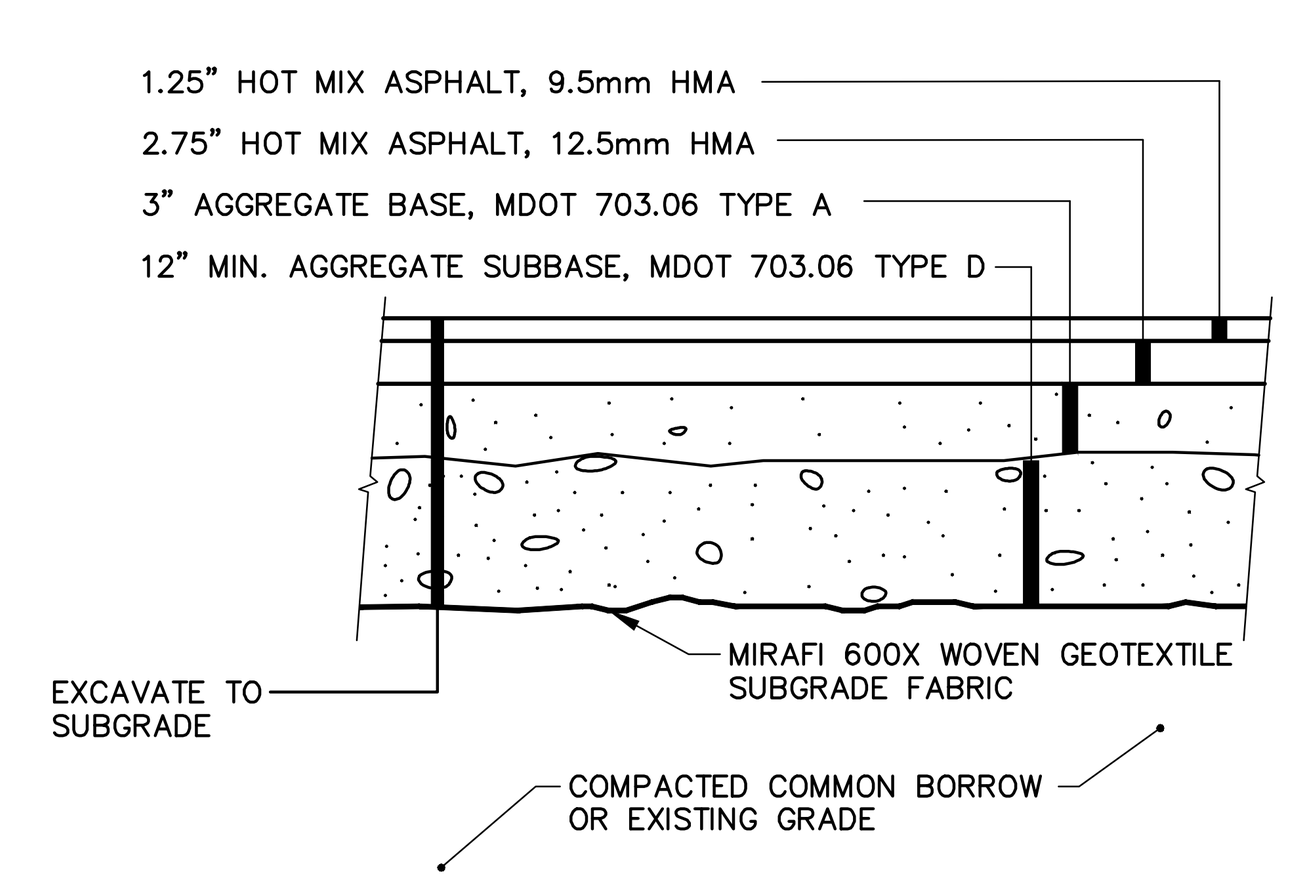
NOTE:
MANHOLE CHANNELS REQUIRING CHANGE OF ALIGNMENT, TO BE BUILT ON SMOOTH RADIUS. IF SIDE PIPES ENTER, CHANNEL TO BE SHAPED TO RECEIVE ADDED SIDE FLOW.

*NOTE:
FOR ALL CROSS COUNTRY MANHOLES (LAWN AREAS), USE PAM REXUS MANHOLE COVERS BY CERTAINTEED.

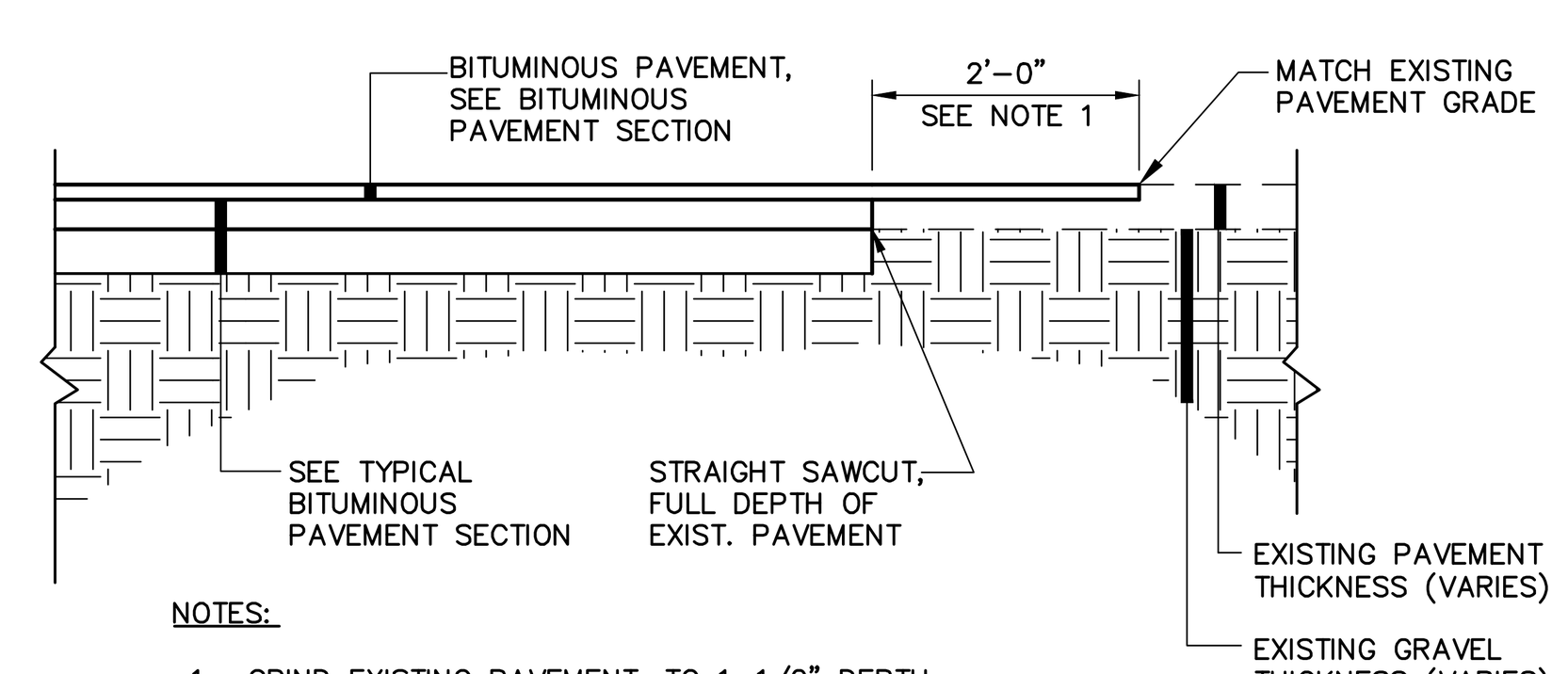
PRECAST CONCRETE MANHOLE
N.T.S.



TYPICAL HEAVY DUTY BITUMINOUS PAVEMENT SECTION
N.T.S.



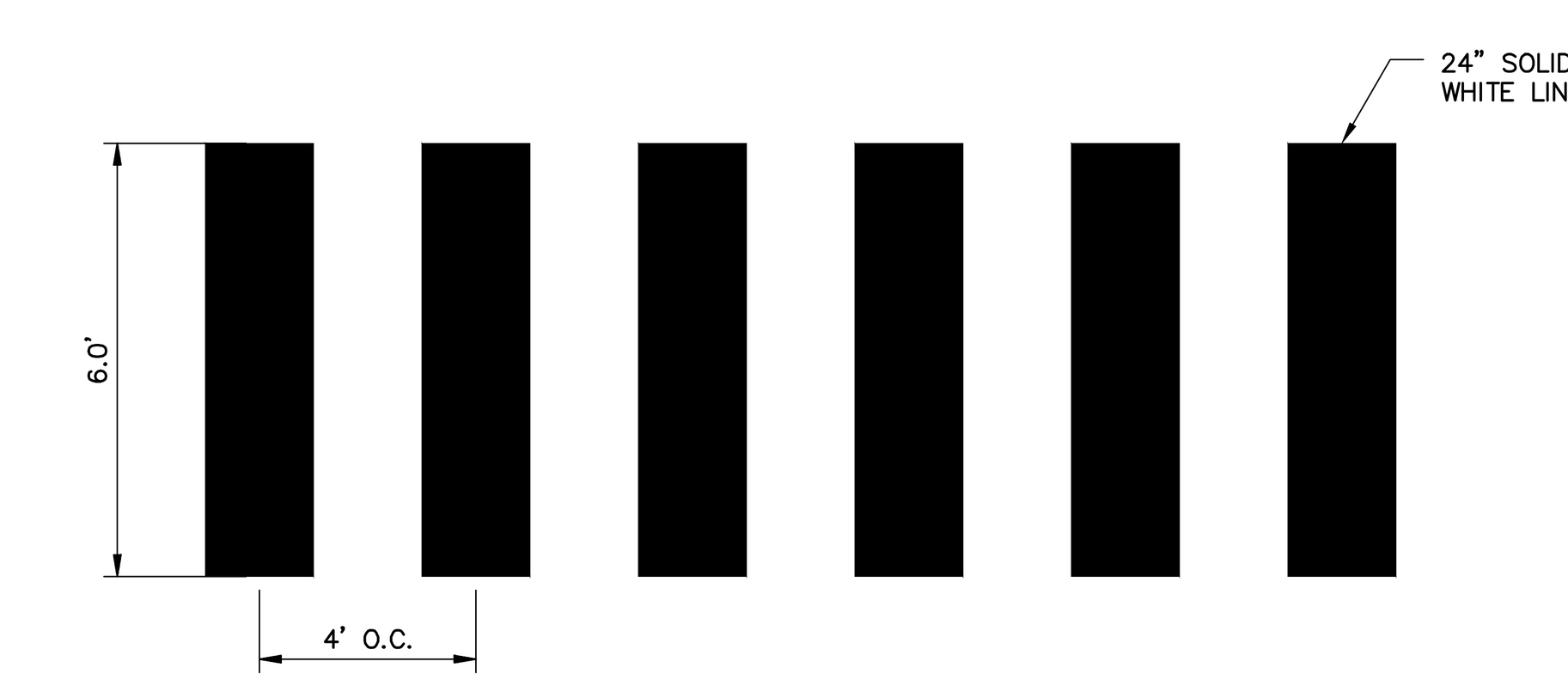
TYPICAL STANDARD DUTY BITUMINOUS PAVEMENT SECTION
N.T.S.



NOTES:

1. GRIND EXISTING PAVEMENT, TO 1-1/2" DEPTH.
2. PROVIDE BITUMINOUS TACK COAT ON VERTICAL AND HORIZONTAL SURFACES PRIOR TO PAVING.
3. DETAIL APPLICABLE TO PAVEMENT BUTT JOINTS AT ROADWAY WORK LIMITS. REFER TO PIPE INSTALLATION DTL. OR PAVED ROAD SECTION DTLS. FOR TRENCH REPAIR REQUIREMENTS.

PAVEMENT BUTT JOINT DETAIL
N.T.S.



CROSSWALK WITH LONGITUDINAL LINES
N.T.S.

ISSUED FOR BID - NOT FOR CONSTRUCTION

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
LICENSED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
C	ISSUED FOR BID	5-29-2020
B	RESPONSE TO CITY COMMENTS	5-15-2020
A	BID DRAWING PROGRESS SET	3-26-20

DESIGNED BY: ANL
DRAWN BY: BCM\PF
CHECKED BY: DS
0232277.00 C20X.dwg

CIVIL DETAILS - 3

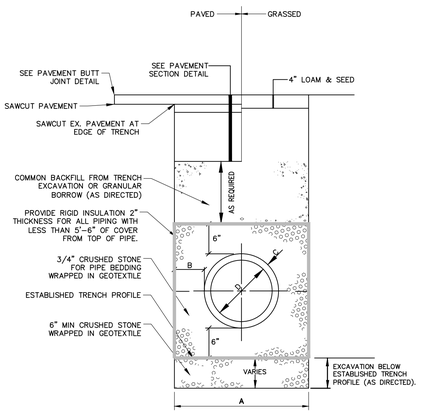
MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 9 OF --

C-202

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Drawings\Civil\0232277.00 C20X.dwg, Jul 31, 2020 - 9:37am



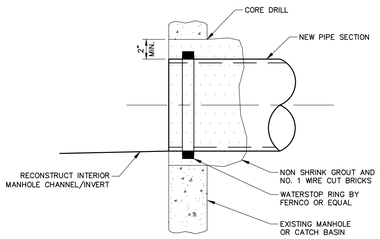
PIPE INSTALLATION DETAIL

N.T.S.

PIPE INSTALLATION DETAIL – NOTES

1. ALTERNATIVE CONSTRUCTION METHODS OR PAYMENT METHODS SHALL BE APPROVED IN ADVANCE.
2. IN PAVED AREAS, DEPTHS OF GRAVEL AND HOT MIX ASPHALT PAVEMENT SHALL MATCH THE GREATER OF EXISTING CONDITIONS OR THE REQUIREMENTS FOR THE CORRESPONDING STREET CLASSIFICATION.
3. DIMENSION "B" SHALL BE SUFFICIENT TO ALLOW CRUSHED STONE BEDDING TO BE PLACED AND COMPACTED UNDER THE HAUNCHES OF THE PIPE; BUT IN ALL CASES "B" SHALL BE AT LEAST 9".
4. DIMENSION "A" SHALL BE BASED ON PIPE DIAMETER, AS SET FORTH IN THE FOLLOWING TABLE.

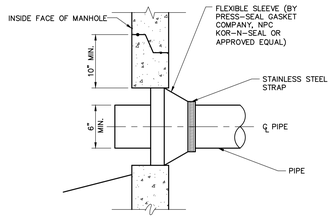
PIPE DIAMETER, "D" (INCHES)	MAX. TRENCH WIDTH, "A" (FEET)
6	4.0
8	4.0
10	4.0
12	4.0
15	4.0
18	5.0
21	5.0
24	5.5
27	6.0
30	6.0
36	7.0
42	8.0
48	8.0



NEW PIPE TO EXISTING STRUCTURE

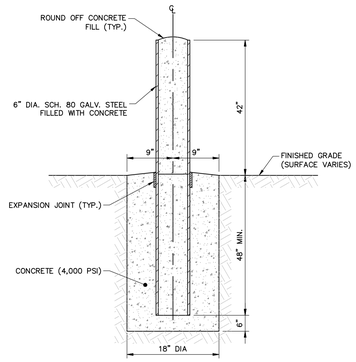
N.T.S.

NOTE: EXISTING MANHOLE OR CATCH BASIN SHALL BE CORE DRILLED FOR PIPE INSTALLATION



NEW PIPE TO NEW STRUCTURE CONNECTION DETAIL

N.T.S.

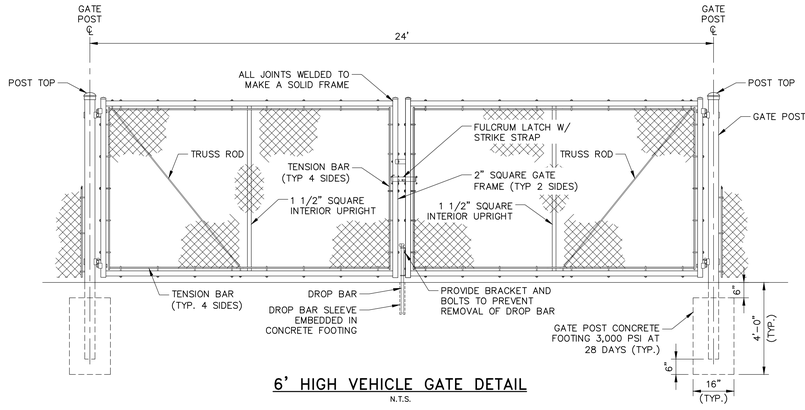


NOTE:

1. ALL BOLLARDS SHALL BE PAINTED. COLOR SELECTED BY OWNER.

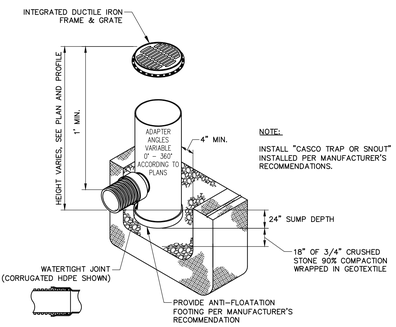
6" DIA. BOLLARD

N.T.S.



6' HIGH VEHICLE GATE DETAIL

N.T.S.

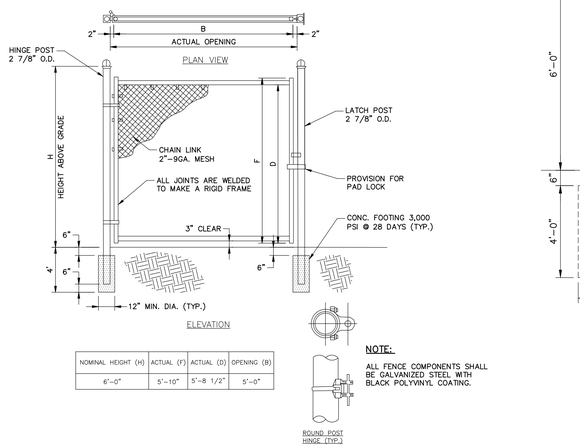


NOTE:

INSTALL "CASCO TRAP OR SNOUT" INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

24" DIAMETER BASIN

N.T.S.



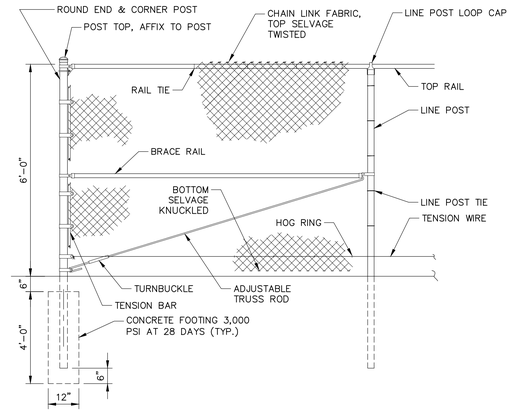
NOMINAL HEIGHT (H)	ACTUAL (F)	ACTUAL (D)	OPENING (B)
6'-0"	5'-10"	5'-8 1/2"	5'-0"

NOTE:

ALL FENCE COMPONENTS SHALL BE GALVANIZED STEEL WITH BLACK POLYVINYL COATING.

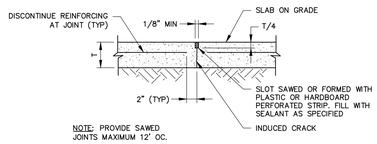
CHAIN LINK PERSONNEL GATE

N.T.S.



6' HIGH CHAIN LINK FENCE DETAIL

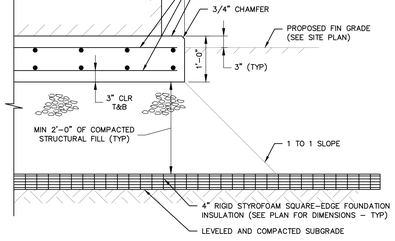
N.T.S.



NOTE: PROVIDE SAWED JOINTS MAXIMUM 12' OC.

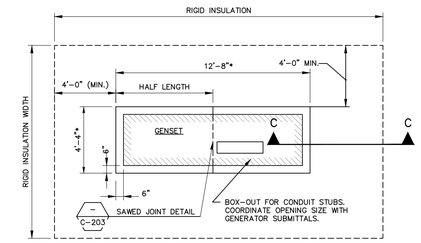
SAWED JOINT DETAIL

N.T.S.



SECTION C–C

SCALE: 3/4" = 1'-0"



PLAN

SCALE: 1/4" = 1'-0"

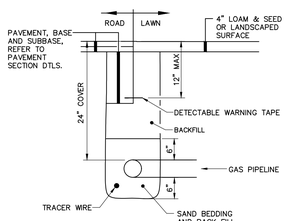
GENSET PAD DETAIL

SCALE: AS NOTED

NOTES:

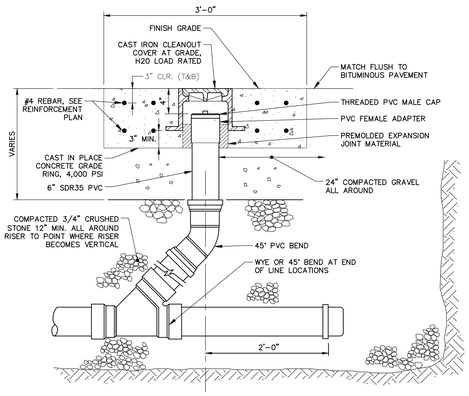
1. CONTRACTOR SHALL FIELD VERIFY GENSET SIZE WITH SHOP DRAWINGS.
2. REFER TO CIVIL DRAWINGS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
3. GENERATOR MUST BE SPACED A MINIMUM OF 5'–0" FROM STRUCTURES PER NFPA 37.

* COORDINATE ALL DIMENSIONS INDICATED WITH APPROVED SUBMITTAL.



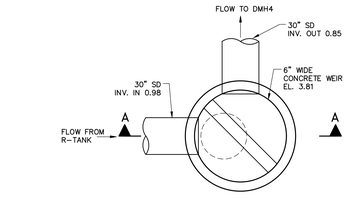
GAS PIPE TRENCH DETAIL

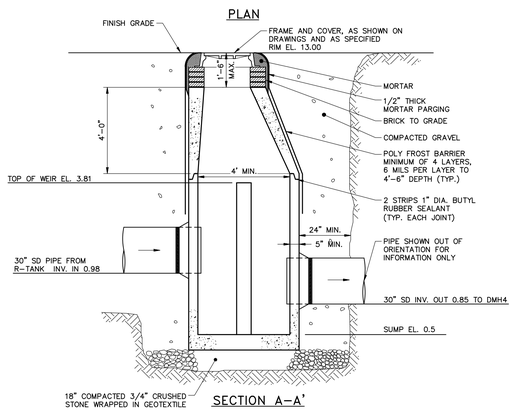
N.T.S.



CLEANOUT DETAIL

N.T.S.





OUTLET CONTROL STRUCTURE (OCS) DETAIL

N.T.S.

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STATE OF MAINE — DARRIN B. STAIRS — No. 15118 — LICENSED PROFESSIONAL ENGINEER

#	DESCRIPTION	DATE

#	DESCRIPTION	DATE
1	ISSUED FOR BID	5-29-2020
2	ADDRESS BID COMMENTS	6-26-2020
A	BID DRAWING SET	7-30-2020

DESIGNED BY: ANL | DRAWN BY: BDM/SF | CHECKED BY: DS | 0332770.1705.rpt

CIVIL DETAILS - 4

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

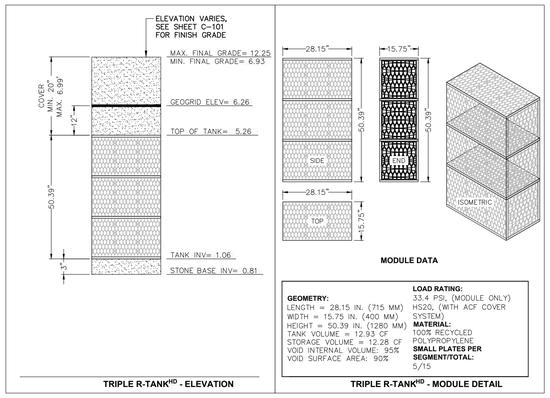
JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 10 OF --

C-203

C:\Users\bcummings\Desktop\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\Civil\Drawings\Civil\0232277.00 C203.dwg, Jul 31, 2020 - 9:31am

R-TANK^{HD} QUANTITIES	
R-TANK^{HD} MODULE TYPE	TRIPLE
# OF TRIPLE R-TANKS	2,025
TOTAL SYSTEM STORAGE	28,733 CF
R-TANK STORAGE VOLUME	24,867 CF
STONE STORAGE VOLUME (40% VOID RATIO)	3,866 CF
STONE BED FOOTPRINT	6,895 SF
STONE QUANTITY	422 CY
8 OZ. NON-WOVEN GEOTEXTILE TANK WRAP	15,891 SF (1,766 SY)
30 MIL PVC LINER EXCAVATION WRAP	17,873 SF (1,986 SY)
8 OZ. NON-WOVEN GEOTEXTILE LINER PROTECTION	35,746 SF (3,972 SY)
ACF BX-12 GEOGRID	9,132 SF (1,015 SY)
12" MAINTENANCE PORTS	4
12" PIPE BOOTS	1
24" PIPE BOOTS	3
30" PIPE BOOTS	1
NOTE: STONE QUANTITY INCLUDES 12" OF COVER AND 3" OF BASE.	
NOTE: GEOTEXTILE/LINER QUANTITIES INCLUDE A 15% WASTE FACTOR.	

NOTE: BASE STONE STORAGE NOT INCLUDED IN VOLUMES.



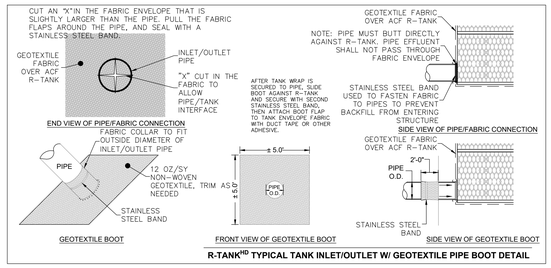
MODULE DATA

GEOMETRY:
LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 50.39 IN. (1280 MM)
TANK VOLUME = 12.93 CF
STORAGE VOLUME = 12.28 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING:
33.4 PSI, (MODULE ONLY)
HS20, (WITH ACF COVER SYSTEM)
MATERIAL:
100% RECYCLED POLYPROPYLENE
SMALL PLATES PER SEGMENT/TOTAL:
5/15

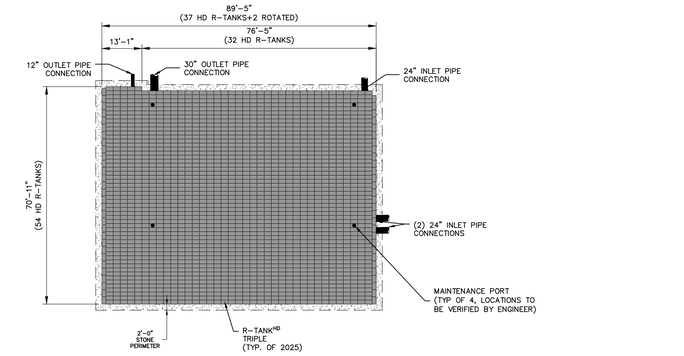
TRIPLE R-TANK^{HD} - ELEVATION | **TRIPLE R-TANK^{HD} - MODULE DETAIL**

TRIPLE R-TANK-ELEVATION & MODULE DETAIL
N.T.S.



R-TANK^{HD} TYPICAL TANK INLET/OUTLET W/ GEOTEXTILE PIPE BOOT DETAIL

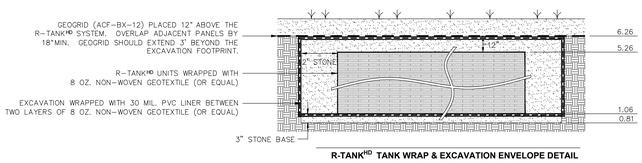
R-TANK TYPICAL TANK INLET/OUTLET WITH GEOTEXTILE PIPE BOOT DETAIL
N.T.S.



NOTE: BASE STONE STORAGE NOT INCLUDED IN VOLUMES.

0 20' 40'
SCALE 1" = 20'

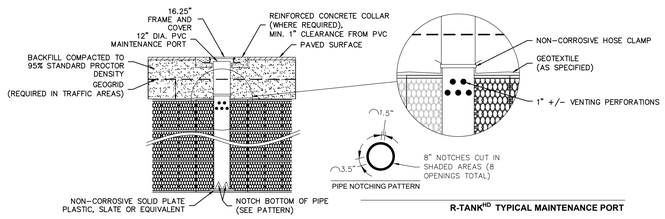
LAYOUT SCALE	1"=20'
R-TANK^{HD} MODULE TYPE	TRIPLE
TRAFFIC LOAD	HS-20
# OF TRIPLE R-TANKS	2,025
TOTAL SYSTEM STORAGE	28,733 CF
R-TANK STORAGE VOLUME	24,867 CF
STONE STORAGE VOLUME (40% VOID RATIO)	3,866 CF
TOP OF COVER STONE ELEV. 12")	6.26
ACF BX-12 GEOGRID ELEV.	6.26
TOP OF R-TANK ELEV.	5.26
TANK INVERT	1.06
INVERT OF STONE BASE (3")	0.81
MIN. STONE PERIMETER WIDTH	2.0 FT



R-TANK^{HD} TANK WRAP & EXCAVATION ENVELOPE DETAIL

R-TANK TANK WRAP & EXCAVATION ENVELOPE DETAIL
N.T.S.

NOTES
1. THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.
2. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
3. ONLY R-TANK^{HD} AND R-TANK^{SD} MAY BE USED IN TRAFFIC APPLICATIONS.
4. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.

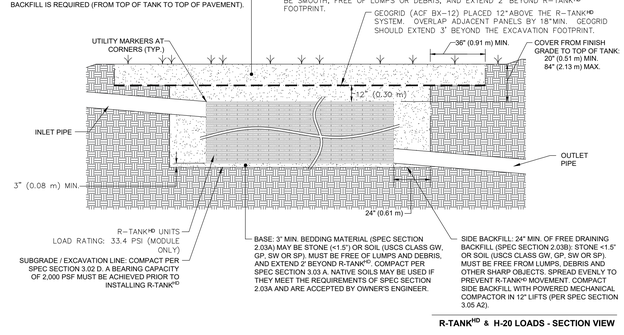


R-TANK^{HD} TYPICAL MAINTENANCE PORT

R-TANK TYPICAL MAINTENANCE PORT
N.T.S.

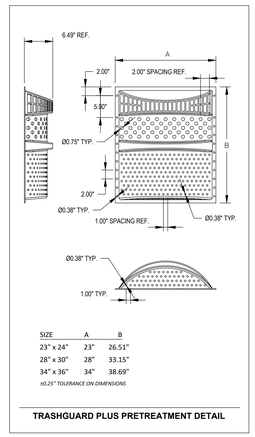
TOTAL COVER: 20" MINIMUM AND 84" MAXIMUM. FIRST 12" MUST BE FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). ADDITIONAL FILL MAY BE STRUCTURAL FILL (SPEC SECTION 2.03C): STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4 A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 7'. CONTACT ACF ENVIRONMENTAL IF MORE THAN 7' OR LESS THAN 20" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).

NOTES:
1. FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^{HD} MODULE SHEET .
2. INSTALLATIONS PER THIS DETAIL MEET GUIDELINES OF HL-93 LOADING PER THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, CUSTOMARY U.S. UNITS, 7TH EDITION, 2014 WITH 2015 AND 2016 INTERIM REVISIONS.
3. PRE-TREATMENT STRUCTURES NOT SHOWN.
4. FOR INFILTRATION APPLICATIONS, GEOTEXTILE ENVELOPING R-TANK SHALL BE ACF M200 (PER SPEC SECTION 2.02A) AND BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03A) TO PROVIDE A LEVEL BASE. SURFACE MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{HD} FOOTPRINT.



R-TANK^{HD} & H-20 LOADS - SECTION VIEW

R-TANK & H-20 LOADS - SECTION VIEW
N.T.S.



SIZE	A	B
23" x 24"	23"	26.51"
28" x 30"	28"	33.15"
34" x 36"	34"	38.69"

±0.25" TOLERANCE ON DIMENSIONS

TRASHGUARD PLUS PRETREATMENT DETAIL

TRASHGUARD PLUS PRETREATMENT DETAIL
N.T.S.

41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: ANL | DRAWN BY: BDM | CHECKED BY: DS

REV	DESCRIPTION	DATE
C	ISSUED FOR BID	5-29-2020
B	REVISED PER CITY COMMENTS	4-24-2020
A	90% DRAWING PROGRESS SET	2-28-2020

CIVIL DETAILS - 5

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

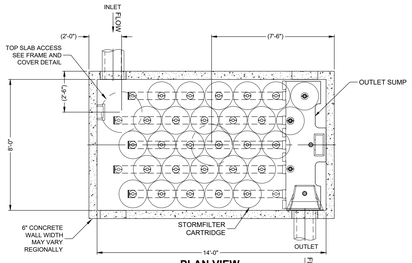
MAINE INTERNATIONAL
COLD STORAGE FACILITY

JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 11 OF --

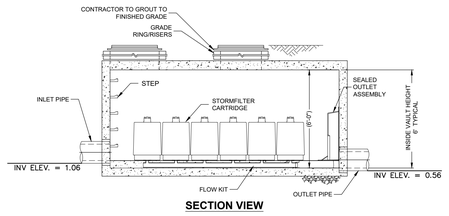
C-204

ISSUED FOR BID - NOT FOR CONSTRUCTION

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Portland\Web Drawings\Civil\0232277.00 C204.dwg, Jul 31, 2020 - 8:35am



PLAN VIEW
VAULT STYLE: OUTLET SUMP (NIB)



SECTION VIEW

Patent pending
StormFilter®

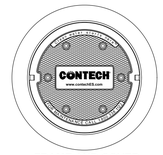
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (34). VAULT STYLE OPTIONS INCLUDE INLET BAY (27), INLET BAY/OUTLET BAY (22), OUTLET BAY (29), INLET BAY/FULL HEIGHT BAFFLE (28), FULL HEIGHT BAFFLE WALL (25).
STORMFILTER 8X14 PEAK HYDRAULIC CAPACITY IS 1.8 CFS. IF THE SITE CONDITIONS EXCEED 1.8 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"	
RECOMMENDED HYDRAULIC DROP (H)	3.05'	
SPECIFIC FLOW RATE (gpm/sf)	0.27* gpm/sf	
CARTRIDGE FLOW RATE (gpm)	3	

* 0.27 gpm/sf SPECIFIC FLOW RATE IS APPROVED PER ME DEP



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			SF
WATER QUALITY FLOW RATE (cfs)			0.18
PEAK FLOW RATE (cfs)			N/A
RETURN PERIOD OF PEAK FLOW (yrs)			N/A
CARTRIDGE HEIGHT (27", 18", LOW DROP(LD))			27"
NUMBER OF CARTRIDGES REQUIRED			28
CARTRIDGE FLOW RATE			3 GPM
MEDIA TYPE (PERLITE, ZPG, PSORB)			ZEO-PSORB
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	1.06	*	12
INLET PIPE #2	*	*	*
OUTLET PIPE	0.56	*	12
UPSTREAM RIM ELEVATION			12.50
DOWNSTREAM RIM ELEVATION			12.50
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT	
	N/A	N/A	
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONFORMING TO ASTM C-857 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOATATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

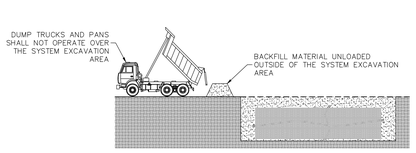
CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr. West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

COLD STORAGE FACILITY
STORMFILTER
STANDARD DETAIL

NOTES:
1. ANTI-FLOATATION MEASURES WILL LIKELY BE REQUIRED. THE STORMFILTER STRUCTURE SHALL BE DESIGNED PER MANUFACTURER RECOMMENDATION.
2. STORMWATER STRUCTURE SHALL BE PLACED ON AN 18" LAYER OF 3/4"-INCH CRUSHED STONE WRAPPED IN GEOTEXTILE PER GEOTECHINICAL RECOMMENDATIONS.

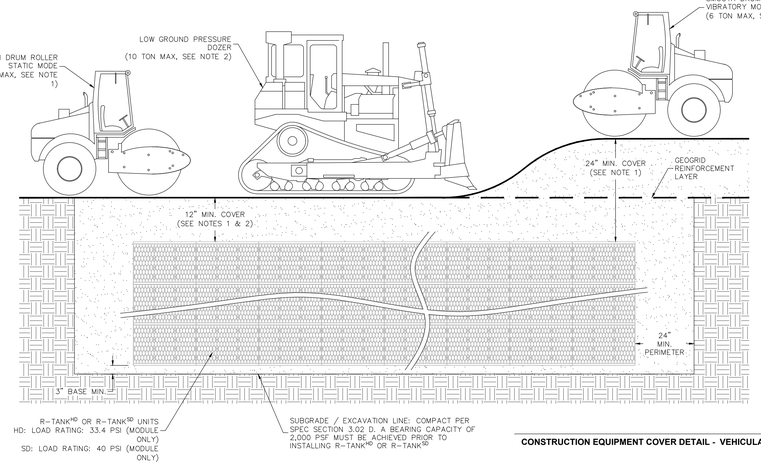
STORMFILTER STANDARD DETAIL

N.T.S.



DUMP TRUCK DETAIL (SEE NOTE 3)

NOTES:
1. FOLLOWING PLACEMENT OF SIDE BACKFILL, A UNIFORM 12" LIFT OF THE FREELY DRAINING MATERIAL (SPEC SECTION 2.03 B) SHALL BE PLACED OVER THE R-TANK AND LIGHTLY COMPACTED USING A WALK-BEHIND TRENCH ROLLER. ALTERNATELY, A ROLLER (MAXIMUM GROSS VEHICLE WEIGHT OF 6 TONS) MAY BE USED. ROLLER MUST REMAIN IN STATIC MODE UNTIL A MINIMUM OF 24" OF COVER HAS BEEN PLACED OVER THE MODULES. SHEEP FOOT ROLLERS SHOULD NOT BE USED. **SPEC SECTION 3.05 A**
2. ONLY LOW PRESSURE TIRE OR TRACK VEHICLES (LESS THAN 7 PSI AND OPERATING WEIGHT OF LESS THAN 20,000 LBS) SHALL BE OPERATED OVER THE R-TANK SYSTEM DURING CONSTRUCTION. **SPEC SECTION 3.05 B**
3. DUMP TRUCKS AND PANS SHALL NOT BE OPERATED WITHIN THE R-TANK SYSTEM AT ANY TIME. WHERE NECESSARY, THE HEAVY EQUIPMENT SHOULD UNLOAD IN AN AREA ADJACENT TO THE R-TANK SYSTEM AND THE MATERIAL SHOULD BE MOVED OVER THE SYSTEM WITH TRACKED EQUIPMENT. **SPEC SECTION 3.05 B**
4. ENSURE THAT ALL UNRELATED CONSTRUCTION TRAFFIC IS KEPT AWAY FROM THE LIMITS OF EXCAVATION UNTIL THE PROJECT IS COMPLETE AND FINAL SURFACE MATERIALS ARE IN PLACE. NO NON-INSTALLATION RELATED LOADING SHOULD BE ALLOWED OVER THE R-TANK SYSTEM UNTIL THE FINAL DESIGN SECTION HAS BEEN CONSTRUCTED (INCLUDING PAVEMENT). **SPEC SECTION 3.05 C**
5. SEE R-TANK INSTALLATION GUIDE OR CONTACT YOUR LOCAL ACF REPRESENTATIVE FOR ADDITIONAL INFORMATION.



CONSTRUCTION EQUIPMENT COVER DETAIL - VEHICULAR TRAFFIC

CONSTRUCTION EQUIPMENT DETAIL–VESICULAR TRAFFIC

N.T.S.

R-TANK SPECIFICATION

PART 1 - GENERAL
1.01 Related Documents
A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section.

1.02 Description of Work Included
A. Provide excavation and base preparation per geotechnical engineer's recommendations and/or as shown on the design drawings, to provide adequate support for project design loads and safety from excavation sidewall collapse. Excavations shall be in accordance with the owner's and OSHA requirements.
B. Provide and install R-Tank^HD, R-Tank^SD, R-Tank^HD, or R-Tank^SD system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, inlet and outlet pipe with connections per the manufacturer's installation guidelines provided in this section.
C. Provide and construct the cover of the R-Tank system including; stone backfill, structural fill cover, and pavement section as specified.
D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.

1.03 Quality Control
A. All materials shall be manufactured in ISO certified facilities.
B. Installation Contractor shall demonstrate to the following experience:
1. A minimum of three R-Tank or equivalent projects completed within 2 years; and,
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
3. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.
C. Installation Personnel: Performed only by skilled workers with satisfactory record of performance on bulk earthworks, pipe, chamber, or pond/landfill construction projects of comparable size and quality.
D. Contractor must have manufacturer's representative available for site review if requested by Owner.

1.04 Submittals
A. Submit proposed R-Tank layout drawings. Drawings shall include typical section details as well as the required base elevation of stone and tanks, minimum cover requirements and tank configuration.
B. Submit manufacturer's product data, including compressive strength and unit weight.
C. Submit manufacturer's installation instructions.
D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.
E. Submit material certificates for geotextile, geogrid, base course and backfill materials.
F. Submit required experience and personnel requirements as specified in Section 1.03.
G. Any proposed equal alternative product substitution to this specification must be submitted for review and approved prior to bid opening. Review package should include third party reviewed performance data that meets or exceeds criteria in Table 2.01 B.

1.05 Delivery, Storage, and Handling
A. Protect R-Tank and other materials from damage during delivery, and store UV sensitive materials under tarp to protect from sunlight when time from delivery to installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris.
B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.
C. Cold weather:
1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated or muddy subgrade.

1.06 Preinstallation Conference.
A. Prior to the start of the installation, a preinstallation conference shall occur with the representatives from the design team, the general contractor, the excavation contractor, the R-Tank installation contractor, and the manufacturer's representative.

1.07 Project Conditions
A. Coordinate installation for the R-Tank system with other on-site activities to eliminate all non-installation related construction traffic over the completed R-Tank system. No loads heavier than the design loads shall be allowed over the system, and in no case shall loads higher than a standard AASHTO HS20 (or HS25, depending on design criteria) load be allowed on the system at any time.
B. Protect adjacent work from damage during R-Tank system installation.
C. All pre-treatment systems to remove debris and heavy sediments must be in place and functional prior to operation of the R-Tank system. Additional pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.
D. Contractor is responsible for any damage to the system during construction.

PART 2 - PRODUCTS
2.01 R-Tank Units
A. R-Tank - Injection molded plastic tank plates assembled to form a 95% void modular structure of predesigned height (custom for each project).
B. R-Tank units shall meet the following Physical & Chemical Characteristics:

PROPERTY	DESCRIPTION	R-Tank^HD VALUE	R-Tank^SD VALUE	R-Tank^HD VALUE	R-Tank^SD VALUE
Void Area	Volume available for water storage	95%	95%	95%	95%
Surface Void Area	Percentage of exterior available for infiltration	90%	90%	90%	90%
Compressive Strength	ASTM D 2412 / ASTM F 2418	50.0 psi	33.4 psi	42.8 psi	134.0 psi
HS-20 Minimum Cover	Cover required to support HS-20 loads	N/A	20"	18"	12" (crosswise)
HS-25 Minimum Cover	Cover required to support HS-25 loads	N/A	24"	18"	15" (crosswise)
Maximum Cover	Maximum allowable cover depth	5 feet	~ 7 feet	< 10 feet	5 feet
Unit Weight	Weight of plastic per cubic foot of tank	3.35 lbs / sf	3.62 lbs/sf	3.96 lbs / sf	4.83 lbs / sf
Rib Thickness	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	N/A
Service Temperature	Safe temperature range for use	-14 – 167° F	-14 – 167° F	-14 – 167° F	-14 – 167° F

C. Supplier: ACF Environmental 2831 Cardwell Road Richmond, VA 23234
(T): 800-448-3636; (F): 804-743-7779 www.acfenvironmental.com

2.02 Geosynthetics
A. Geotextile. A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.
1. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (ACF N080 or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (ACF M200 or equivalent) shall be used.
B. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (ACF BX12 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-Tank^HD installations, and is often not required for non-traffic load applications.

2.03 Backfill & Cover Materials
A. Bedding Materials: Stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System) shall be used below the R-Tank system (3" minimum). Material must be free from lumps, debris, and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation. For infiltration applications bedding material shall be free draining.
B. Side and Top Backfill: Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system. Material must be free from lumps, debris and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.
1. For LD, HD, and SD modules, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).
2. For UD modules in traffic loaded (HS-20) applications with less than 14" of top cover, side backfill materials shall be free draining stone (angular and smaller than 1.0" in diameter). The use of soil backfill on the sides of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of > 14". Top backfill material may be stone or soil as noted above (Section 2.03 B 1).
C. Additional Cover Materials: Structural Fill shall consist of granular materials meeting the gradational requirements of SM, SP, SW, GM, GP or GW as classified by the Unified Soil Classification System. Structural fill shall have a maximum of 25 percent passing the No. 200 sieve, shall have a maximum clay content of 10 percent and a maximum Plasticity Index of 4. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.

2.04 Other Materials
Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

PART 3 - EXECUTION
3.01 Assembly of R-Tank Units
A. Assembly of modules shall be performed in accordance with the R-Tank Installation Manual, Section 2.

3.02 Layout and Excavation
A. Installer shall stake out, excavate, and prepare the subgrade area to the required plan grades and dimensions, ensuring that the excavation is at least 2 feet greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials.
B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.
C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, or other means until construction is complete.
D. Base of the excavation shall be uniform, level, and free of lumps or debris and soft or yielding subgrade areas. A minimum 2,000 pounds per square foot bearing capacity is required.
1. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's engineer.
2. Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.
E. Unsuitable Soils or Conditions: All questions about the base of the excavation shall be directed to the owner's engineer, who will approve the subgrade conditions prior to placement of stone. The owner's engineer shall determine the required bearing capacity of the R-Tank subgrade; however in no case shall a bearing capacity of less than 2,000 pounds per square foot be provided.
1. If unsuitable soils are encountered at the subgrade, or if the subgrade is pumping or appears excessively soft, repair the area in accordance with contract documents and/or as directed by the owner's engineer.
2. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations.
3. Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the owner's engineer.

3.03 Preparation of Base
A. Place a thin layer (3" unless otherwise specified) of bedding material (Section 2.03 A), over the subgrade to establish a level working platform for the R-Tank modules. Level to within ½" (+/- ¼") or as shown on the plans. Native subgrade soils or other materials may be used if determined to meet the requirements of 2.03 A and are accepted by the owner's engineer.
1. Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unyielding.
2. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents.
B. Outline the footprint of the R-Tank system on the excavation floor using spray paint or chalk line to ensure a 2' perimeter is available around the R-Tank system for proper installation and compaction of backfill.

3.04 Installation of the R-Tanks
A. Where a geotextile wrap is specified on the stone base, cut strips to length and install in excavation, removing wrinkles so material lays flat. Overlap geotextile a minimum 12" or as recommended by manufacturer.
B. Where an impervious liner (for containment) is specified, install the liner per manufacturer's recommendations and the contract documents. The R-Tank units shall be separated from impervious liner by a non-woven geotextile fabric installed accordance with Section 3.04A.
C. Install R-Tank modules by placing side by side, in accordance with the design drawings. No lateral connections are required. It is advisable to use a string line to form square corners and straight edges along the perimeter of the R-Tank system. The modules are to be oriented as per the design drawing with required depth as shown on plans.
1. For LD, HD, and SD installations, the large side plate of the tank should be placed on the perimeter of the system. This will typically require that the two ends of the tank area will have a row of tanks placed perpendicular to all other tanks. If this is not shown in the construction drawings, it is a simple field adjustment that will have minimal effect on the overall system footprint. Refer to R-Tank Installation Guide for more details
2. For UD installations, there is no perpendicular end row required.
D. Wrap the R-Tank top and sides in specified geotextile. Cut strips of geotextile so that it will cover the sides and top, encapsulating the entire system to prevent backfill entry into the system. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious liner) during placement.
E. Identify locations of inlet, outlet and any other penetrations of the geotextile (and optional liner). These connections should be installed flush (butted up to the R-Tank) and the geotextile fabric shall be cut to enable hydraulic continuity between the connections and the R-Tank units. These connections shall be secured using pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile, impervious liner (if specified) or pipe. Connecting pipes at 90 degree angles facilitates construction, unless otherwise specified. Ensure end of pipe is installed snug against R-Tank system.
F. Install Inspection and Maintenance Ports in locations noted on plans. At a minimum one maintenance port shall be installed within 10' of each inlet & outlet connection, and with a maximum spacing of one maintenance port for every 2,500 square feet. Install all ports as noted in the R-Tank Installation Guide.
G. If required, install ventilation pipes and vents as specified on drawings to provide adequate ventilation for proper hydraulic performance. The number of pipes and vents will depend on the size of the system. Vents are often installed using a 90 degree elbow with PVC pipe into a landscaped area with "U" bend or venting bollard to inhibit the ingress of debris. A ground level concrete or steel cover can be used.

3.05 Backfilling of the R-Tank Units
A. Backfill and fill with recommended materials as follows:
1. Place freely draining backfill materials (Section 2.03 B) around the perimeter in lifts with a maximum thickness of 12". Each lift shall be placed around the entire perimeter such that each lift is no more than 24" higher than the side backfill along any other location on the perimeter of the R-Tank system. No fill shall be placed over top of tanks until the side backfill has been completed.
2. Each lift shall be compacted at the specified moisture content to a minimum of 95% of the Standard Proctor Density until no further densification is observed (for self-compacting stone materials). The side lifts must be compacted with walk behind compaction equipment. Even when "self-compacting" backfill materials are selected, a walk behind vibratory compactor must be used.
3. Take care to ensure that the compaction process does not allow the machinery to come into contact with the modules due to the potential for damage to the geotextile and R-Tank units.
4. No compaction equipment is permissible to operate directly on the R-Tank modules.
5. Top Backfill:
a. Typical Applications: Install a 12" (or as shown on plans) lift of freely draining material (Section 2.03 B) over the R-Tank Units, maintaining 12" between equipment tracks and R-Tank System.
b. Shallow Applications (< 18" total cover): Install top backfill in accordance with plans.
Lightly compacted using a walk-behind trench roller. Alternately, a roller (maximum gross vehicle weight of 6 tons) may be used. Roller must remain in static mode until a minimum of 24" of cover has been placed over the modules. Sheep foot rollers should not be used.
6. If required, install a geogrid as shown on plans. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
7. Following placement and compaction of the initial cover, subsequent lifts of structural fill (Section 2.03 C) shall be placed at the specified moisture content and compacted to a minimum of 95% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement of fill above the system, unless otherwise specified, a uniform elevation of fill shall be maintained to within 12" across the footprint of the R-Tank system. Do not exceed maximum cover depths listed in Table 2.01 B.
B. Place additional layers of geotextile and/or geogrid at elevations as specified in the design details. Each layer of geosynthetic reinforcement placed above the R-Tank system shall extend a minimum of 3 feet beyond the limits of the excavation wall.
B. Only low pressure tire or track vehicles shall be operated over the R-Tank system during construction. No machinery should drive on top of the tank until a minimum of 18" of backfill and compaction is achieved. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Where necessary the heavy equipment should unload in an area adjacent to the R-Tank system and the material should be moved over the system with tracked equipment.
C. Ensure that all unrelated construction traffic is kept away from the limits of excavation until the project is complete and final surface materials are in place. No non-installation related loading should be allowed over the R-Tank system until the final design section has been constructed (including pavement).
D. Place surfacing materials, such as groundcovers (no large trees), or paving materials over the structure with care to avoid displacement of cover fill and damage to surrounding areas.
E. Backfill depth over R-Tank system must be within the limitations shown in the table in Section 2.01 B. If the total backfill depth does not comply with this table, contact engineer or manufacturer's representative for assistance.

PART 4 - USING THE SYSTEM
4.01 Maintenance Requirements
A. A routine maintenance effort is required to ensure proper performance of the R-Tank system. The Maintenance program should be focused on pretreatment systems. Ensuring these structures are clean and functioning properly will reduce the risk of contamination of the R-Tank system and stormwater released from the site. Pre-treatment systems shall be inspected yearly, or as directed by the regulatory agency and by the manufacturer (for proprietary systems). Maintain as needed using acceptable practices or following manufacturer's guidelines (for proprietary systems).
B. Inspection and/or Maintenance Ports in the R-Tank system will need to be inspected for accumulation of sediments at least quarterly through the first year of operation and at least yearly thereafter. This is done by removing the cap of the port and using a measuring device long enough to reach the bottom of the R-Tank system and stiff enough to push through the loose sediments, allowing a depth measurement.
C. If sediment has accumulated to the level noted in the R-Tank Maintenance Guide or beyond a level acceptable to the Owner's engineer, the R-Tank system should be flushed. A flushing event consists of pumping water into the Maintenance Port and/or adjacent structure, allowing the turbulent flows through the R-Tank system to re-suspend the fine sediments. If multiple Maintenance Ports have been installed, water should be pumped into each port to maximize flushing efficiency. Sediment-laden water can be filtered through a Dirtbag or approved equivalent if permitted by the locality.

R–TANK SPECIFICATION

N.T.S.

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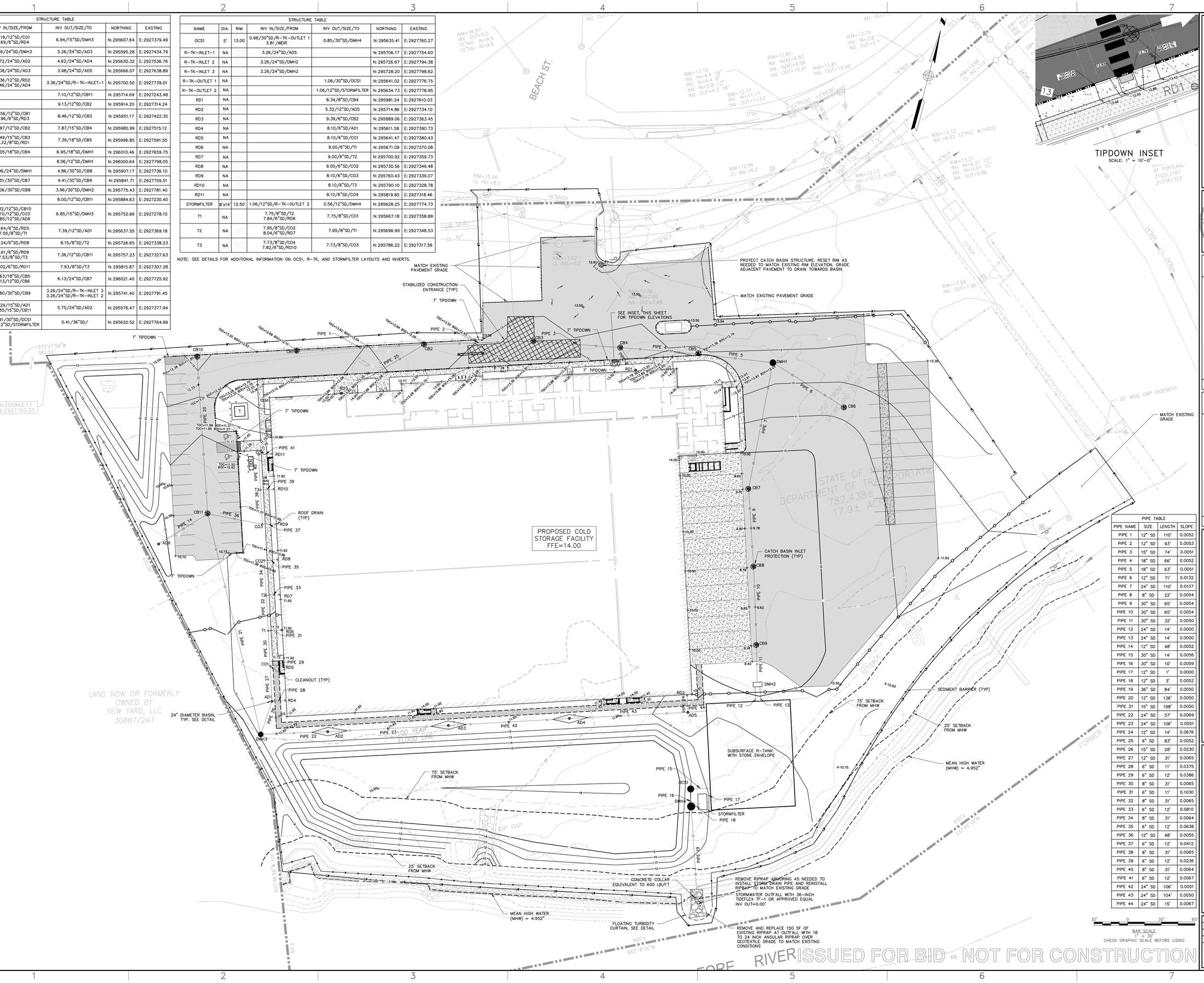
STATE OF MAINE
DARRIN B. STAIRS
No. 15118
LICENSED PROFESSIONAL ENGINEER

#	DESCRIPTION	DATE

STRUCTURE TABLE						
NAME	DIA.	RIM	INV IN/SIZE/FROM	INV OUT/SIZE/TO	NORTHING	EASTING
AD1	2"	10.88	7.19/12"SD/CO1 7.69/6"SD/RD4	6.94/15"SD/DMH3	N: 295607.64	E: 2927379.49
AD2	2"	10.72	5.36/24"SD/DMH3	5.26/24"SD/AD3	N: 295595.28	E: 2927434.79
AD3	2"	10.72	4.72/24"SD/AD2	4.62/24"SD/AD4	N: 295630.32	E: 2927536.76
AD4	2"	10.72	4.08/24"SD/AD3	3.98/24"SD/AD5	N: 295666.07	E: 2927638.89
AD5	2"	10.25	4.36/12"SD/RD2 3.46/24"SD/AD4	3.36/24"SD/R-TK-INLET-1	N: 295700.50	E: 2927739.01
AD6	2"	9.60		7.10/12"SD/CB11	N: 295714.69	E: 2927243.48
CB1	4"	12.10		9.13/12"SD/CB2	N: 295914.20	E: 2927314.24
CB2	5"	12.26	8.56/12"SD/CB1 8.96/6"SD/RD3	8.46/12"SD/CB3	N: 295951.17	E: 2927422.35
CB3	4"	12.45	7.97/12"SD/CB2	7.87/15"SD/CB4	N: 295980.99	E: 2927515.12
CB4	4"	12.60	7.49/15"SD/CB3 8.22/8"SD/RD1	7.39/18"SD/CB5	N: 295996.85	E: 2927591.55
CB5	4"	12.78	7.05/18"SD/CB4	6.95/18"SD/DMH1	N: 296010.46	E: 2927659.75
CB6	4"	11.30		8.06/12"SD/DMH1	N: 296000.64	E: 2927798.05
CB7	5"	9.25	4.96/24"SD/DMH1	4.86/30"SD/CB8	N: 295907.17	E: 2927736.10
CB8	5"	9.10	4.51/30"SD/CB7	4.41/30"SD/CB9	N: 295841.71	E: 2927759.51
CB9	5"	9.10	4.06/30"SD/CB8	3.96/30"SD/DMH2	N: 295775.43	E: 2927781.40
CB10	4"	11.80		8.00/12"SD/CB11	N: 295884.63	E: 2927230.40
CB11	4"	9.99	7.32/12"SD/CB10 7.10/12"SD/CO3 6.85/12"SD/AD6	6.85/15"SD/DMH3	N: 295752.66	E: 2927278.15
CO1	NA	11.10	7.64/6"SD/RD5 7.55/8"SD/T1	7.39/12"SD/AD1	N: 295637.55	E: 2927369.18
CO2	NA	11.70	8.24/6"SD/RD8	8.15/8"SD/T2	N: 295726.65	E: 2927338.23
CO3	NA	11.70	7.61/6"SD/RD9 7.53/8"SD/T3	7.36/12"SD/CB11	N: 295757.23	E: 2927327.63
CO4	NA	11.70	8.02/6"SD/RD11	7.93/8"SD/T3	N: 295815.87	E: 2927307.28
DMH1	5'	12.60	6.63/18"SD/CB5 7.13/12"SD/CB6	6.13/24"SD/CB7	N: 296021.40	E: 2927725.92
DMH2	4'x8'	9.80	3.80/30"SD/CB9	3.26/24"SD/R-TK-INLET 3 3.26/24"SD/R-TK-INLET 2	N: 295741.40	E: 2927791.45
DMH3	4'	11.00	6.29/15"SD/AD1 5.85/15"SD/CB11	5.75/24"SD/AD2	N: 295576.47	E: 2927377.94
DMH4	6"	12.90	0.91/30"SD/OCS1 0.54/12"SD/STORMFILTER	0.41/36"SD/	N: 295620.52	E: 2927764.99

STRUCTURE TABLE						
NAME	DIA.	RIM	INV IN/SIZE/FROM	INV OUT/SIZE/TO	NORTHING	EASTING
OCS1	5'	13.00	0.98/30"SD/R-TK-OUTLET 1 3.81 /WEIR	0.85/30"SD/DMH4	N: 295635.41	E: 2927760.27
R-TK-INLET-1	NA		3.26/24"SD/AD5		N: 295706.17	E: 2927754.60
R-TK-INLET 2	NA		3.26/24"SD/DMH2		N: 295726.67	E: 2927794.38
R-TK-INLET 3	NA		3.26/24"SD/DMH2		N: 295728.20	E: 2927798.62
R-TK-OUTLET 1	NA			1.06/30"SD/OCS1	N: 295641.02	E: 2927776.75
R-TK-OUTLET 2	NA			1.06/12"SD/STORMFILTER	N: 295634.73	E: 2927778.95
RD1	NA			8.34/8"SD/CB4	N: 295981.24	E: 2927610.03
RD2	NA			5.32/12"SD/AD5	N: 295714.86	E: 2927734.10
RD3	NA			9.39/6"SD/CB2	N: 295889.06	E: 2927363.45
RD4	NA			8.10/6"SD/AD1	N: 295611.58	E: 2927390.73
RD5	NA			8.10/6"SD/CO1	N: 295641.47	E: 2927380.43
RD6	NA			9.00/6"SD/T1	N: 295671.09	E: 2927370.08
RD7	NA			9.00/6"SD/T2	N: 295700.92	E: 2927359.73
RD8	NA			9.00/6"SD/CO2	N: 295730.56	E: 2927349.48
RD9	NA			8.10/6"SD/CO3	N: 295760.43	E: 2927339.07
RD10	NA			8.10/6"SD/T3	N: 295790.10	E: 2927328.78
RD11	NA			8.10/6"SD/CO4	N: 295819.85	E: 2927318.46
STORMFILTER	8'x14'	12.50	1.06/12"SD/R-TK-OUTLET 2	0.56/12"SD/DMH4	N: 295628.25	E: 2927774.73
T1	NA		7.75/8"SD/T2 7.84/6"SD/RD6	7.75/8"SD/CO1	N: 295667.18	E: 2927358.89
T2	NA		7.95/8"SD/CO2 8.04/6"SD/RD7	7.95/8"SD/T1	N: 295696.99	E: 2927348.53
T3	NA		7.73/8"SD/CO4 7.82/6"SD/RD10	7.73/8"SD/CO3	N: 295786.22	E: 2927317.56

NOTE: SEE DETAILS FOR ADDITIONAL INFORMATION ON OCS1, R-TK, AND STORMFILTER LAYOUTS AND INVERTS.



PIPE TABLE			
PIPE NAME	SIZE	LENGTH	SLOPE
PIPE 1	12" SD	110'	0.0052
PIPE 2	12" SD	93'	0.0053
PIPE 3	15" SD	74'	0.0051
PIPE 4	18" SD	66'	0.0052
PIPE 5	18" SD	63'	0.0051
PIPE 6	12" SD	71'	0.0132
PIPE 7	24" SD	110'	0.0107
PIPE 8	8" SD	22'	0.0054
PIPE 9	30" SD	65'	0.0054
PIPE 10	30" SD	65'	0.0054
PIPE 11	30" SD	32'	0.0050
PIPE 12	24" SD	14'	0.0000
PIPE 13	24" SD	14'	0.0000
PIPE 14	12" SD	48'	0.0052
PIPE 15	30" SD	14'	0.0056
PIPE 16	30" SD	10'	0.0059
PIPE 17	12" SD	1'	0.0000
PIPE 18	12" SD	3'	0.0052
PIPE 19	36" SD	84'	0.0050
PIPE 20	12" SD	136'	0.0050
PIPE 21	15" SD	198'	0.0050
PIPE 22	24" SD	57'	0.0069
PIPE 23	24" SD	106'	0.0051
PIPE 24	12" SD	14'	0.0676
PIPE 25	6" SD	83'	0.0052
PIPE 26	15" SD	28'	0.0230
PIPE 27	12" SD	31'	0.0065
PIPE 28	6" SD	11'	0.0375
PIPE 29	6" SD	12'	0.0386
PIPE 30	8" SD	31'	0.0065
PIPE 31	6" SD	11'	0.1030
PIPE 32	8" SD	31'	0.0065
PIPE 33	6" SD	12'	0.0810
PIPE 34	8" SD	31'	0.0064
PIPE 35	6" SD	12'	0.0638
PIPE 36	12" SD	48'	0.0055
PIPE 37	6" SD	12'	0.0412
PIPE 38	8" SD	31'	0.0065
PIPE 39	6" SD	12'	0.0236
PIPE 40	8" SD	31'	0.0064
PIPE 41	6" SD	12'	0.0067
PIPE 42	24" SD	106'	0.0051
PIPE 43	24" SD	104'	0.0050
PIPE 44	24" SD	15'	0.0067

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
A	ISSUED FOR BID	5-29-2020
B	90% DRAWING & PROGRESS SET	4-28-2020
C		
D		
E		
F		

DESIGNED BY: ANL DRAWN BY: BDM CHECKED BY: DS

GRADING, DRAINAGE AND EROSION CONTROL PLAN

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL
COLD STORAGE FACILITY

JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 5 OF ---

C-101

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WEST COMMERCIAL STREET
U.S. ROUTE 1A
PAVED – PUBLIC – VARIABLE WIDTH

BEACH ST

REBUILD SEWER MANHOLE BRICK INVERT AS NEEDED
CORE AND BOOT 6" SEWER SERVICE CONNECTION TO EXISTING SEWER MANHOLE FIELD VERIFY EXISTING SEWER INVERT
73 LF, 6" SDR-35 SANITARY LINE. S=0.029
EXISTING 4" SHUT-OFF WATER VALVE AT PROPERTY LINE
EXISTING 4" DOMESTIC WATER SERVICE
EXISTING METER VAULT
ABANDONED 4" GAS LINE
SMH1
RIM=12.73
6" INV. IN=5.25
6" INV. OUT=5.15
41 LF 6" SDR 35 SANITARY LINE S=0.010
TEST PIT
6" FIRE PROTECTION SERVICE, CONNECT TO EXISTING 6" WATERMAIN
ELECTRICAL SERVICE SEE ELECTRICAL PLANS
ELECTRICAL MANHOLE
EXISTING 4" DOMESTIC WATER SERVICE
OVERHEAD ELECTRICAL AND NEW POLES SET BY CMP
TEST PIT
TELECOM SERVICE
3" DOMESTIC WATER SERVICE
3" DOMESTIC WATER SHUT-OFF VALVE
TRANSFORMER, SEE ELECTRICAL PLANS
ROUTE UNDERGROUND WIRING FOR TYPE S4A POLE LIGHTING BELOW SIDEWALK TO AVOID FIRE HYDRANT
NEW FIRE HYDRANT ASSEMBLY
6" FIRE SERVICE
6" BUILDING SEWER INV. OUT=5.66
6" FIRE PROTECTION SHUT-OFF VALVE
3" DOMESTIC WATER SERVICE INV. IN=7.50
6" FIRE PROTECTION WATER SERVICE INV. IN=7.50
OVERHEAD LIGHTING, SEE LIGHTING PLAN (TYP)
GENERATOR, SEE ELECTRICAL PLANS
LIGHTING CONDUIT, SEE ELECTRICAL PLANS
PROPOSED COLD STORAGE FACILITY FFE=14.00
ROOFTOP MOUNTED SOLAR PANELS (TYP) BY OTHERS
GAS METER LOCATION, SEE PLUMBING PLANS FOR COORDINATION
2" GAS SERVICE
CONNECT TO EXISTING 2" PLASTIC GAS MAIN
TEST PIT
RAISE EXISTING GAS VALVE CAPS TO GRADE, COORDINATE WITH UNITIL
SUBSURFACE STORMWATER TREATMENT SYSTEM (SEE SHEET C-101)
75' SETBACK FROM MHW
25' SETBACK FROM MHW
MEAN HIGH WATER (MHW) = 4.952'
100 YEAR FLOOD LINE
250' FROM H.A.T. FLOOD ZONE
20' WIDE CMP EASEMENT
30' WIDE SEWER EASEMENT TO CITY OF PORTLAND 31021/187 31378/333
HIGHEST ANNUAL TIDE LINE ELEVATION 7.2 NGVD 1929
FORMER HARBOR COMMISSIONERS LINE OF 1915
LAND NOW OR FORMERLY OWNED BY NEW YARD, LLC 30887/247
FORE RIVER

N:295843.13
E:2927103.20
N:295526.82
E:2927402.54

PLAN NOTES:

1. ANY RELOCATION OF UTILITIES REQUIRE PRIOR TO, OR DURING CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE CITY OF PORTLAND, ASSOCIATED UTILITY COMPANIES, AND ADJACENT PROPERTY OWNERS.
2. FINAL SERVICE ENTRANCES OF UTILITIES TO BE COORDINATED AS BUILDING DESIGN PROGRESSES.

30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

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STATE OF MAINE
DARRIN B. STAIRS
No. 15118
LICENSED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
A	ISSUED FOR BID	5-29-2020
B	90% PERMITTING COMMENTS	7-28-2020
C	90% PERMITTING PROGRESS SET	7-31-2020

DESIGNED BY: ANL | DRAWN BY: BDM/JP | CHECKED BY: DS

UTILITY PLAN

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 6 OF --

C-102

\\woodardcurran.net\shared\Projects\0232277.00 Maine Port Authority Cold Storage Warehouse\wip\Drawings\Civil\0232277.00 C102.dwg, Jul 31, 2020 - 2:29pm

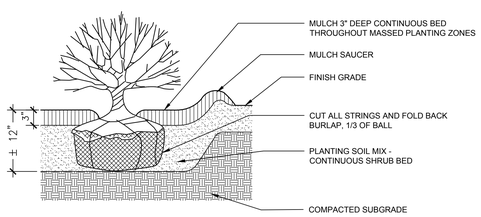
PLANT SCHEDULE -STREET TREES					
QUANT.	SYM.	BOTANICAL NAME	COMMON NAME	SIZE	
3	AC	AMELANCHIER CANADENSIS AUTUMN BRILLIANCE	SHADBLOW	6-7' MULTI, B&B	
5	AS	ACER SACCHARUM	SUGAR MAPLE	3"-3.5" CAL, B&B	
3	AR	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	3"-3.5" CAL, B&B	
18	BN	BETULA NIGRA	RIVER BIRCH	8-10' MULTI, B&B	
5	CA	CLETHRA ALNIFOLIA 'RUBY SPICE'	SUMMER SWEET	#7 CONT	
4	GT	GLEDITSIA TRIACANTHOS F. INERMIS	THORNLESS HONEYLOCUST	3"-3.5" CAL, B&B	
41	MP	MYRICA PENSYLVANICA	NORTHERN BAYBERRY	3.5'-4' HT, B&B	
24	PV	PANICUM VIRGATUM 'NORTHWIND'	SWITCH GRASS	#2 CONT.	
12	PG	PICEA GLAUCA	WHITE SPRUCE	7-8' HT., B&B	
11	PO	PICEA OMORIKA	SERBIAN SPRUCE	7-8' HT., B&B	
11	PP	PINUS PARVIFLORA 'GLAUCA'	JAPANESE WHITE PINE	7-8' HT., B&B	
19	RA	RHUS AROMATICA 'GRO-LOW'	FRAGRENT SUMAC	#3 CONT	
24	RB	RHODODENDRON 'BOULE DE NEIGE'	RHODODENDRON	2.5'-3' HT., CONT	
6	RM	RHODODENDRON MAXIMUM 'ROSEUM'	RHODODENDRON	3.5'-4' HT, CONT	
29	SS	SCHIZACHYRIUM SCOPARIUM 'PRAIRIE BLUES'	BLUE STEM	#2 CONT	
1,065 SF	TN	THELYPTERIS NOVEBORACENSIS	NEW YORK FERN	SOD	
3	VP	VIBURNUM PLICATUM F. TOMENTOSUM 'SHASTA'	DOUBLEFILE VIBURNUM	3.5'-4' HT, CONT	
6	QR	QUERCUS RUBRA	RED OAK	3"-3.5" CAL, B&B	



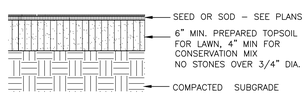
PLANTING NOTES

1. CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING AND SHALL CONTINUE UNTIL FINAL ACCEPTANCE BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF WATERING AND MAINTENANCE.
2. CONTRACTOR SHALL SUPPLY PLANTS IN QUANTITIES SUFFICIENT TO COMPLETE WORK SHOWN ON THE PLAN. ANY DISCREPANCY BETWEEN THE QUANTITIES SHOWN IN THE PLANT SCHEDULE AND THOSE REQUIRED ON THE PLAN SHALL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL RENUMERATION. ANY DISCREPANCIES SHALL BE CLARIFIED WITH THE LANDSCAPE ARCHITECT PRIOR TO ORDERING PLANT MATERIAL.
3. ALL MATERIALS SHALL CONFORM TO SPECIFICATIONS OF THE AMERICAN STANDARDS FOR NURSERY STOCK (LATEST EDITION) AS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS THE ORIGINAL GRADES BEFORE DIGGING.
5. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
6. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT AT THE NURSERY AND AT THE SITE.
7. ALL PLANT BEDS SHALL MEET MINIMUM TOPSOIL REQUIREMENTS (SEE SPECIFICATIONS + NOTE #19 BELOW).
8. NO PLANT MATERIAL SHALL BE INSTALLED UNTIL GRUBBING, BED PREPARATION, AND FINISH GRADING HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
9. ALL PLANTS BEDS AND TREE WELLS SHALL HAVE A MINIMUM OF 3" OF UNIFORMLY DISTRIBUTED, DARK, SHREDDED BARK MULCH. ALL SHRUBS BED SHALL BE CONTINUOUS (WITH PLANTING SOIL MIX AND BARK MULCH).
10. CONTRACTOR SHALL SUBMIT SOIL SAMPLE AND TEST OF TOPSOIL TO LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. SOIL ADMIXTURE SHALL BE ADDED TO EXISTING SOIL (BY CONTRACTOR) IF DEEMED NECESSARY BY SOIL TEST RESULTS.
11. ROUGH GRADING AND BED PREPARATION SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO PLANT INSTALLATION. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT 48 HOURS PRIOR TO REQUIRED SITE VISIT.
12. ALL PLANTS SHALL BE BALLED AND WRAPPED OR CONTAINER GROWN AS SPECIFIED. ALL ROOT WRAPPING AND CONTAINER MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED AT THE TIME OF PLANTING.
13. ALL BROAD LEAF EVERGREEN PLANTS SHALL BE SPRAYED WITH AN ANTI-DESSICANT AT THE BEGINNING OF THEIR FIRST WINTER.
14. ALL PLANTS SHALL BE INSTALLED AS PER DETAILS AND THE CONTRACT SPECIFICATIONS. THE LANDSCAPE CONTRACTOR SHALL REFER TO THE CONTRACT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
15. CONTRACTOR SHALL STAKE TREES.
16. THE LANDSCAPE CONTRACTOR SHALL PROVIDE TOPSOIL FILL AS PER THE CONTRACT SPECIFICATIONS + NOTE #19.
17. ALL PLANTS SHALL BE WATERED BY THE CONTRACTOR, AS NECESSARY TO INSURE HEALTH UNTIL FINAL ACCEPTANCE.
18. THE LANDSCAPE CONTRACTOR SHALL REFER TO THE PLANT LIST AND PLANTING SPECIFICATIONS FOR SEASONAL REQUIREMENTS AND OTHER RESTRICTIONS RELATED TO THE TIME AND SEASON OF PLANTING.
19. PLANTING SOIL MIX: 1 PART COMPOST, 8 PARTS TOPSOIL, 3 PARTS HUMUS.
    TOPSOIL: FERTILE, FRIABLE, NATURAL TOPSOIL OF LOAMY CHARACTER, WITHOUT ADMIXTURE OF SUBSOIL MATERIAL, FREE FROM CLAY, LUMPS, COARSE SANDS, STONES, PLANTS, ROOTS, STICKS, AND OTHER FOREIGN MATERIALS GREATER THAN 1" IN ANY DIMENSION, PH RANGE 5.0-7.0 , AND SHALL CONTAIN NOT LESS THAN 6% ORGANIC MATTER BY WEIGHT.
    SANDY LOAM OR LOAM SOIL AS DEFINED BY THE USDA SOIL CONSERVATION SERVICE, AND HAVE THE FOLLOWING MECHANICAL ANALYSIS:

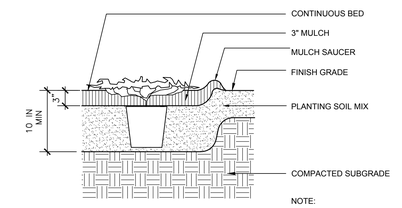
TEXTURAL CLASS	% OF TOTAL WEIGHT	AVERAGE %
SAND (0.05- 2.0 MM)	45 TO 75%	60%
SILT (0.002- 0.05 MM)	15 TO 35%	25%
CLAY (< 0.002 MM)	5 TO 25%	15%



1 SHRUB PLANTING
SCALE: N.T.S

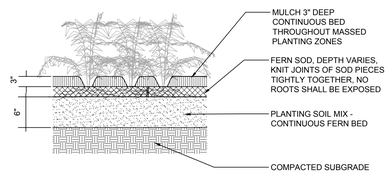


2 LAWN
SCALE: N.T.S

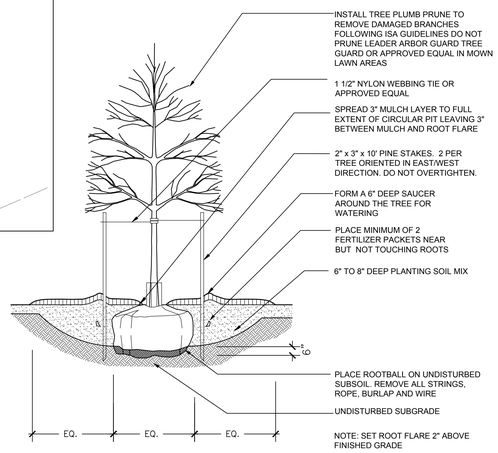


NOTE:
1. PLANT GOUNDCOVER IN STAGGERED ROWS

3 GROUND COVER PLANTING
SCALE: N.T.S



4 FERN SOD
SCALE: N.T.S



5 TREE PLANTING
SCALE: N.T.S

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LICENSED LANDSCAPE ARCHITECT
PATRICK J. CARROLL NO. 127
STATE OF MAINE

REV	DESCRIPTION	DATE

DESIGNED BY: EPK | DRAWN BY: EPK | CHECKED BY: PC

REV	DESCRIPTION	DATE
5	RESPONSE TO PLANNING BOARD COMMENTS	9.29.2020
4	PERMITTING	7.27.2020
3	ISSUE FOR BID	6.23.2020
2	RESPONSE TO CITY COMMENTS	5.13.2020

LANDSCAPE PLAN

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND,MAINE

MAINE INTERNATIONAL COLD STORAGE FACILITY

JOB NO.: 0232277.00
DATE: MAY 2020
SCALE: AS NOTED
SHEET: 1 OF 1

L-1.0

11. CONSTRUCTION MANAGEMENT PLAN

A Construction Management Plan has been prepared by Woodard & Curran for the proposed development. The Contractor will be required to provide adequate safety fencing and signage directing pedestrians safely around the construction area. The Construction Management Plan is attached to this Section for your reference.

11.1 ATTACHMENTS

- Construction Management Plan prepared by Woodard & Curran (Uploaded to the Construction Management Plan folder on Eplan)

MAINE INTERNATIONAL COLD STORAGE FACILITY (MICSF)

Construction Management Plan

41 Hutchins Drive
Portland, ME 04102
1-207-774-2112

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

Last Updated:
July 30, 2020

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A. CONSTRUCTION MANAGEMENT PRINCIPLES

This construction management plan (CMP) will outline the typical construction management principles used to minimize the construction related impacts to traffic, businesses, and communities during the construction of a cold storage facility located adjacent to the intersection of Beach Street and Commercial Street. Woodard and Curran are committed to working in concert with the City of Portland to deliver a project focused on communication, and the safety of project personnel and the surrounding community.

The cold storage facility will incorporate an insulated structural concrete foundation constructed over driven piles and be vertically constructed utilizing a structural steel frame with insulated metal panel siding. The building will be approximately 108,000 total square feet and comprised of roughly 91,000 square feet space for offloading and cold storage, 13,000 square feet of administrative space, and 4,000 square feet of mechanical and utility space.

Throughout this CM plan we will propose management considerations for traffic control, communication with adjacent business and general public safety during construction. We will be diligent in our efforts to meet all City and State requirements and will require participation from all appropriate parties to ensure all standards are being met.

B. DEVELOPMENT REVIEW OF CONSTRUCTION MANAGEMENT PLAN

Woodard and Curran will update the CMP on a quarterly basis to ensure all requirements are being met as the project progresses. The primary focus of updates will include:

- Construction schedule updates
- Project team personnel updates and contact information
- Updates to the site-specific Health and Safety Plan (HASP)
- Notification of any material changes to the established CMP
- Notification of activities that pose an increase to noise or dust to surrounding businesses and neighboring communities
- Anticipated material deliveries and/or high-volume construction activities with a potential impact to both public and private traffic patterns
- Requests for off-hours work as applicable (extended hours, and/or weekends and holiday work)

C. PERFORMANCE GUARANTEES, INSPECTION FEES, PRECONSTRUCTION MEETING, AND PERMITS

Performance guarantees: As referenced in construction contracts and the basis of design

Inspection fees: To be commensurate with City of Portland's standard fee structure for proposed design.

Preconstruction meeting: Project team to participate in all procedural preconstruction meetings required throughout permitting and construction.

Permits:

Street Opening Permits: Sewer, gas and water are all stubbed into the extents of the project site and the electrical tie-in is anticipated to be competed at an existing pole located off West Commercial street; street opening permits will not be required for these utility connections. Additionally, stormwater will be discharged through an outfall to the River

Street Occupancy Permit: the entrance to the project site is located off West commercial street and the site management plan provides ample room within the project site for construction vehicle staging, contractor parking, and material laydown. A street occupancy permit is not anticipated to be needed with this proposed CMP.

Blasting Permit: Blasting is not anticipated for this project

D. CONSTRUCTION ADMINISTRATION AND COMMUNICATION

Woodard and Curran will work in conjunction with this CMP and all appropriate parties to communicate and minimize any foreseeable construction related impacts to the surrounding businesses and communities. Communication targeted for the local community with be performed as needed depending on the duration and potential impact. Woodard and Curran may communicate these potential impacts through letters and activity specific signage, as well as individual or group meetings.

Project meetings during permitting and design phase: TFIC and Woodard and Curran will continue regular (weekly) project meetings with all respective design team members and project managers to ensure all City and State requirements are being coordinated. Client and contractor-based project meetings will be scheduled when the project transitions into the construction phase. Meeting times, frequency and participants will be updated accordingly in the revised CMP

Construction site signage will be used at the project site and any areas immediately adjacent that help convey when and where neighboring businesses, pedestrians, and commuters can expect to encounter project related activities. Typical construction site signage will include (and not limited to): Construction related traffic patterns, restricted access areas, appropriate contact information for the project team, and emergency procedures.

Contact information during the design and preconstruction phase**:**

Jedd Steinglass, Woodard and Curran	Project/Design Manager	(207) 756-2319
Gregory Roy, Woodard and Curran	Construction Manager	(207) 251-1736

Contact information during construction phase (Designated upon progression to construction phase).

E. CONSTRUCTION SCHEDULE

Constructions activities are expected to fall withing normal working hours of 7:00am to 5:00pm Monday through Friday. Any considerations outside of these hours will be communicated through proper channels; typical consideration for extended hours would include (but not limited to): maximizing daylight work hours at certain times of the year, protection of personnel during extreme temperatures, critical activities that require substantial set-up and /or process time (ex: crane work, concrete work).

MILESTONE SCHEDULE

Milestone	Start Date	End Date
Design	8/2019	6/2020
Permitting	10/2019	10/2020
Pre-construction and contracting	5/2020	11/2020

Milestone	Start Date	End Date
Mobilization and Site Prep	11/2020	12/2021
Construction	12/2020	6/2022
Close-out	6/2022	9/2022

F. SECURITY & PUBLIC SAFETY

The site will be fully fenced to its adjacent properties and along West commercial street. Existing site fencing will remain and be supplemented with new temporary fence as needed to properly create public awareness and safeguard the project site. Regular interactions with pedestrians are not anticipated based on the project location but signage will be placed along the fence line to clearly identify and inform the community of the boundaries and restrictions associated with the project site.

A twenty-foot fenced gate located within the shared IMP access will provide the primary means of access to the site, another gate will be installed to the south of the abutting gas building to provide secondary access to the rear of the property. Emergency contact information will be posted at all project entrances and inside of the construction site as part of the site-specific Health and Safety Plan.

Good housekeeping across the project site and inside of the built structure will serve as the basis for our life safety and emergency action plan. Maintaining clear avenues of egress and approach is paramount to effectively responding to emergencies on the project site.

Temporary lighting layout has not been defined at this time but may be included in a revised CMP. Temporary lighting may be fixed or portable.

The project will employ a site camera(s) to help document construction progress and provide additional visibility and security for the project. Security personnel are not expected to be required at this time but may be considered as the project progresses.

G. CONSTRUCTION PERMITTING AND TRAFFIC CONTROL

All construction activities are limited to the project site and the shared access serving the International Marine Terminal (IMT). Work outside of these areas or on West Commercial street is not anticipated. Signage will be utilized where appropriate to properly convey the extent of construction activities and regular construction traffic patterns in the vicinity of the project site.

The project location and site access will allow construction related traffic to readily enter the project site after leaving West Commercial street. Street occupancy permits are not expected to be needed during construction. Any specific activity that does pose an anticipated interruption to normal traffic patterns immediately adjacent to the project site will be evaluated, communicated, permitted, and coordinated as to lessen the overall impact on the community.

All construction related deliveries will access the project site either via the Veterans Memorial Bridge -West Commercial street, or via 295/Franklin Street-Commercial Street

H. SITE MANAGEMENT AND CONTROLS

Reference the attached site management plan.

Site access: The project site will be defined, and access will be restricted by way of chain link fencing and two gates. The gates will be locked outside of designated work hours.

Site Layout: The site will have a primary right of way around the building footprint for construction related access and travel, two primary laydown areas, dumpsters (emptied as-needed), a designated area for spoils management, Conex box storage, contractor parking, staging areas, and

Soils Management: Soils excavated during the construction will be managed and re-purposed on site to the extent possible. A construction entrance will be established and maintained to minimize the spread of soils into the shared access to the site and onto West commercial street. Street sweeping will be employed on regular and/or as needed basis.

Dust Controls: Site soil disturbed during construction work shall be handled and maintained to minimize the creation and dispersion of visible dust. Dust suppression shall be conducted through regular sweeping and sprinkling of water, as necessary, and/or with an appropriate commercial grade dust suppressant. Stockpiled and otherwise disturbed soils shall be maintained in a condition that prevents generation and migration of dust as described in the Stockpile Management section below. Areas of attention for dust control include but are not necessarily limited to active excavation areas, haul roads, active soil stockpiles and loading areas, entrances and exits to the site, and adjacent public roadways. Truck tires and equipment will be inspected and cleaned as necessary prior to leaving the site.

Noise and Vibration Controls: Typical construction related noise will be limited to normal working hours and is not expected to disrupt neighboring businesses. Noise and vibration related to pile driving will also be limited to normal working hours, Woodard and Curran expects to notify the neighboring businesses of the anticipated start and duration for pile driving. Meetings to discuss the potential noise and vibration impacts with the affected businesses will be coordinated as needed. Noise and vibration monitoring are not anticipated at this time but can be incorporated into the CMP as required.

Woodard and Curran will be responsible for snow removal within the defined project limits and as required to maintain access into the project access gates.

I. EROSION CONTROL AND PRESERVATION OF TREES

Reference the attached site management plan and the Storm Water Management Report. All installed erosion control measures will be monitored on a regular basis and repaired as needed to ensure they are effectively performing as intended. Formal inspection will be conducted on a weekly basis, and after any significant storms or other events that would feasibly compromise the protections.

Preservation of specific trees and existing vegetation will be in accordance with the site and landscaping drawings

J. CONSTRUCTION STAGING AREA

Reference the attached site management plan. The project site has adequate room for all anticipated construction staging.

K. PARKING DURING CONSTRUCTION

Reference the attached site management plan. The project site has adequate room for all anticipated construction parking.

L. DEWATERING PLANS

Dewatering / Groundwater Management: It is not anticipated that groundwater will be encountered during excavation activities. Storm water and water used for dust control shall be allowed to infiltrate on-site. Any standing water that must be pumped to allow the continuation of construction activities will be discharged to a designated location designed specifically to best mitigate soil erosion and promote the settling of solids.

M. SPECIAL MEASURES AS NECESSARY

There are no special measures identified for this project.

N. ATTACHMENTS

A. Site Management Plan

O. LIST OF REVISIONS

Woodard & Curran, Inc. – MPA Cold Storage Facility			
Revision Number	**Revision Date**	**Section Revised**	**Comment**
Revision 1	7/30/2020	E: Schedule G: Traffic Control	Revised for pandemic/permitting delays Added language about site deliveries
Revision 2			



BUILDING LAYOUT TABLE		
Point #	Northing	Easting
1	295867.99	2927302.55
2	295598.18	2927396.04
3	295716.89	2927718.20
4	295918.16	2927668.36
5	295931.97	2927718.02
6	295990.23	2927867.81
7	295977.23	2927650.34
8	295992.66	2927644.98
9	295911.91	2927412.25
10	295906.32	2927414.19

CONSTRUCTION MANAGEMENT PLAN ATTACHMENT A

ISSUED FOR BID - NOT FOR CONSTRUCTION

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STATE OF MAINE — DARRIN B. STAIRS — No. 15118 — REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
3	100/70 (100%)	
2		
1	CHECKED BY: DS	

REV	DESCRIPTION	DATE
C	ISSUED FOR BID	5-29-2020
B	75% CITY COMMENTS	4-28-2020
A	90% DRAWING PROGRESS SET	3-26-2020

DESIGNED BY: ANL | DRAWN BY: BDM/JSF

MAINE INTERNATIONAL COLD STORAGE FACILITY (MICSF)
SITE MANAGEMENT PLAN

MAINE INTERNATIONAL COLD STORAGE FACILITY
PORTLAND, MAINE

MAINE INTERNATIONAL
COLD STORAGE FACILITY

JOB NO.:0232277.00
DATE: JULY 2020
SCALE: AS NOTED
SHEET: 4 OF --

C-100

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ARCHITECTURE | INTERIOR DESIGN
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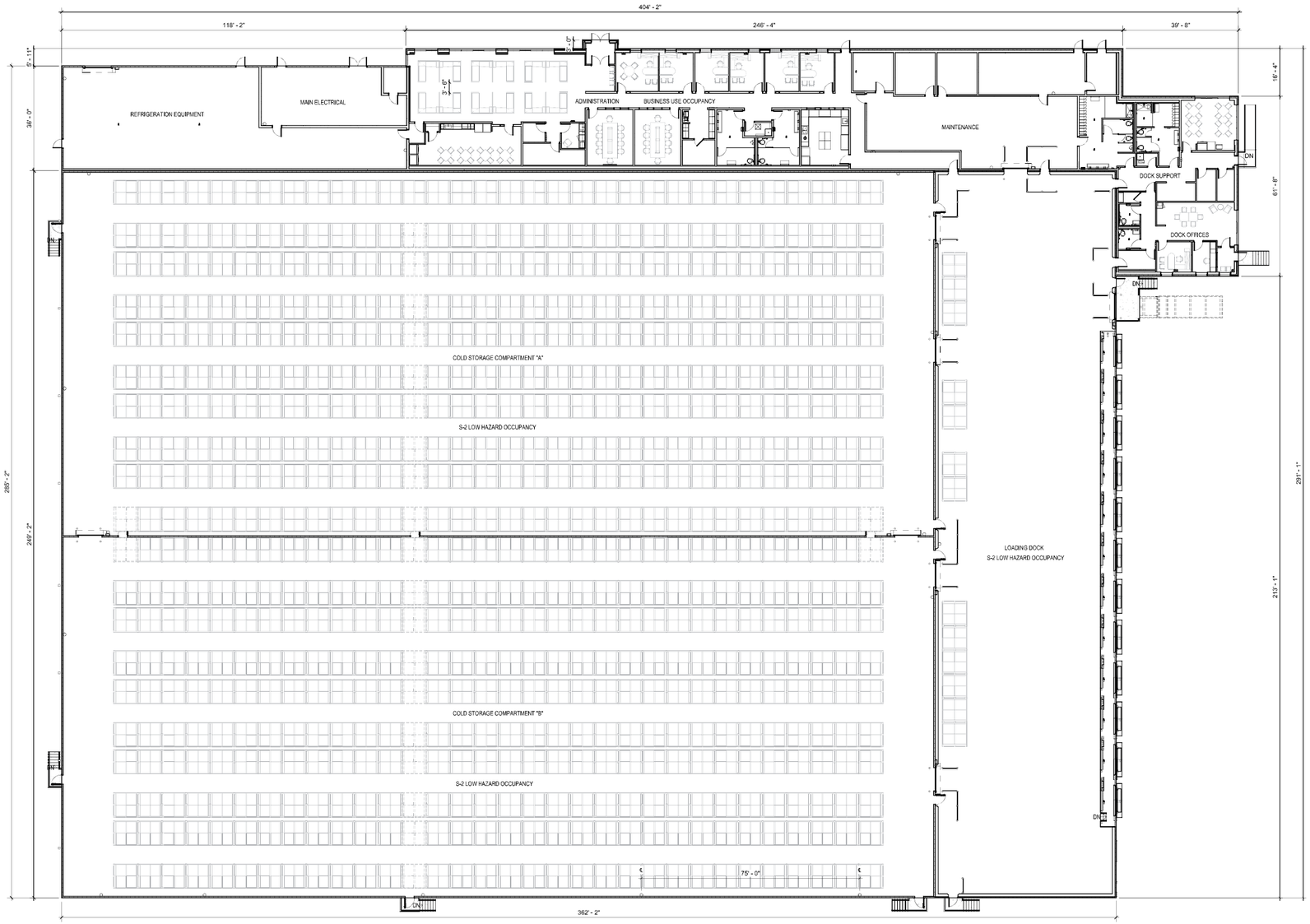
Scarborough, ME 04074
(207) 774-4441

PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

FLOOR PLAN



True North

Plan North

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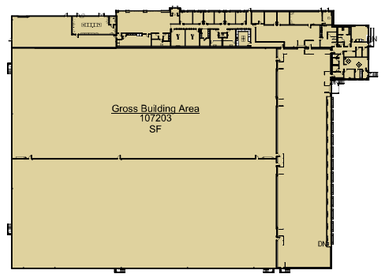
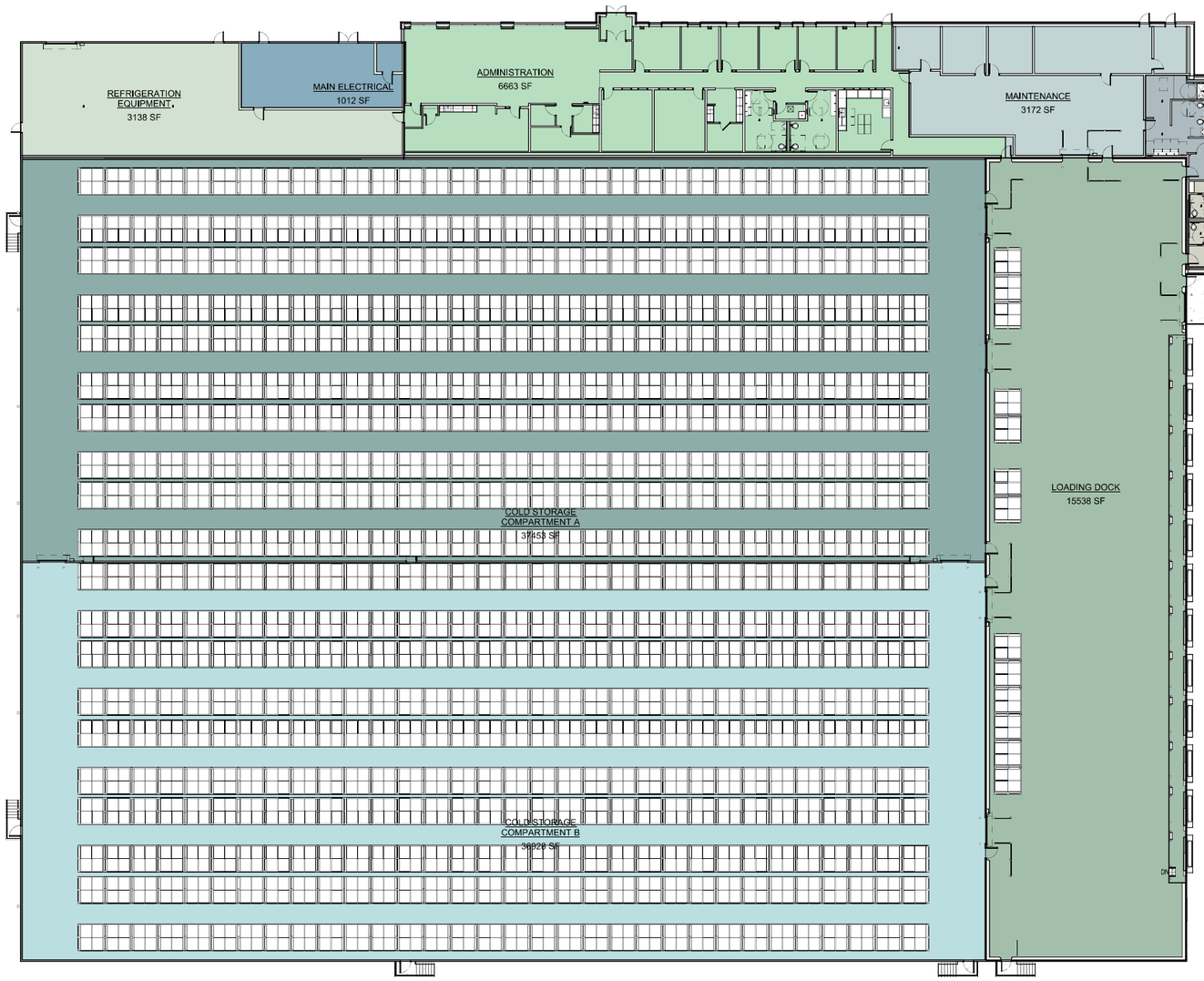
PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

AREA FLOOR PLAN





True North
Plan North

COLD STORAGE COMPARTMENT A: 10,196 PALLET POSITIONS
COLD STORAGE COMPARTMENT B: 10,192 PALLET POSITIONS

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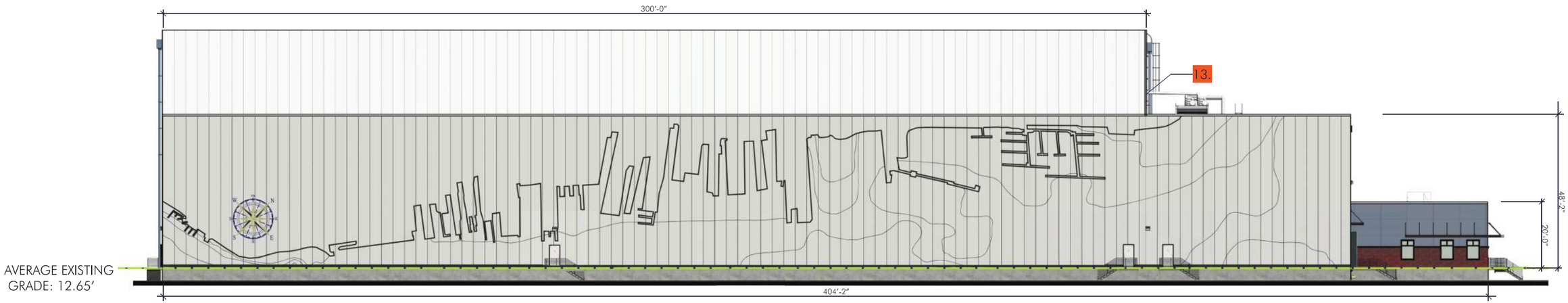
PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

BUILDING ELEVATIONS

1. INSULATED METAL PANEL - COLOR NO. 1 - OFF WHITE
2. INSULATED METAL PANEL - COLOR NO. 2 - CHARCOAL
3. INSULATED METAL PANEL - COLOR NO. 3 - DUSTY BLUE
4. INSULATED METAL PANEL - COLOR NO. 4 - LIGHT GRAY
5. METAL DOWNSPOUT
6. ALUMINUM STOREFRONT WINDOW SYSTEM
7. OVERHEAD DOORS AND DOOR SEAL ASSEMBLIES BEYOND
8. TPO ROOFING SYSTEM BEYOND
9. RED NARROW FLASHED MODULAR BRICK WAINSCOT WITH PRECAST CONCRETE CAP
10. EXPOSED CONCRETE FOUNDATION SYSTEM
11. SCREENING AT TALLER ROOF TOP EQUIPMENT
12. MAXIMUM BUILDING HEIGHT AS MEASURED ABOVE THE AVERAGE GRADE SHALL BE 73'-10".
13. TOP OF PENETRATION 57'-0" FROM TOP OF AVERAGE GRADE.



NORTH ELEVATION



SOUTH ELEVATION

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PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

BUILDING ELEVATIONS

1. INSULATED METAL PANEL - COLOR NO. 1 - OFF WHITE
2. INSULATED METAL PANEL - COLOR NO. 2 - CHARCOAL
3. INSULATED METAL PANEL - COLOR NO. 3 - DUSTY BLUE
4. INSULATED METAL PANEL - COLOR NO. 4 - LIGHT GRAY
5. METAL DOWNSPOUT
6. ALUMINUM STOREFRONT WINDOW SYSTEM
7. OVERHEAD DOORS AND DOOR SEAL ASSEMBLIES BEYOND
8. TPO ROOFING SYSTEM BEYOND
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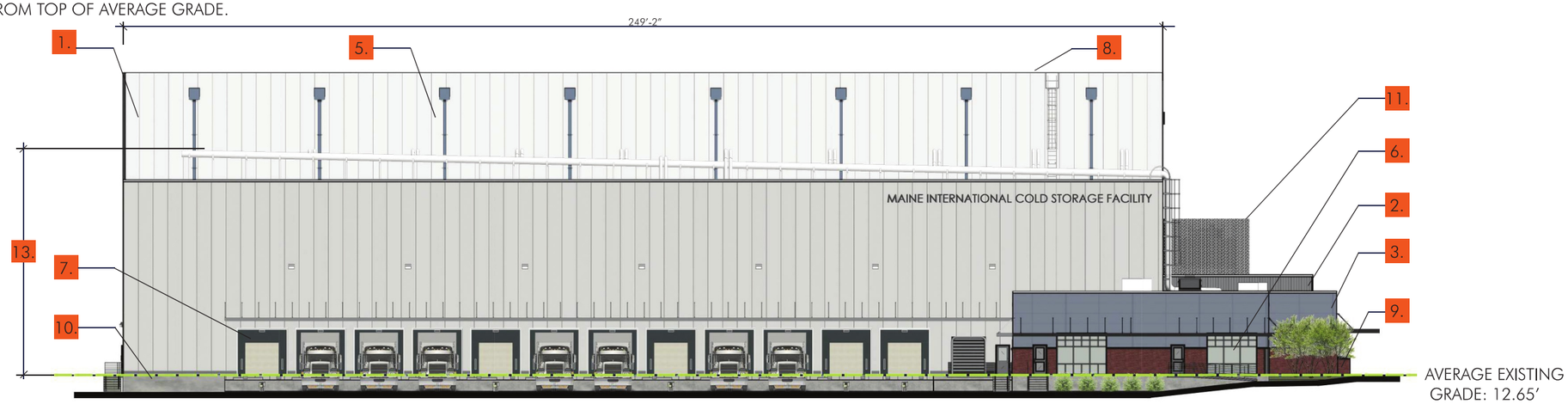

EAST ELEVATION



WEST ELEVATION

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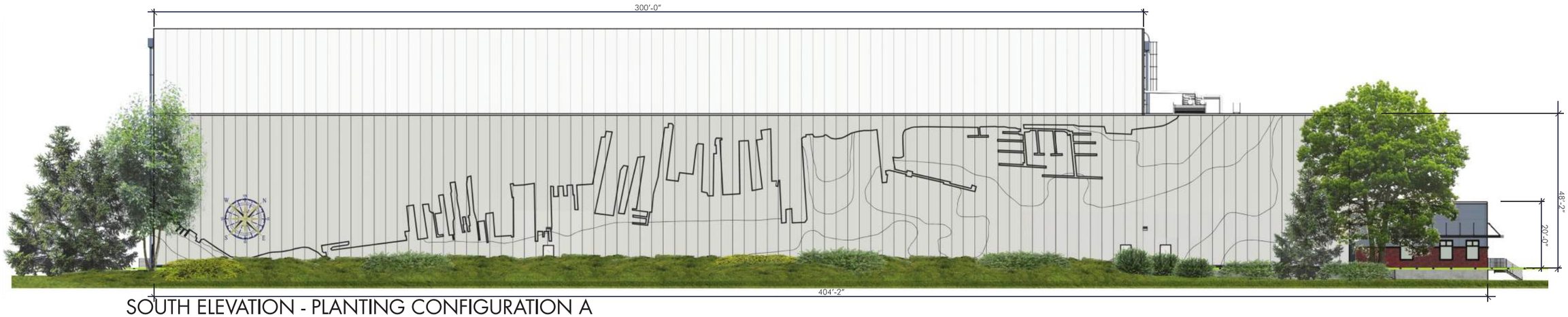
PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

SOUTH WALL ELEVATIONS



SOUTH ELEVATION - PLANTING CONFIGURATION A



SOUTH ELEVATION - PLANTING CONFIGURATION B

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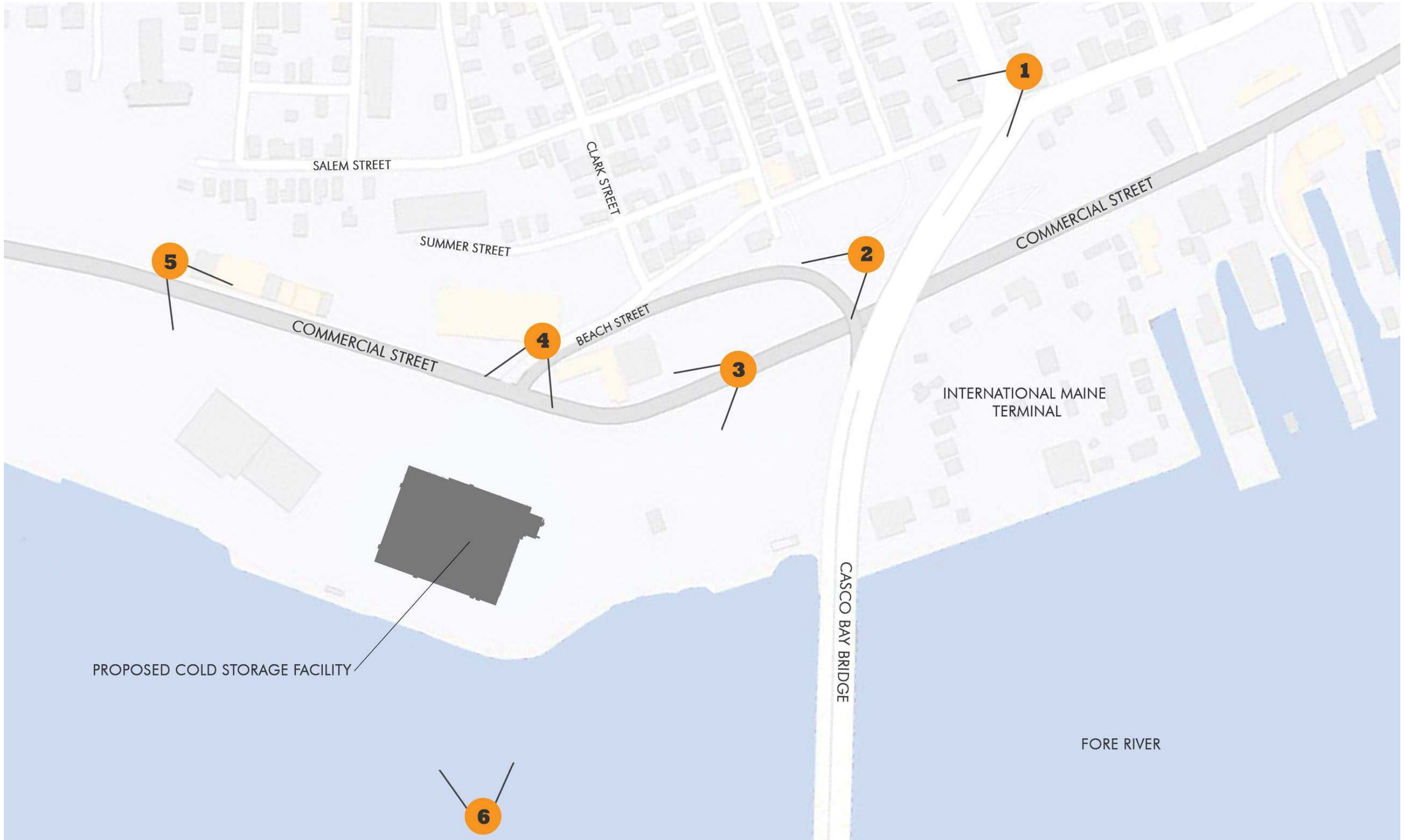
PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

BUILDING VIEW LOCATION MAP



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PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

BUILDING VIEW 1: AERIAL VIEW - LOOKING SOUTHWEST



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PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

BUILDING VIEW 2: VIEW FROM HARBOR VIEW MEMORIAL PARK



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BUILDING VIEW 3: VIEW FROM COMMERCIAL STREET - LOOKING SOUTHWEST



BUILDING VIEW 4: VIEW FROM BEACH STREET (AT COMMERCIAL STREET)

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BUILDING VIEW 5: VIEW FROM COMMERCIAL STREET - LOOKING EAST



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BUILDING VIEW 6: VIEW FROM SOUTH PORTLAND - THOMAS KNIGHT PARK



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PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

NORTHEAST PERSPECTIVE



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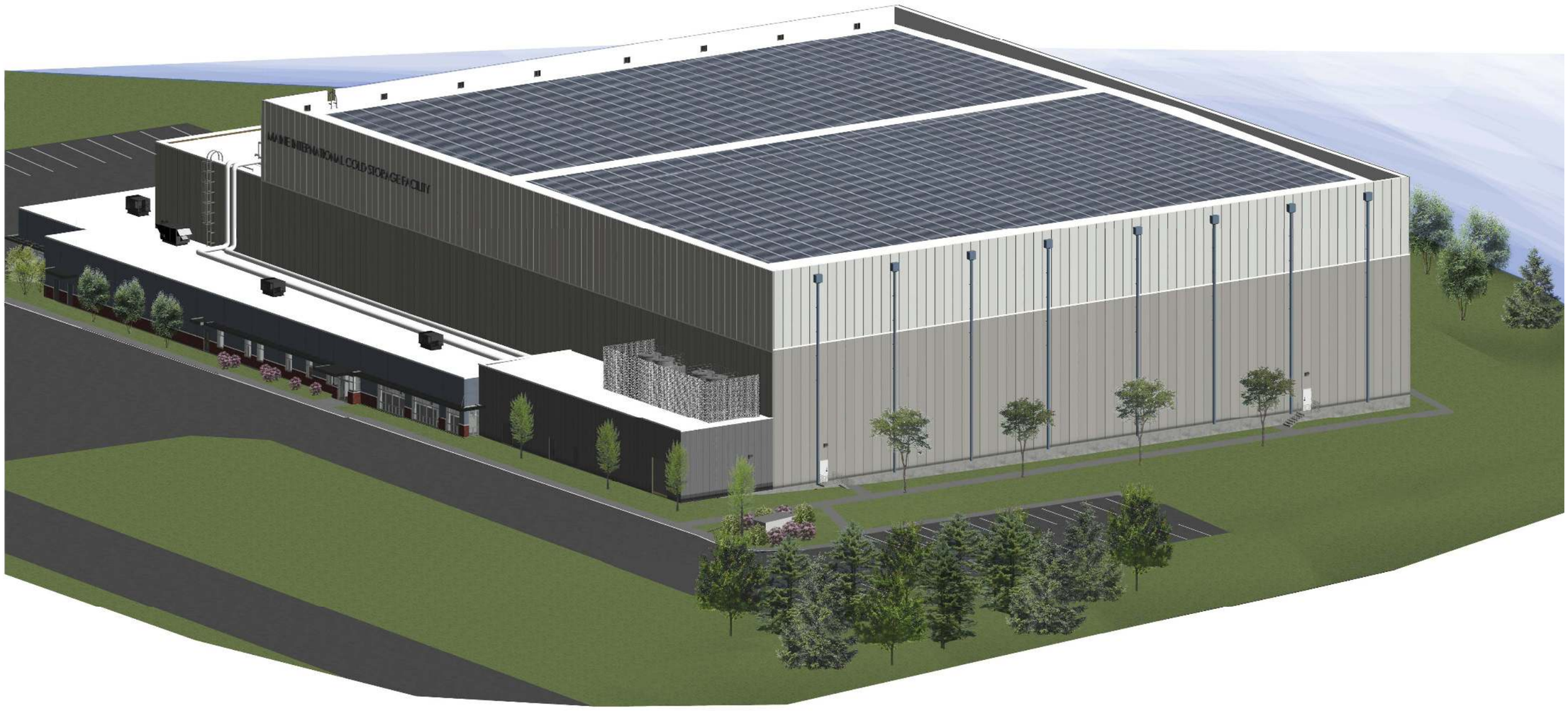
NORTHWEST PERSPECTIVE



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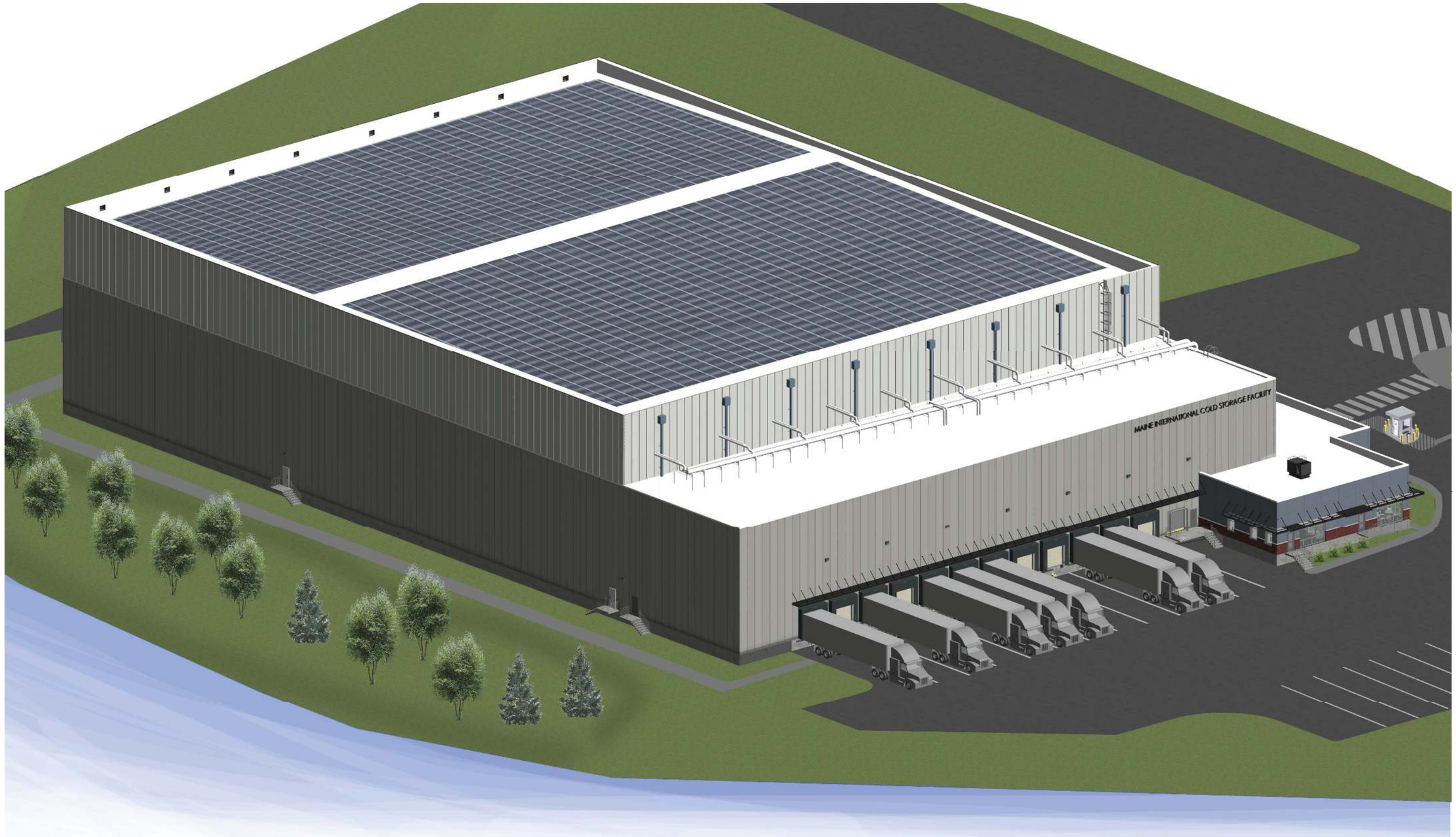
PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

SOUTHEAST PERSPECTIVE



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PROPOSED MAINE INTERNATIONAL COLD STORAGE FACILITY

SOUTHWEST PERSPECTIVE

