

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 Portland Planning Board will hold a remote meeting on Tuesday, May 12, 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.

ZOOM MEETING INSTRUCTIONS

You are invited to a Zoom webinar.

When: May 12, 2020 04:30 PM Eastern Time (US and Canada)

Topic: Planning Board Afternoon Public Hearing 5/12/2020

Please click the link to join the webinar: <https://us02web.zoom.us/j/84504948898>

Or iPhone one-tap :

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Webinar ID: 845 0494 8898

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<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

AFTERNOON PUBLIC HEARING - 4:30 PM

- 1. ROLL CALL AND DECLARATION OF QUORUM**
- 2. COMMUNICATION AND REPORTS**

3. REPORT OF ATTENDANCE AT THE MEETING HELD ON APRIL 28, 2020

Afternoon Public Hearing

100 Andover Road: Chann, Dundon, Dunfey, Mazer, Silk, Smith and Stanley present.

77 Lambert Street: Chann, Dundon, Dunfey, Mazer, Silk, Smith and Stanley present.

4. REPORTS OF DECISIONS AT THE MEETING HELD ON APRIL 28, 2020

- i. Level III Site Plan; 100 Andover Road; MaineHealth dba Maine Behavioral Healthcare, Applicant. Stanley moved and Dundon seconded a motion to approve the site plan. Vote 7-0.
- ii. Level III Site Plan and Subdivision; 77 Lambert Street; 75-81 Lambert, LLC., Applicant. Stanley moved and Dundon seconded a motion to approve the subdivision with three conditions of approval. Vote 7-0. Stanley moved and Dundon seconded a motion to approve the site plan with three conditions of approval. Vote 7-0.

5. NEW BUSINESS

- i. Level III Site Plan; 113 West Commercial Street; FDS JBB Portland, LLC., Applicant. (estimated time 4:30 - 6:30 p.m.) The Planning Board will hold an afternoon public hearing to consider the development of a two story, 62,300 square foot medical clinic and associated site improvements. The subject property is 366,067 square feet and is zoned B-5b.
- ii. Level II Site Plan and Conditional Use; 14 Marginal Way; Central Maine Power Company, Applicant. (estimated 6:30 - 7:15 p.m.) The Planning Board will hold an afternoon public hearing to consider a series of improvements to an existing utility substation including a new 2,944 square foot control house, new transformers and new site lighting. The subject property is 37,303 square feet and is zoned B-7.
- iii. B-3 Downtown Business Zone Text Amendment; Portland Opportunity Fund, LLC., Applicant. (estimated time 7:15 p.m.) The Planning Board will hold an afternoon public hearing to consider a zoning text amendment to modify Section 14-217 of the Land Use Code to permit Congregate Care Facilities and Intermediate Care Facilities for thirteen (13) or more persons within the B-3 Downtown Business Zone.

PLANNING BOARD REPORT

PORTLAND, MAINE



113 West Commercial Street Development

Level III Site Plan Review

JB Brown & Sons, LLC, Applicant

PL-000927-2019 CBL: 060 A001

Submitted to: Portland Planning Board
Public Hearing Date: May 12, 2020

Prepared by: Andrew Tufts, Planner
Date: May 8, 2020

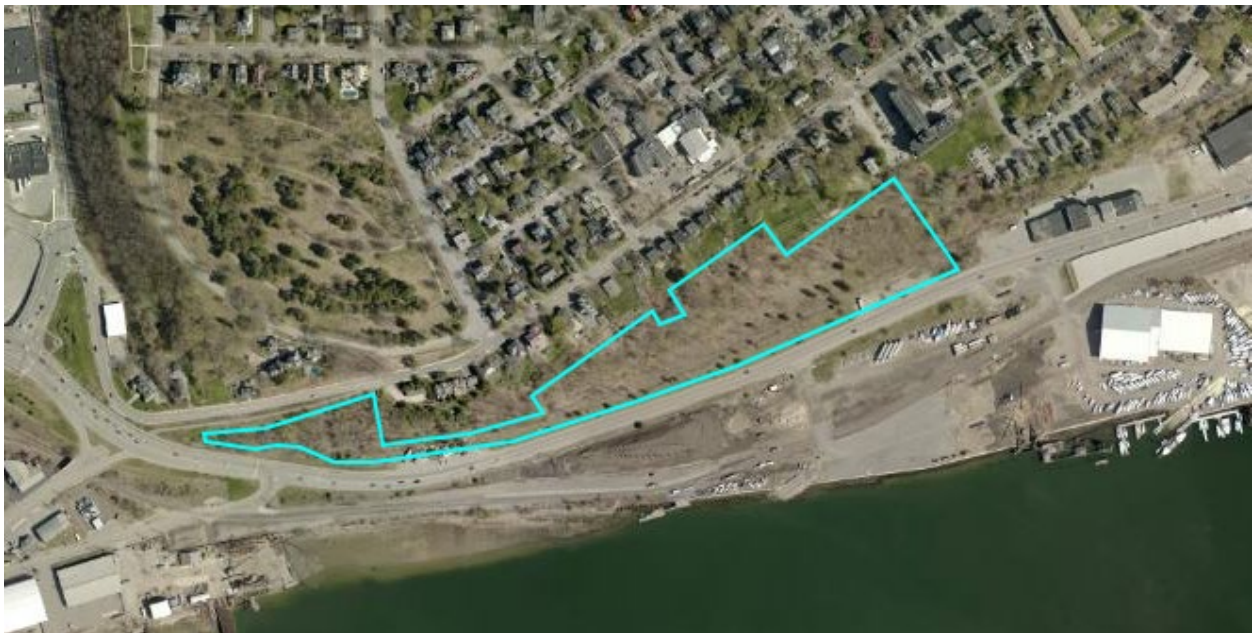


Figure 1: Parcel outline - Source: City of Portland Maine Parcel Viewer

I. INTRODUCTION

JB Brown & Sons, LLC, has submitted a Level III Site Plan application for the development of a Community Based Outpatient Clinic for the Department of Veterans Affairs. The subject property is a 366,067 square foot parcel (8.4 acres) along approximately 1,400 LF of street frontage on West Commercial Street. Approximately 4 acres of the site is zoned B-5b Commercial, where the majority of the site work will occur. The remaining 4 acres, along the rear upland portion of the site, is zoned R-4 Residential. The proposed use is classified as a medical clinic within the Land Use Code, which is a permitted use in the B-5b Commercial Zone.

The Planning & Urban Development Department sent 116 notices advertising this meeting to property owners within 500 feet of the site. A legal advertisement ran in the February 15th & February 16th editions of the Portland Press Herald.

Applicant: JB Brown & Sons, LLC

Consultants: Steve Bushey, P.E. (Gorril-Palmer, LLC (Engineer)) Greg Heppner, AIA (SmithGroup Architects) Nick Elliston (Titcomb Associates (Surveying))

II. REQUIRED REVIEWS

<i>Waiver Requests</i>	<i>Applicable Standards</i>
The applicant is requesting three site driveways along West Commercial Street due to the site conditions including length/street frontage and proposed driveway separation. <u>Staff Comments:</u> DPW does not oppose this waiver.	Technical Standard – Transportation Standards – Number of Driveways 1.7.2.8 No more than two (2) driveways shall be permitted for ingress and egress purposes to any commercial, industrial or residential (with 10 or more parking spaces) site.
The applicant is requesting a waiver of the flooding standards. <u>Staff Comments:</u> Staff is supportive of the waiver. Please see the Site Plan Section C Stormwater & Water Quality.	Technical Standards – Water Quality, Stormwater Management and Erosion Control section of the Environmental Quality Standards (14-526)
<i>Review</i>	<i>Applicable Standards</i>
Site Plan	<i>Section 14-526</i>

III. PROJECT DATA

Existing Zoning	B-5b Commercial, R-4 Residential
Existing Use	<i>Vacant Lands, Surface Parking</i>
Proposed Use	<i>2-story Community Based Outpatient Clinic (CBOC)</i>
Parcel Size	366,067 SF

	<i>Existing</i>	<i>Proposed</i>	<i>Net Change</i>
Building Footprint	NA	34,155 SF	+ 34,155 SF
Building Floor Area	NA	62,170 SF	+ 62,170 SF
Impervious Surface Area	11,240 SF	168,273 SF	+ 157,033 SF
Parking Spaces	0	535	+ 535
Bicycle Parking Spaces	0	42	+ 42



Figure 2: Existing conditions - Source: Google Maps

IV. EXISTING CONDITIONS

The development site is located on West Commercial Street along a gateway to Portland's waterfront. The parcel is approximately 8.4 acres in size, and includes topography consisting of ground elevations ranging from elevation 20 feet to elevation 25 feet from the ROW area back approximately 160 feet. The rear portion of the site is a steep incline ending at approximately 100 feet in elevation. The existing condition is primarily open space with intermittent vegetation in the lower portion adjacent to the street, and denser vegetation along the northern rear of the site. The site is bordered by the Star Match building to the east, a residential area uphill to the north, and directly opposite the Canal Landing Boat repair and maintenance facility that occupies approximately 17 acres on the south side of West Commercial Street. The nearest open space is Harbor View Memorial Park, an approximately 7-minute walk northeast, and the Western Promenade, an approximately 15-minute walk northwest. No sidewalks currently exist on the site. The site is sparsely vegetated along West Commercial Street, with few street trees due to overhead wires and large utility infrastructure below grade.

Drainage in West Commercial Street is limited to a few catch basins that are tied to the City combined sewer overflow (CSO) system. These are located to the west end of the site, thus the ability to convey stormwater off the site will require careful consideration. The segment of West Commercial Street spanning the proposed development's frontage has been subject to flooding in recent years. A recent storm in December of 2019 brought heavy amounts of rainfall resulting in approximately 12 inches of standing water in front of the site. The City of Portland Department of Public Works is currently designing and implementing a plan that addresses these issues.

Owen Haskell, Inc. completed a boundary and topographic survey of the site in June of 2019. An easement exists for an undeveloped portion of Emery Street, which was accepted as a city street in 1851.



Figure 3: Conceptual rendering – West Commercial Street looking north - Source: SmithGroup

V. PROPOSED DEVELOPMENT

The proposed development includes a two-story, 34,155 square-foot Community-Based Outpatient Clinic (CBOC), as well as a three-level 35,800 square-foot parking garage. Three driveways are proposed along West Commercial Street. The main entrance is proposed between the two buildings, with the entrance made prominent by elevated architectural masses on corresponding corners of the CBOC and parking garage. A seating area and gathering plaza is adjacent to the CBOC entrance, allowing patients an area to sit outside in view of the meadow planting.

The parking garage would include 382 parking stalls. The first two levels would be reserved for patients, while the top would be designated for public use associated with the working waterfront and/or the adjacent Star Match property. Vehicles would enter the garage directly to the east of the entrance drive, and can exit either at the entrance or at the eastern side leading to West Commercial Street.

The western driveway provides access to a staff surface parking lot, which contains 152 spaces with its own entrance from West Commercial Street. A staff building entrance is adjacent to the staff parking lot. Service vehicles enter at the east end of the site (behind the garage) and are restricted to the drive lane behind the garage and CBOC. The ambulance dock, mobile imaging station, dumpsters and loading dock are located behind the Clinic, out of site from patients and visitors.

Emery Street, a paper street accepted by the City in 1851, runs North-South along the eastern edge of the project site where the eastern most driveway is proposed. JB Brown has submitted a land transfer agreement to be reviewed by City staff before being sent to the City Council for approval. A land easement is also included so that the City would maintain utility access as well as a right of way.

A second land easement is proposed on the adjacent parcel to the west, owned by JB Brown & Sons, enabling the construction and completion of the shared-use path. Sewer infrastructure within the City ROW prevents the path from continuing along the edge of West Commercial Street. This easement would allow for the path to meander inland and gradually route back along the roadside.

Impact Fees: The transportation impact fee will be applied to this project through the impact fee program's formal modification process by the Planning Board. Specifically, the impact fee will be credited toward the completion of two projects:

1. 10' gravel shoulder along the southern edge of West Commercial Street, to be used for overflow truck parking and staging. This adds trucks staging capacity, which the city needs largely because of growth to the east; and
2. The completion of the shared-use pathway from the western edge of the VA parcel, to the Fore River Parkway. The West Commercial Street Path is an impact fee-eligible project, meaning it's on the list of capital improvements to be made with IF money, a direct substitution.

The Impact Fee ordinance states:

(a) A required impact fee may be modified, in whole or in part, by formal vote of the Planning Board in cases when an applicant is otherwise before the Planning Board, or by the Planning Authority in all other cases, if the reviewing authority finds that:

- 1. The developer or property owner who would otherwise be responsible for the payment of the impact fee voluntarily agrees to make infrastructure improvements for which the impact fee would be collected or an equivalent improvement approved by the reviewing authority; or*
- 2. The developer or property owner is required, as part of a development approval by the City or a state or federal agency, to make or to pay for infrastructure improvements for which the impact fee would be collected or an equivalent improvement.*

Credit amounts shall be determined based on plans, details, and cost estimates for the proposed infrastructure improvements for which the credit is requested. Such plans, details, and cost estimates shall be prepared by a licensed professional engineer and submitted at the time of site plan, subdivision, or building permit application. The applicant shall pay for any third-party review of plans, details, or cost estimates. On-site or immediately adjacent improvements providing direct service to a site as required under subdivision or site plan regulations shall not be considered eligible under this section.

VI. PUBLIC COMMENT AND NEIGHBORHOOD MEETING

A neighborhood meeting was held on the evening of February 13, 2020 at 321 Commercial Street, Portland, Maine at 5:30PM for the proposed project. Approximately 12-14 members of the public attended. Attending on behalf of the development team were Vin Veroneau and Bob Vallee from JB Brown & Sons (applicant), and Steve Bushey from Gorrill Palmer Engineers (civil engineer). Vin Veroneau provided an overview of the project using a PowerPoint presentation, while Steve Bushey was in attendance available to answer questions regarding site design and traffic. There were a number of questions from the public regarding lighting and potential light-trespass from the garage. One member of the public suggested the idea of incorporating potted plantings and landscape features to the top deck of the garage. A representative of Portland Trails was in attendance and there was some discussion of incorporating a pedestrian trail along the Emery Street paper street easement, connecting the uphill neighborhood to West Commercial Street. The meeting adjourned at roughly 6:45PM.

VII. RIGHT, TITLE, & INTEREST AND FINANCIAL & TECHNICAL CAPACITY

The owner of the property is JB Brown & Sons, LLC. The applicant provided a copy of the warranty deed, recorded at the Cumberland County Registry of Deeds in CCRD Book 29147 page 254, which demonstrates their right, title and interest in the property.

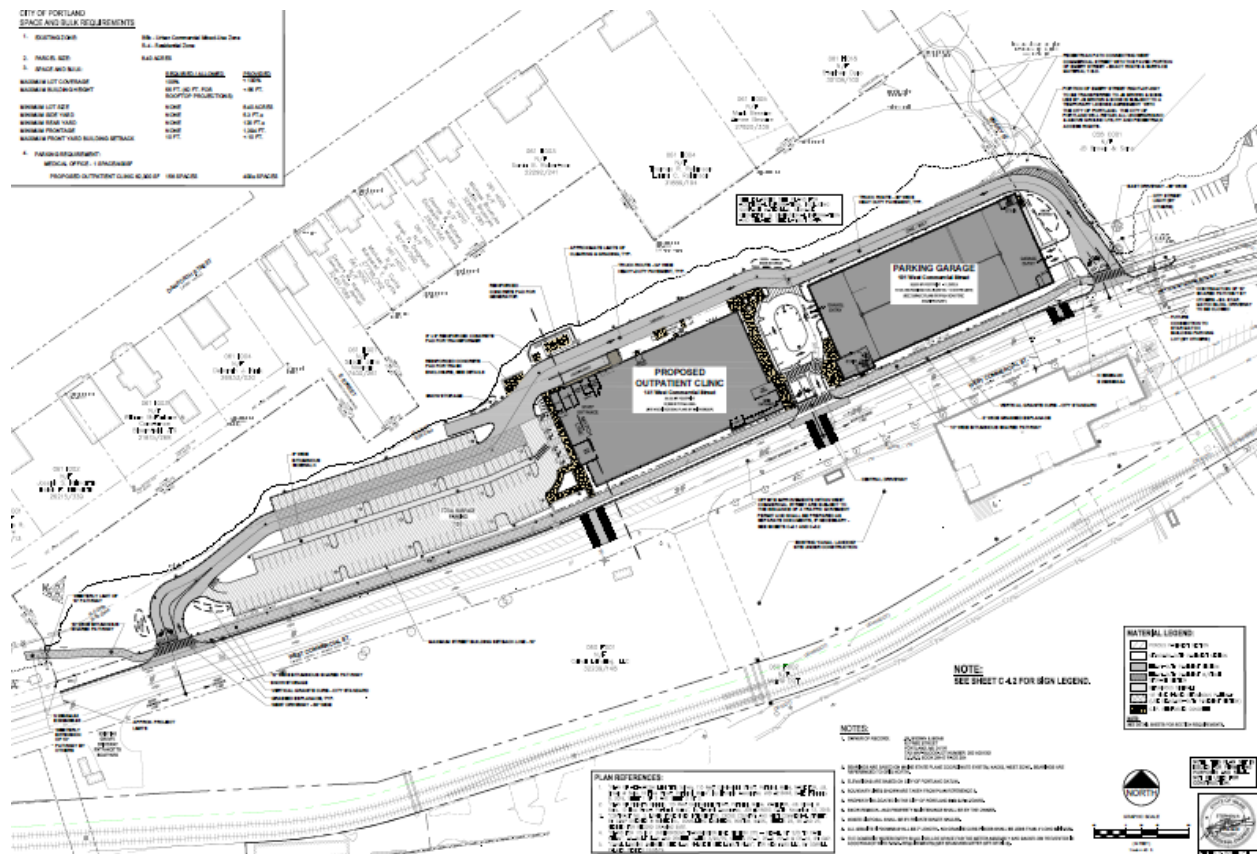
FDS JBB Portland LLC currently is entered into a Lease Agreement with the federal government for a 20-year period.

The applicant team cited their experience and qualifications to demonstrate capacity to design and construct the project.

VIII. ZONING ANALYSIS

Dimensional requirements for this project are dictated by the B-2b community business zone.

Zoning Requirements	B-5b	Provided	+/-
Minimum Lot Size	None	8.4 AC	--
Minimum Street Frontage	None	1,400 ft	--
Front Yard	Minimum: 0 ft Maximum: 10 ft	Max.: < 10ft	--
Minimum Side Yard	None	NA	--
Minimum Rear Yard	10 ft	8.9 ft	--
Maximum Lot Coverage	100%	<60%	--
Maximum Structure Height	55 ft	42 ft	--
Parking	155	540 382 spaces - patients 152 spaces - staff	+ 385
Bicycle Parking	42 spaces	42 spaces	--



IX. DEVELOPMENT REVIEW

A. SITE PLAN SUBMISSION REQUIREMENTS (Section 14-527)

The applicant has submitted a recording plat. The final plat will need to be revised to reflect any waivers and conditions of approval that relate to the subdivision plan. Any waivers granted must be recorded at the Registry of Deeds within two years of a Planning Board decision.

B. SITE PLAN STANDARDS (Section 14-526)

The proposed development has been reviewed by staff for conformance with the relevant review standards of Portland's site plan ordinance and applicable regulations. Staff comments are listed below.

1. Transportation Standards

a. Impact on Surrounding Street Systems and Access and Circulation

The site is located on West Commercial Street along a corridor that spans between the Veterans Memorial Bridge and the Casco Bay Bridge. West Commercial Street currently supports a significant amount of traffic. Vehicles would access the site and parking areas from three driveways creating three new curb cuts along West Commercial. One existing curb cut on the adjacent Star Match property would be closed, resulting in a net increase of two curb cuts. The main public access to the site would be through the middle driveway which is made prominent by elevated architectural masses on corresponding corners of

the CBOC and garage. A canopy is proposed at the CBOC's entrance with space for three cars to drop-off and pickup.

The entrance to the proposed garage is to the east of the main entrance. The garage has two vehicular exits, one at the main entrance drive for pick-ups, and another at its east end leading to West Commercial Street. Staff parking is located west of the clinic and has its own entrance from West Commercial Street.

The proposed project requires the applicant to receive approval for a Traffic Movement Permit (TMP). A TMP application was filed with the City on December 3, 2019 followed by a project scoping meeting conducted on Monday, December 30, 2019. The City's Traffic Consultant, at that time, identified a full traffic impact study would be required in support of the permit application. A traffic impact study was been submitted and reviewed by the City's traffic engineering consultant. The study was approved with the following comments and conditions:

1. *I have reviewed the existing Design Hour traffic volume network during the AM and PM peak hours, and I find the volumes to be reasonable and acceptable.*

Status: *I have no further comment.*

2. *In general, I find the Site Traffic Assignment estimates to be reasonable. I would like you to be prepared to speak to the "Other Garage Spaces" trips and explain those numbers. I would note that it is a small volume and it doesn't have a big impact on the conclusions of the study.*

Status: *The applicant has defined the trips generated by Others and I have no further comment.*

3. *Each individual Other Development trip assignment estimate that led to Figure 3 shall be provided. This does not need to be formal graphics, just supporting documentation.*

Status: *The requested information has been provided and I have no further comment.*

4. *I generally find the trip assignment routing to be acceptable. I would like to understand the assumptions used in assigning traffic to the project driveways.*

Status: *Documentation on traffic assignment has been provided and I have no further comment.*

5. *I generally concur with your safety assessment and mitigation suggestions. I need to coordinate with City staff on recommended strategies for implementation.*

Status: *In conjunction with MaineDOT Traffic Movement Permit Rules and Regulations the applicant shall implement the following safety improvements. The applicant shall provide design plans and specifications for these improvements for review and approval prior to implementation:*

West Commercial Street at Beach Street

1. *Provide No Right Turn on Red blank-out sign for the Beach Street approach.*
2. *Provide Red Signal Ahead advance traffic light warning sign on the outside of the curve for westbound Commercial Street traffic.*
3. *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.*

West Commercial Street at Valley Street

1. *Provide ground-in skip lines for the dual left turn movements and right turn movements, using either traffic tape, thermoplastic, polyurea, or methyl methacrylate (MMA) marking material.*
 2. *Provide white lane use and symbol markings on all lanes at the intersection, as well as providing lane use and symbol markings for the Valley Street approach back to the intersection with St. John Street.*
6. *I generally find the SimTraffic analysis and conclusions to be reasonable. Please provide the Synchro networks for review. The model documents problems at West Commercial Street at Beach Street, Valley Street and Fore River Parkway. Mitigation options for these locations are limited. For this project it is very important that an improvement plan be developed for West Commercial Street at the project site and how the plan transitions and interfaces with other properties (driveways). As you know the project requires a waiver from City standards for the number of driveways and the improvement plan will assist in supporting the waiver (for example how it works with the shared Star Match Building driveway, the Beach Street left-turn lane, etc.). I would note the SimTraffic analysis estimates significant queuing at the employee driveway during the AM peak hour. When I get the model, I will review what is going on at this location.*

Status: The applicant has provided the Synchro traffic models and I find the modeling results to be reasonable. The following should be noted:

- *The model indicates the main driveway and easterly driveway will operate at an acceptable level of service during peak hours. The westerly employee driveway will experience some delays and queuing entering the site during the AM peak hour. The applicant is recommending an improvement plan for West Commercial Street that will balance the left-turn storage length into the employee driveway with the Lane Drop Merge east of Cassidy Point Drive. In my professional opinion the recommended concept plan will provide acceptable conditions for access/egress movements at the site.*
- *The model indicates long delays and poor levels of service at the West Commercial Street/Beach Street intersection. The majority of site traffic is anticipated to originate or destined to the west and thus this project is not anticipated to have a significant impact at the subject intersection. No specific mitigation is recommended at this location given constraints. As noted above, safety improvements are recommended.*
- *The model did not include the traffic operations for pick-up/drop-off activity at the main driveway. It will be extremely important from a safety and mobility perspective*

that vehicle queues do not spill back into West Commercial Street. Refer to recommendations from Mike Tremblay regarding the requirement that the applicant conduct a monitoring study and implemented improvements if warranted.

b. Sidewalks

West Commercial Street does not currently have a sidewalk along the site frontage. The project includes the development of a 10-foot-wide multi-use pathway along the site frontage, to be developed in accordance with the West Commercial Street Multi-Modal Corridor Study. The pathway will be paved asphalt and will involve granite curb placement, an esplanade and the pathway. Linkage to the proposed VA Clinic development will be provided at several locations.

The current design shows the path ending at the edge of a city stormwater overflow basin. The applicant has expressed support for an easement that will allow the city to reroute the path around this obstruction, to be finalized in the course of the site plan review.

c. Public Transit Access

West Commercial Street does not currently fall within a METRO service route; therefore, service is not directly available at the site. METRO is currently undertaking an update to their systems and routes and service may be considered along West Commercial Street.

The implementation of the West Commercial Street multi-modal pathway into the site planning meets the objectives of previous City studies and planning.

d. Parking

The proposed project would provide 540 parking spaces on site. The development would include 152 surface parking spaces and 382 spaces within the parking garage. The City Code requires 155 spaces based on a ratio of 1 space/400 sf for a program of 62,300 sf. The proposed parking exceeds the required parking by greater than 10%.

The tenant agreement with the VA requires that 400 spaces be provided for their programming. An additional 132 spaces will be provided in the parking garage and these will be available for use by tenants of the Star Match building.

A Transportation Demand Management (TDM) Plan is required under site plan standards. The programming for internal VA traffic monitoring has not yet been determined, but the VA does employ a rideshare program. The applicant is requesting that the submission of a TDM plan be made a condition of approval tied to the issuance of a certificate of occupancy. This will allow the developer and government representatives an opportunity to coordinate the program for the site. Staff recommends that if submission of a TDM is made a condition of approval, that the applicant submit an overview of what the anticipated approaches to transportation demand management will be, prior to a full plan being submitted.

Parking aisles and dimensions on the proposed parking areas meet the applicable standards. This will include 9' x 18' stalls and 24' min. two-way drive aisles and 16' wide one-way drives.

All new surface parking shall be paved. Porous pavement is proposed for much of the surface parking field, allowing for greater stormwater infiltration onsite.

e. Bicycle Parking

The applicant is proposing 42 bicycle spaces, meeting the required 42 spaces.

2. Environmental Quality Standards

a. Preservation of Significant Natural Features

There are no known significant natural features on the site.

b. Landscaping and Landscape Preservation

A landscaping plan was submitted as part of the application. The proposed parking lots will contain landscaping that is consistent with the City's technical standards.

The site landscaping plan contains tree plantings along the front of the property, within the site and not within the Public right of way. The plans include the development of a 5' wide esplanade and the 10' wide pathway within the right of way. Unfortunately, the esplanade is generally located over the existing 115 KVA high voltage underground power transmission line and also below the overhead lines, thus the placement of trees in this zone is prohibited. To offset these restrictions, the plan includes additional tree plantings on the site.

Jeff Tarling, City Arborist, submitted the following comments to the applicant:

Due to the wide multi-use trail and overhead utility lines the typical regular street-tree spacing 45' on center that we like to see on a connector road like West Commercial Street seems improbable.

The best treatment for the narrow space between the roadway and walkway appears to be turf due to heavy snow load in the winter and overall appearance. We would recommend using the "Yardscaping / Bayscaping Seed Mix" developed by the State of Maine and available locally at Allen Sterling & Lothrop for all mowed lawn areas. This seed mix should perform well given the conditions and proximity to Casco Bay will require less fertilizer and should hold up to stress.

The space between the path and the building frontage could benefit from a mix of woody shrubs, herbaceous plant material, ornamental grasses given the fact that no street trees are proposed. This space could include regular lawn in places as well but we suggest due to the long expansive frontage having some landscape texture and treatment would be helpful.

Parking lot trees & landscape - All parking lots should meet the required landscape treatment which the plan seems to address along with the flexibility of using some of the smaller sized plant material specified for the fringe areas.

Invasive Plant control - the large space outside the project construction site contains an extensive amount of invasive plants, mostly Japanese Knotweed, Bittersweet. This space should be managed to control / contain invasive plants from further spreading. This could be done prior to or at the same time as the site work using mechanical removal (brush mowing) and chemical control as recommended. The site has been vacant for decades and it is typical of such sites to contain the mentioned species. We are meeting with Nancy Olmsted from the Maine Natural Areas program who oversees Invasive Plant projects in Maine for recommendations.

Open Space - The aforementioned open space between the project and the Danforth Street residential properties might be an opportunity for a land trust like Portland Trails to partner on trail and land management knowing that good access helps prevent unwanted activities and could help manage the space. This note is suggestive as a possible outcome to manage the vacant / open space portion of the site.

These comments were received and accepted by the applicant, meeting landscape standards.

c. Water Quality, Storm Water Management and Erosion Control

The proposed project was reviewed by a third-party civil engineer, who found it to be in compliance with relevant standards (**Attachment 3**).

The existing site contains approximately 11,240 square feet of impervious surface. Redevelopment of the project site would result in an increase of approximately 157,0133 square feet of impervious area, to a total of 168,273 square feet.

Currently, this stretch of West Commercial Street is prone to flooding when there is a combination of high tides, snow melt, and storm events. The applicant is working with DPW to address and improve these conditions.

The applicant has outlined the existing conditions of stormwater infrastructure along West Commercial Street:

The exact conveyance route of the existing street system is unknown and the development team is coordinating with DPW on these existing conditions. The existing 48" Fore River interceptor sewer is located along the site frontage. An existing overflow control structure is located just west of the site and that structure contains a 24" overflow pipe to the Fore River. Similarly, there is a control structure along the Interceptor opposite the Emery Street right of way and that CSO structure regulates flows to multiple overflow pipes out to the Fore River. Each of these CSO systems remains active. The site is proximate to the Fore River tidal conditions and only the Canal Landing Boat Yard is between the site and the river.

The site's stormwater runoff will be collected by several means. The proposed clinic building roof will contain drains that will tie into a subsurface chamber storage system and below grade treatment device. These systems will provide both water quality treatment

and flood control. Additionally, the surface parking will use porous pavement with catchment areas beneath.

The project is required to comply with stormwater management regulations in accordance with Maine DEP Chapter 500 and City of Portland Technical Manual Chapter 5 stormwater regulations. The project will also be required to meet the standards as required for a Site Location of Development permit.

Lauren Swett, Consulting Civil Engineer, has provided the following comments in regard to stormwater and erosion control:

- *Basic Standards: The Applicant is providing erosion and sedimentation controls in conformance with the Basic Standards.*
- *General Standards: The proposed stormwater management system achieves the required developed area treatment standard of 80% by treating 85.59% of the developed area. However, the overall treatment percentage for impervious areas fall below the 95% treatment standard, treating 93.16% of the new impervious area. The applicant proposes to increase the runoff treatment depth from the porous pavement section and employ a catch basin filter cartridge in the loading dock truck well in order to supplement the impervious area that cannot be treatment due to grade restrictions and existing utilities within the ROW. We are in agreement with this approach to providing treatment.*
- *Flooding Standards: The Applicant has requested a waiver from the flooding standard. Ultimately, this drainage discharges to the Fore River, and a waiver of the flooding standard to a major body of water like that is acceptable from a natural resources standpoint. The intermediate infrastructure capacity will not be a concern, as the infrastructure project planned for the area will account for the modeled drainage. Brad and Justin noted that the reason why the infrastructure project is happening, and why there has been flooding here already is because some existing pipes have been crushed, likely due to snow storage load. A waiver of the standard is acceptable here.*

3. Public Infrastructure and Community Safety Standards

a. Public Safety and Fire Prevention

The site would provide access from three driveways for emergency vehicles. Fire hydrants would be located along West Commercial Street and would be within 25' of the front corner of the garage. The clinic would be fully sprinklered and the parking garage would contain standpipes for Fire Department use.

The Fire Prevention and Community Outreach Division has reviewed the submitted plans and found them to be acceptable, noting the following points:

- *The site plan needs to be submitted to the City of Portland Public Works Engineering so the E-911 Addressing Officer can assign an official street address to the project.*
- *The address of the parking garage shall be 101 W. Commercial Street*
- *The address of the office building shall be 141 W. Commercial Street*
- *The street address of each building shall be clearly marked on the front of the building, as approved by the fire department.*
- *Elevators shall be a minimum of 84"x24"*
- *Any canopy or archway shall provide a minimum clearance of 13'6".*

b. Availability and Adequate Capacity of Public Utilities

The applicant received confirmation of ability to serve from the Portland Water District and confirmation of adequate wastewater capacity from the Department of Public Works (attachment L).

The project will require new electrical, gas, sewer, and water services to the clinic and power and sewer to the garage. An ability to serve letter has been requested from the Portland Water District, and a Wastewater Capacity Application has been approved by Brad Roland, P.E., Senior Project Engineer, at the City of Portland.

All new electrical services to the site will be underground. All new utility infrastructure will meet the provisions of the Technical Manual. The Clinic will be served by new fire and domestic mains off the PWD 16" water main located in West Commercial Street. The building sewer will connect to the existing Fore River Interceptor sewer located along the front property line. Power will be from the existing overhead primary distribution system that CMP maintains on West Commercial Street.

4. Site Design Standards

a. Snow and Ice Loading

The buildings have been designed and located such that accumulated snow and ice will not fall onto adjacent properties or public ways. Snow will be removed from the parking lots and stockpiled within the site perimeter or if necessary, removed from the site.

b. View Corridors

The site is not located within any corridors identified in the Downtown Vision View Corridor Protection Plan.

c. Historic Resources

The development is not located within a designated historic district.

d. Exterior Lighting

All new exterior lighting at the site will be full cutoff with no light emitted above the horizontal plane, and in accordance with Section 12 of the Technical Manual. A photometric Lighting Plan has been prepared by Swaney Lighting Consultants to demonstrate illumination levels throughout the site will be consistent with City Standards.

The Planning Department's Urban Designer worked with staff to review the plans, and a design review memo can be found in the attachments.

e. Noise and Vibration

All heating, ventilation, air conditioning equipment including air handlers and generators are designed to meet local, state, and federal emissions and noise requirements. Most of the HVAC equipment is mounted in the middle of the roofs to minimize visibility. Any additional ground mounted equipment for the buildings will be screened.

f. Signage and Wayfinding

All signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code. The proposed hotel and commercial signage can be seen on the architectural renderings.

g. Zoning Related Design Standards

A design review was submitted by the City's Urban Designer as part of this report. It found the proposal to be in conformance with design standards.

h. Construction Management Plan

The construction management plan was reviewed and accepted by City staff. The applicant will need to work with city staff to ensure proper measures are taken in earthwork.

X. SITE LOCATION OF DEVELOPMENT REVIEW

The City of Portland has delegated review authority from the Maine Department of Environmental Protection for large projects that trigger Site Location of Development Act (SLODA) review. The standards for this review generally dovetail with Portland's existing site plan and subdivision standards:

- Financial & Technical Capacity: see section VII, above.
- Traffic Movement: see site plan standards, a, above.
- No Adverse Effect on the Natural Environment: see site plan standards, b, above.
- Soil Types: see site plan standards, b, above.
- Ground Water: see site plan standards, 2, above.
- Infrastructure: see site plan 2, 3, and 4, above.
- Flooding: see site plan, 2, above.
- Storm Water Management & Erosion and Sedimentation Control: see site plan 2, above.

XI. STAFF RECOMMENDATION

Subject to the proposed motions and conditions of approval listed below, Planning Division staff recommend that the Planning Board find the 113 West Commercial Street development project meets the applicable standards of Portland's Land Use Code.

XII. PROPOSED MOTIONS FOR THE BOARD TO CONSIDER**A. SITE PLAN REVIEW**

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 May 12, 2020, for application #PL-000927-2019, 113 West Commercial Street relevant to the site plan regulations; and the testimony presented at the Planning Board hearing, the Planning Board [finds/does not find] that the plan is in conformance with the site plan standards of the Land Use Code, subject to the following conditions of approval:

PRIOR TO ISSUANCE OF A BUILDING PERMIT

1. The Applicant shall provide updated site plan drawings for the final design of the section of the shared use path to be constructed by the Applicant for the review of the Planning Authority. This alignment shall include approved driveway crossings, an acceptable functional pathway width dimensioned with the shy distance from the retaining wall and other fixed objects, and acceptable locations for utility poles and lighting.
2. The Applicant shall receive a positive sewer capacity letter from the City's Water Resources division.
3. The Applicant shall coordinate with the City regarding finalization of a license agreement for use of a 60-foot-wide portion of Emery Street, as shown on the final Site Layout Plan.
4. The Applicant shall enter into an agreement with the City to maintain a public access and utility easement to provide for a future trail connection and maintenance access to the City's public utilities within and adjacent to the current Emery Street ROW.
5. The Applicant shall provide the following plans for review and approval by the City's Water Resources division: 1) Plans for protecting the proposed sewer main within the Emery Street ROW from the proposed retaining wall in the vicinity of the sewer lateral; 2) Plans for provision of a storm drain within the current Emery Street ROW.
6. The Applicant shall provide plans for slope stabilization at the site, stamped by a structural engineer, for review and approval by the Planning Authority.
7. The Applicant shall provide updated Site Plans reflecting the finalization of the alternative merge alignment and associated infrastructure of West Commercial Street.

PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY

7. The Applicant shall have a City-approved monitoring and reporting plan for their central driveway for at least one year after occupancy, and as needed thereafter.
8. A final Transportation Demand Management Plan shall be submitted to the Planning Authority for review and approval.
9. The Applicant shall provide evidence of an easement related to the construction of the public shared-use path between the VA parcel and the Fore River Parkway for review and approval by the Planning Authority, the Department of Public Works, and Corporation Counsel. 7. In the event the Applicant assumes ownership of a portion of the Emery Street right of way, the applicant shall provide evidence of a utility easement for review and approval by the Planning Authority, the Department of Public Works, and Corporation Counsel.

B. IMPACT FEES:

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 May 12, 2020, for application #PL-000927-2019, 113 West Commercial Street relevant to the site plan regulations; and the testimony presented at the Planning Board hearing, the Planning Board [finds/does not find] that the plan is in conformance with the site plan standards of the Land Use Code, subject to the following conditions of approval:

1. Construction of a 10' gravel shoulder along the southern edge of West Commercial Street, to be used for overflow truck parking and staging, which adds truck staging capacity; and
2. The completion of the shared-use pathway from the western edge of the VA parcel to the eastern limit of the Fore River Parkway path. The West Commercial Street Path is an impact fee-eligible project.

The modification shall be granted under the following conditions:

1. Prior to issuance of a Building Permit, the applicant shall use a portion of their impact fee credit on the plans, details, and cost estimates to be prepared by a licensed professional engineer for the construction of a 10' gravel shoulder along the southern edge of West Commercial Street, to be used for overflow truck parking.
2. Prior to issuance of Certificate of Occupancy, the applicant shall use a portion of their impact fee credit on the plans, details, and cost estimates to be prepared by a licensed professional engineer and approved by the Planning Authority and the Department of Public Works for the construction of the shared-use path extension, spanning from the western terminus of the VA parcel to the existing terminus of the shared use path at the Fore River Parkway.
3. Within 18 months of receiving the Certificate of Occupancy, the applicant shall construct the extension of the West Commercial Street Trail shared use pathway from the western terminus of the VA parcel to the existing terminus of the shared use path at the Fore River Parkway. The construction bids received shall be reviewed and approved by the Department of Public Works prior to the bid being awarded and construction commenced.

XIII. ATTACHMENTS
PLANNING BOARD REPORT ATTACHMENTS

1. Public Comments
3. Updated Comments

APPLICANT'S SUBMITTALS

A - PROJECT DESCRIPTION
B - RIGHT, TITLE, & INTEREST
C - TECHNICAL CAPABILITY
D - FINANCIAL CAPACITY
E - ZONING ASSESSMENT
F - WAIVER REQUESTS
G - SITE DESIGN
H - NEIGHBORHOOD MEETING
I - LEVEL III CHECKLIST
J - TRANSPORTATION
K - TRAFFIC IMPACT STUDY
L - PUBLIC INFRASTRUCTURE & SAFETY
M - ARCHITECTURAL NARRATIVE
N - ARCHITECTURAL RENDERINGS
O - APPLICATION LETTER
P - CONSTRUCTION MANAGEMENT
Q - COMMENT RESPONSE LETTERS
R - STORMWATER MANAGEMENT REPORT
S - W-1 PRE-WATERSHED PLAN
T - W-2 POST-WATERSHED PLAN
U - ENVIRONMENTAL & LANDSCAPE FEATURES
V - ENVIRONMENTAL & STORMWATER
W - DESIGN REVIEW

PLANS

P1. COVER
P2. GEN NOTES
P3. BOUNDARY SURVEY
P4. EXIST & REMOVALS
P5. SITE PLANS
P6. GRADING
P7. EROSION CONTROL PLANS
P8. FLOOR PLANS
P9. ARCHITECTURAL ELEVATIONS
P10. UTILITIES
P11. STORMWATER PLAN
P12. PHOTOMETRICS PLAN

P13. LANDSCAPE

P14. PROFILES

P15. BUILDING IMAGERY

Development in the vicinity of 113 West Commercial Street

joshua.broder@gmail.com <joshua.broder@gmail.com>

Dec 30, 2019 1:10 PM

Posted in group: **Planning Board**

I'm writing in response to a notice I received of the FDS JBB Portland LLC development slated to become a VA clinic on Commercial Street.

I reside at 414 Danforth St, and will likely be able to see this development from my back yard.

I'm also an owner of a large office condo at 16 Middle Street, where my business Tilson, employs many veterans who will make use of this clinic.

I'm also a veteran who will most likely make use of the clinic.

I think this development is appropriate and should move forward. The peninsula is a great place for this kind of density and Commercial Street to the highway can support the traffic. I also think a larger on peninsula VA clinic supports a vibrant live and work community here in Portland as evidenced by it's utility to me as a resident and my employees who work on peninsula.

Respectfully submitted,

Josh

Re: Proposed VA Center - for Distribution to the Planning Board

constance bloomfield <constancebloomfield1@gmail.com>

Jan 19, 2020 7:07 PM

Posted in group: **Planning and Urban Development**

Thank you for the opportunity to comment on the plans submitted thus far for the W. Commercial St. VA Facility.

COMMENTS ON W. COMMERCIAL ST. VA CLINIC - LEVEL III SITE PLAN REVIEW

SITE PLAN

The Planning Board should require site sections with building outlines at parking lot, clinic building, and parking garage. Such site sections are crucial for understanding this project in its context. Site sections should include the entire slope in order to determine where and to what extent "modest cutting into the slope" will occur. The slope is notoriously unstable; if cutting is absolutely necessary, uphill neighbors need to be assured that the developer assumes liability for its effect on uphill properties for many years in the future.

Site sections, including building outlines, will reveal what effect lighting, particularly on the top level of the parking lot or clinic roof will have on the neighboring residences on Danforth St. 90 degree cut-off lights may shine directly into these houses, depending on the height of the poles and the elevations of residences vis-a-vis the top of the garage.

Site plan should be coordinated with project recommendations from the West Commercial Multi-Modal Corridor: particularly widening of west Commercial St. immediately in front of project site and; construction of a landscaped median from Benny's to the Star Match Buildings. This project should not preclude implementation of the Study's recommendations in the future. For example, there seems to be no room for a curb cut on either side Commercial St. for bus loading and unloading. Nor does there seem to be adequate room for car and bus turn-around between the two buildings.

Developer should be encouraged to retain some fully-grown trees on the site of the staff parking lot and bordering Commercial St. – rather than treat the landscape as a scrape and asphalt project.

PROGRAM

This seems to be a much larger facility than the clinic operation it is replacing. If it is an expanded program and/or with a larger population base, the project description should address that.

The number of parking spaces is more than 2 ½ times the city's requirement for a building of this size and use. In fact the staff parking lot alone would meet the standard. This suggests that the parking structure will be serving a larger constituency and not solely serving the VA. If so, that should be stated at the outset, as it introduces other elements to consider. Is it a 24-hour facility; will there be shuttle buses to downtown; who will manage it? Will it be full of reserved spaces, that sit empty on weekends, etc? Any traffic analysis must deal with the VA use and any additional use anticipated by this large parking structure.

ENVIRONMENTAL CONSIDERATIONS

These buildings are designed for a mid-20th Century world, not a 21-century world with its energy and climate issues. The parking structure is not the only aspect that flaunts the needs of the future.

The building insulation and glazing as described, meets the minimal state requirements, anything less is illegal. No one should be praised for thermal breaks and double-glazing or 3 inches of rigid insulation. In terms of heat loss and gain the building components are significantly less than is easily accomplished in this day and age at no significant increase in construction cost and huge decreases in operating costs. In addition, the building has been designed with apparently no attention to its compass orientation. There is no built-in shading on the south and west facades. In summer the unshaded south-facing glass

entry 'towers' will be unbearably hot and will produce massive cooling loads. There must be other ways to establish a grand and dignified entry. And why is the clinic building's rooftop not covered with solar collectors, or provided with a vegetated surface?

Exterior lighting standards should exceed Dark Skies standards. The number of lights should be limited and the shortest pole heights chosen to assure safety but not excessive lighting or light spread. Cut-offs should be less than 90 degrees for pole lights and building exterior lights. The staff parking lot lighting should be limited to hours of operation. The parking structure is described as having symbolically important back-lit panels – will it glow in all directions all night? That might be re-considered.

**Elizabeth C. Parsons
44 Winter Street
Portland, ME 04102**

21 February 2020

Mr. Andrew Tufts, Planner
City of Portland
389 Congress Street
Portland, ME 04101

RE: 113 West Commercial Street, PL 000927-2019

Dear Andrew:

Since I cannot attend the Planning Board workshop related to this project, I am sending along some observations in the spirit of the conversation I had with you and James Rather a few weeks ago.

As you know, late last year our City Council declared a climate emergency and [resolved](#) to act aggressively in reducing Portland's climate emissions. Meeting this objective will necessarily require significant changes to ways in which we've become accustomed to constructing buildings and using land. To that end, and specifically as relates to the above-mentioned project in the West End, I note the following:

- The envisioned project has been “designed to respond to the challenges of the local climate” and to meet sustainability standards named under the terms of the solicitation process.
 - This seems to involve mostly energy efficiency measures, which are laudable. However:
- The building's rooftop is flat and the whole will be situated in an open area. Why are solar panels not included?
- Heating will apparently be by natural gas. What about heat pumps, the costs of which continue to decrease?
- The large windows will be glazed. What will be done to ensure that birds (the numbers of which have declined precipitously in recent years due largely to human encroachment on wildlife habitat) do not fly into those windows?
- A parking garage and a parking lot will take up considerable space. With Maine's poor public transportation system and this project attracting people statewide, the parking garage makes sense (solar panels could be put there too). But what about local staff who would park in the lot? What arrangements might be made to reduce individual vehicular traffic in exchange for incentives to take public transportation and/or a shuttle?
- A long-planned extension of Portland trails is situated in the roadway in front of the construction project. Mention is also made of emphasizing natural lighting and an open

feeling to the complex that would contribute to towards Veterans' healing. If the staff parking lot were reduced in size or eliminated, much more greenspace would be available. And how about putting the trail behind the property, in the treed area where the old rail line runs?

Given that construction on this project is slated to start soon, I expect that the design planning process is quite far advanced. Nonetheless, this is the very type of project the City should be demanding more from if we are serious about doing our part to reduce carbon emissions. This is the point my colleague on the Portland Climate Action Team, Martica Douglas, was making in her recent *Press Herald* [Maine Voices](#) article.

Portland's establishing stringent emissions-reducing standards for every single bit of construction that goes up should be a major policy focus of the Planning Board and of all related City departments from here on out. That might seem like an unrealistic thing to propose, but we're living in unprecedented ecological times. It would take vision and courage for City leaders to make and enforce this type of policy change. But, to echo President Kennedy's exhortation about putting men on the moon, making such a change is something we need to do not because it's easy but because it's hard.

And who knows? It's possible that Portland's taking a strong, more holistic stance on development might inspire an unexpected swell of investment interest and creative construction design.

Please feel free to share these comments with Planning Board members. I have copied a few other key people as well.

Sincerely,

Elizabeth C. Parsons
Member, Portland Climate Action Team

cc: Councilor Spencer Thibodeau
Councilor Jill Duson
Councilor Belinda Ray
Christine Grimando
James Rather
Martica Douglas

Public Comment-113 West Commercial Street: Emery Street Opportunity Zone - But Opportunity For Whom? [Part 1 of 2]

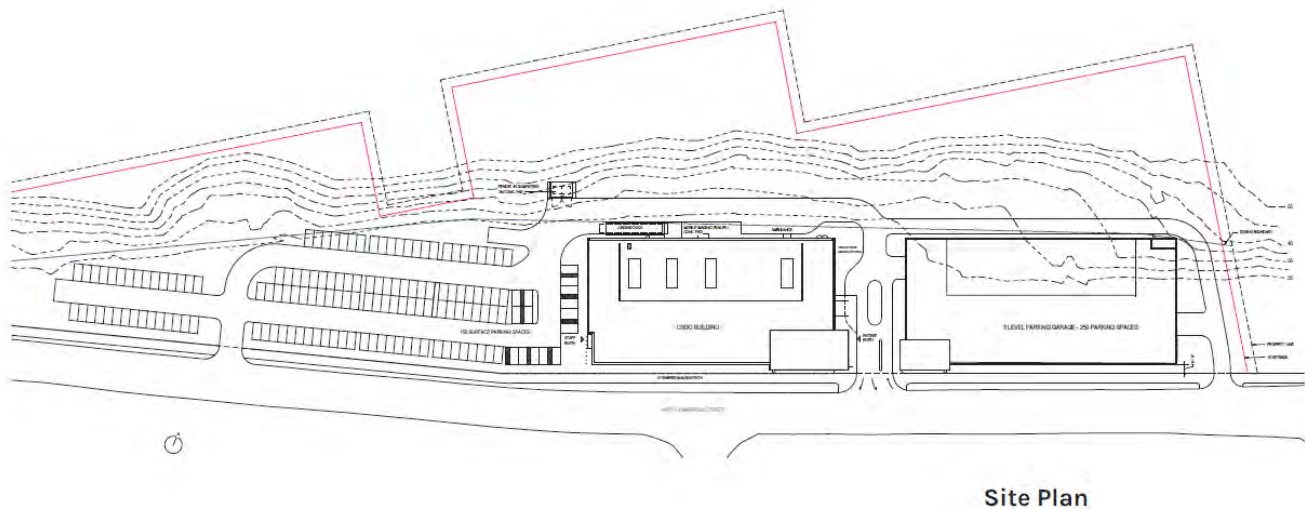
George Rheault <george.rheault@gmail.com>

May 8, 2020 11:54 AM

Posted in group: **Planning Board**

I am opposed to the driveway accommodations being proposed on the public right-of-way by the applicant for the eastern edge of their project site. While the board packet has not yet been published, I assume the use of a portion of the Emery Street publicly-owned corridor is still the plan being presented to the Planning Board by the applicant even though the applicant has no right, title or interest in the Emery Street right-of-way.

The applicant should be required to revert back to the original site plan it proposed in 2018 to the Dept. of Veterans Affairs when it was bidding for the clinic construction award (shown below - also see attached PDF showing excerpt from applicant's 2018 VA bid materials).



As the applicant's representative, Vin Veroneau, described it in 2-25-2020 planning board workshop, the idea is that in return for closing ONE driveway curb-cut to the applicant's "Portland Star Match Factory" property and offering up an UNKNOWN portion of the applicant's Canco Road/Rocky Hill property (in District 5) adjacent to existing city operations, the City of Portland would give away most/maybe all of the public land in the Emery Street corridor between the unimproved terminus of Salem Street and West Commercial Street while Portland Trails gets some kind of easement or permission to build a trail (funding source unknown) which may or may not be ADA-accessible or even bike-friendly.

This corridor has technically been an accepted "street" and public land since at least the 1850s even though the "street" all the way to Commercial was never actually built. The context here in the 1840s was the original final leg of the protected C&O canal route along what was once called "Canal Street" (presumably used as the canal towpath but also maybe wide enough for other non-canal users to reach the waterfront). With the building of Commercial Street to create railroad access to the waterfront, there never appeared to be any reason for a street connection to be made here except a footbridge was maintained over the extensive rail crossing for over 120+ years for workers and managers to reach the rest of the railyards and the other industries at this waterfront zone. Sometime in the late 1960s it disappeared completely (rail traffic had diminished so much it probably was very safe to walk on the lightly used tracks) and was not replaced (perhaps the City also failed to enforce whatever requirement may have once existed for the property owner (the terminal company) to maintain the footbridge). See attached a 1950 Sanborn Company Insurance Map showing the footbridge. Here also is an earlier insurance map (lower half) from the 1880s showing the footbridge. Also shows how busy this part of the industrial waterfront appeared at this time:

https://www.loc.gov/resource/g3734pm.g3734pm_g035271886/?sp=14&r=-0.374,0.362,1.743,0.812,0

(on a completely different topic, the 1880s insurance map also presents a great look at the east end of what is now Deering Oaks park - a great demonstration of how Portland did not have to wait for post-WWII urban renewal to practice radically disturbing its urban landscape when it suited its elites to do so).

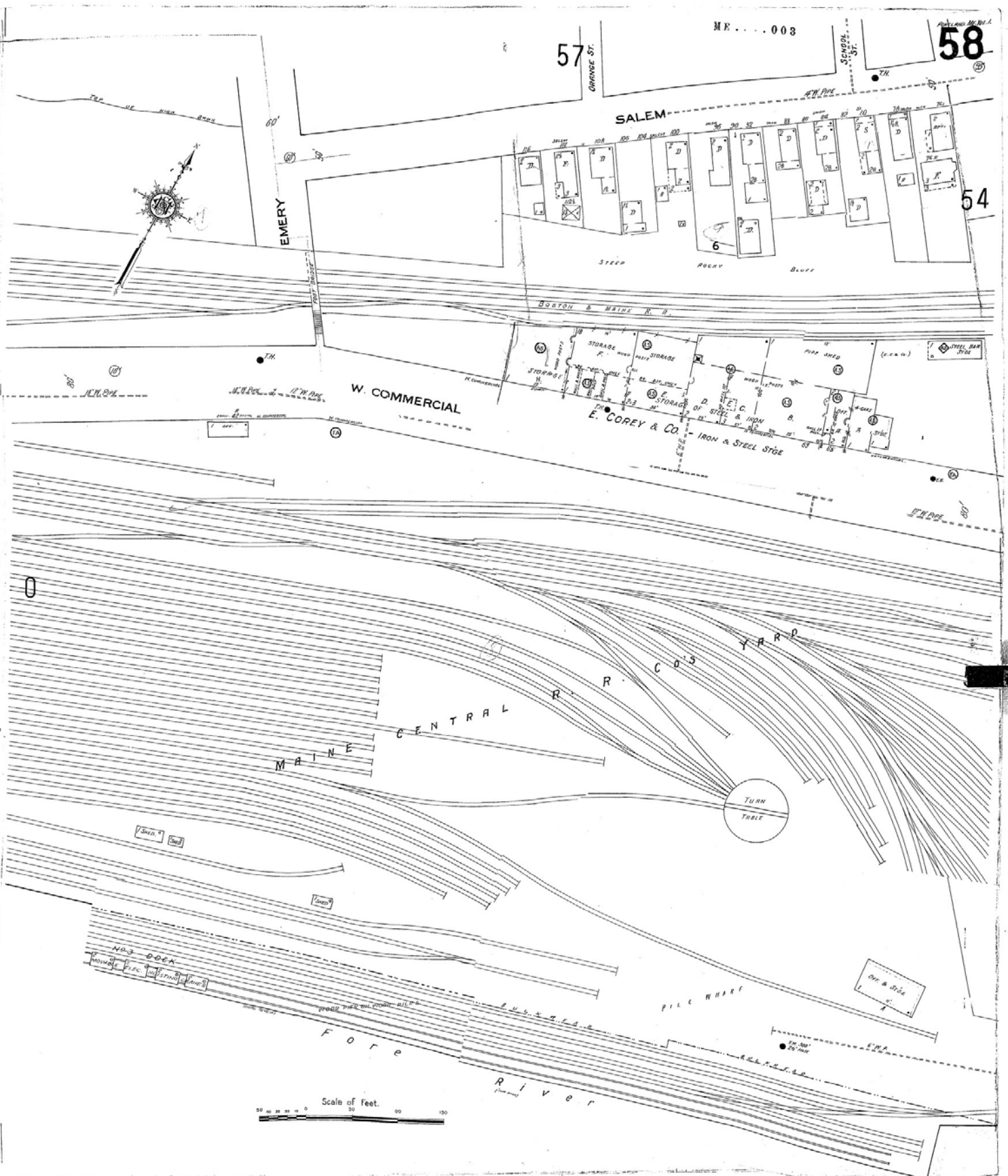
SINCE the 2/25/20 planning board workshop, where it was revealed that the Jon Jennings regime has been negotiating behind the scenes with the applicant for the better part of a year, including with Portland Trails (without any concurrent public notice or input) on this land swap to facilitate access to the applicant's structured parking and clinic, there has been zero mention of a contemplated land swap on any City Council agenda or of any of its various committees (which have been meeting remotely with some regularity since the corona pandemic began).

Neither Mayor Snyder nor her Council colleagues (including its at-large members) have done anything to my knowledge to provide any public notice or information regarding the details of a potential land swap involving the applicant and the City. This is concerning since the disposition of public assets goes to the very heart of our democratic government and the City Manager has no authority to be massaging a deal for a landowner using public resources without getting a formal green light to do so from our elected officials (preliminary discussions are one thing - getting all the way to a planning board public hearing is quite another).

Certainly the Planning Board should not be approving a multi-million dollar government-funded project that requires the use of city-owned land when the city has not even begun the process of discussing the land give-away with its own citizens. A project that is not even possible without the dual public subsidies of the long-term VA clinic lease and the Trump/GOP 2017 tax cut giveaway that created the objectionable "Opportunity Zone" (a program whereby rich people are allowed to shelter large amounts of otherwise taxable income in the specific precincts that Governor LePage's administration put in place prior to his leaving office) should not get a third public hand-out presented as a fait accompli.

This situation also has broader implications regarding Portland's housing production crisis, effective urbanism and Portland's notorious NIMBY culture whereby affluent homeowners (such as the mostly single-family Western Promenade neighborhood adjacent to the project site) get catered to at the expense of all other policy considerations. Those implications will be addressed in my "Part 2" email which I will hopefully deliver prior to Tuesday's remotely-held public hearing.

Thank you.



ME...003

57

58

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SALEM

EMERY

STEEL

PIREY

BLUFF

BOSTON & MAINE R. R.

W. COMMERCIAL

E. COREY & CO. - IRON & STEEL STGE

MAINE

CENTRAL

TURN TABLE

PILE WHARF

FORE

RIVER

Scale of Feet.

TECHNICAL BOOK



RLP# 36C10F18R0566

NOVEMBER 29, 2018

REVISED PROPOSAL

U.S. DEPARTMENT OF VETERANS AFFAIRS
COMMUNITY BASED OUTPATIENT CLINIC
PORTLAND, MAINE

FD | STONEWATER

J.B. BROWN & SONS

SMITHGROUP


LANDRY/FRENCH
CONSTRUCTION

PORTLAND, MAINE

151 WEST COMMERCIAL STREET



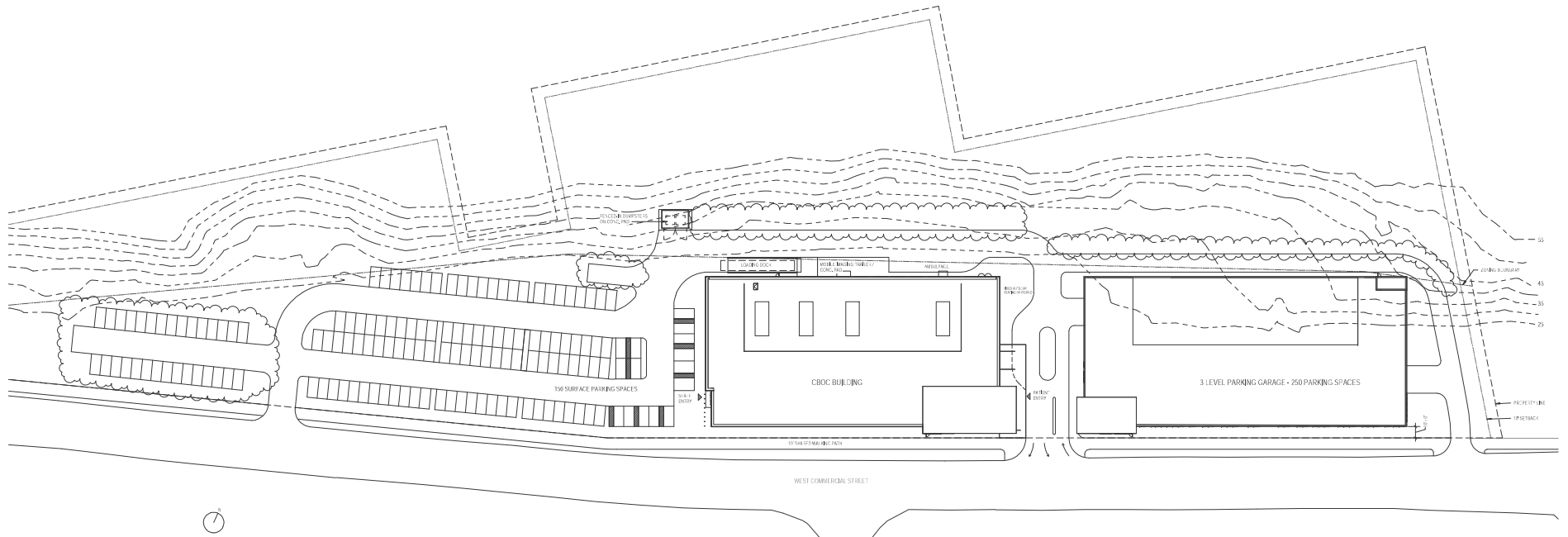
SMITHGROUP

FD | STONEWATER

VOLUME I OF I

ISSUED FOR:
Pricing Submission

ISSUE DATE:
11.29.18



1 SITE PLAN
SCALE: 1/8" = 1'-0"



Andrew Tufts <atufts@portlandmaine.gov>

VA Clinic Traffic Movement Permit Final Comments

1 message

Tom Errico <thomas.errico@tylin.com>

Thu, May 7, 2020 at 9:39 AM

To: Mike Tremblay <mtremblay@portlandmaine.gov>, Andrew Tufts <atufts@portlandmaine.gov>, Bruce Hyman <bhyman@portlandmaine.gov>, Jeremiah Bartlett <JBartlett@portlandmaine.gov>

Draft for Comments

Hi Andrew – The following is a status update of previous comments regarding the updated Section 7 Traffic Study (April 5, 2020), supporting traffic modeling and concept improvement plans for West Commercial Street. These represent final comments with specific conditions of approval.

1. I have reviewed the existing Design Hour traffic volume network during the AM and PM peak hours, and I find the volumes to be reasonable and acceptable.

Status: I have no further comment.

2. In general, I find the Site Traffic Assignment estimates to be reasonable. I would like you to be prepared to speak to the “Other Garage Spaces” trips and explain those numbers. I would note that it is a small volume and it doesn’t have a big impact on the conclusions of the study.

Status: The applicant has defined the trips generated by Others and I have no further comment.

3. Each individual Other Development trip assignment estimate that led to Figure 3 shall be provided. This does not need to be formal graphics, just supporting documentation.

Status: The requested information has been provided and I have no further comment.

4. I generally find the trip assignment routing to be acceptable. I would like to understand the assumptions used in assigning traffic to the project driveways.

Status: Documentation on traffic assignment has been provided and I have no further comment.

5. I generally concur with your safety assessment and mitigation suggestions. I need to coordinate with City staff on recommended strategies for implementation.

Status: In conjunction with MaineDOT Traffic Movement Permit Rules and Regulations the applicant shall implement the following safety improvements. The applicant shall provide design plans and specifications for the improvements for review and approval prior to implementation.

West Commercial Street at Beach Street

1. Provide **No Right Turn on Red** blank-out sign for the Beach Street approach.
2. Provide **Red Signal Ahead** advance traffic light warning sign on the outside of the curve for westbound Commercial Street traffic.

3. **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.**

West Commercial Street at Valley Street

1. **Provide ground-in skip lines for the dual left turn movements and right turn movements, using either traffic tape, thermoplastic, polyurea, or methyl methacrylate (MMA) marking material.**
2. **Provide white lane use and symbol markings on all lanes at the intersection, as well as providing lane use and symbol markings for the Valley Street approach back to the intersection with St. John Street.**

6. I generally find the SimTraffic analysis and conclusions to be reasonable. Please provide the Synchro networks for review. The model documents problems at West Commercial Street at Beach Street, Valley Street and Fore River Parkway. Mitigation options for these locations are limited. For this project it is very important that an improvement plan be developed for West Commercial Street at the project site and how the plan transitions and interfaces with other properties (driveways). As you know the project requires a waiver from City standards for the number of driveways and the improvement plan will assist in supporting the waiver (for example how it works with the shared Star Match Building driveway, the Beach Street left-turn lane, etc.). I would note the SimTraffic analysis estimates significant queuing at the employee driveway during the AM peak hour. When I get the model, I will review what is going on at this location.

Status: The applicant has provided the Synchro traffic models and I find the modeling results to be reasonable. The following should be noted:

- **The model indicates the main driveway and easterly driveway will operate at an acceptable level of service during peak hours. The westerly employee driveway will experience some delays and queuing entering the site during the AM peak hour. The applicant is recommending an improvement plan for West Commercial Street that will balance the left-turn storage length into the employee driveway with the Lane Drop Merge east of Cassidy Point Drive. In my professional opinion the recommended concept plan will provide acceptable conditions for access/egress movements at the site.**
- **The model indicates long delays and poor levels of service at the West Commercial Street/Beach Street intersection. The majority of site traffic is anticipated to originate or destined to the west and thus this project is not anticipated to have a significant impact at the subject intersection. No specific mitigation is recommended at this location given constraints. As noted above, safety improvements are recommended.**
- **The model did not include the traffic operations for pick-up/drop-off activity at the main driveway. It will be extremely important from a safety and mobility perspective that vehicle queues do not spill back into West Commercial Street. Refer to recommendations from Mike Tremblay regarding the requirement that the applicant conduct a monitoring study and implemented improvements if warranted.**

Please contact me if you have any questions.

Best regards,

Thomas A. Errico, PE
Senior Associate
Traffic Engineering Director

TYLIN INTERNATIONAL

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thomas.errico@tylin.com

5/7/2020

City of Portland Mail - VA Clinic Traffic Movement Permit Final Comments

Visit us online at www.tylin.com

[Twitter](#) | [Facebook](#) | [LinkedIn](#) | [Instagram](#)



Andrew Tufts <atufts@portlandmaine.gov>

VA Tree & Landscape Review

2 messages

Jeff Tarling <jst@portlandmaine.gov>
To: Andrew Tufts <atufts@portlandmaine.gov>

Thu, May 7, 2020 at 10:06 AM

Hi Andrew -

After visiting the site last week, the landscape treatment between the building and the multi use trail, adding a shade tree to the center driveway space opposite the flagpoles and the invasive plant treatment remain as the major tree / landscape concerns.

Due to the wide multi-use trail and overhead utility lines the typical regular street-tree spacing 45' on center that we like to see on a connector road like West Commercial Street seems improbable.

The best treatment for the narrow space between the roadway and walkway appears to be turf due to heavy snow load in the winter and overall appearance. We would recommend using the "Yardscaping / Bayscaping Seed Mix" developed by the State of Maine and available locally at Allen Sterling & Lothrop for all mowed lawn areas. This seed mix should perform well given the conditions and proximity to Casco Bay will require less fertilizer and should hold up to stress.

The space between the path and the building frontage could benefit from a mix of woody shrubs, herbaceous plant material, ornamental grasses given the fact that no street trees are proposed. This space could include regular lawn in [places.as](#) well but we suggest due to the long expansive frontage having some landscape texture and treatment would be helpful.

Parking lot trees & landscape - All parking lots should meet the required landscape treatment which the plan seems to address along with the flexibility of using some of the smaller sized plant material specified for the fringe areas.

Invasive Plant control - the large space outside the project construction site contains an extensive amount of invasive plants, mostly Japanese Knotweed, Bittersweet. This space should be managed to control / contain invasive plants from further spreading. This could be done prior to or at the same time as the site work using mechanical removal (brush mowing) and chemical control as recommended. The site has been vacant for decades and it is typical of such sites to contain the mentioned species. We are meeting with Nancy Olmsted from the Maine Natural Areas program who oversees Invasive Plant projects in Maine for recommendations.

Open Space - The aforementioned open space between the project and the Danforth Street residential properties might be an opportunity for a land trust like Portland Trails to partner on trail and land management knowing that good access helps prevent unwanted activities and could help manage the space. This note is suggestive as a possible outcome to manage the vacant / open space portion of the site.

<https://www.allensterlinglothrop.com/lawn-seeds>

Jeff Tarling
City Arborist - City of Portland Maine
Parks, Recreation & Facilities Department
Forestry & Horticulture
[212 Canco Road - Suite A](#)
[Portland, ME. 04103](#)
(207) 808-5400
jst@portlandmaine.gov

Andrew Tufts <atufts@portlandmaine.gov>
To: Jeff Tarling <jst@portlandmaine.gov>

Thu, May 7, 2020 at 10:28 AM

Thanks Jeff, this is great!

[Quoted text hidden]

--

Andrew Tufts

5/7/2020

City of Portland Mail - VA Tree & Landscape Review

Planner
Planning and Urban Development Department

389 Congress Street 4th Floor
Portland, ME 04101
atufts@portlandmaine.gov
(207) 874-8724

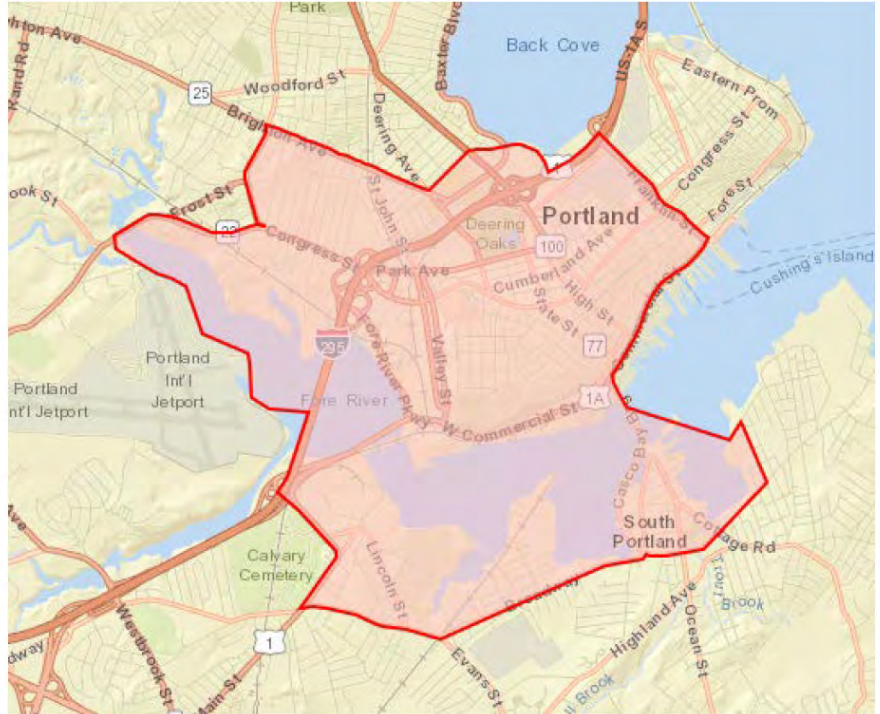
GENERAL APPLICATION DOCUMENT

PROJECT DESCRIPTION

PROJECT OVERVIEW

In July 2018, the Department of Veterans Affairs issued a Request for Lease Proposal (RLP) No. 36C10F18R0566 seeking approximately 62,300 SF of building space for a Community Based Outpatient Clinic (CBOC) and parking capacity for 400 parking spaces within an area as identified on Figure 1.

The development team of FB Stonewater, JB Brown & Sons, Landry French Construction, Smith Group Architecture and Gorrill Palmer was assembled and submitted a Proposal to develop vacant property along West Commercial Street. The property, schematic plans and overall lease agreement terms were found to be acceptable to the VA and in September 2019, the developer and VA initiated actions to proceed with design and permitting of the VA Clinic at the West Commercial Street site.



DEVELOPMENT PROPOSAL

LOCATION

The proposed site for the CBOC is located on West Commercial Street in Portland, ME within the Area of Consideration as shown in the RLP. The site is 8.40 acres in size and is unencumbered by existing structures for preservation, reuse, or demolition. An abandoned rail spur exists on the site without any record of an easement found. The developable portion of the site has approximately 5.17 acres of land and 1,400 LF of street frontage on West Commercial Street. Approximately 4 acres of the developable site is Zoned B-5b, Commercial, which is where the CBOC will be located. The other 4 acres (on the uphill slope) is zoned R-4, Residential. A Medical Clinic is a permitted use in the Commercial Zone and this makes the CBOC a use-by-right without need to seek special permitting on the site.

The proposed CBOC site is near I-295 and I-95 (Maine Turnpike) providing convenient access from the north and south and Route 77 providing access from South Portland and Cape Elizabeth and points west. The site is also approximately one-half of a mile from the western edge of Portland's Historic downtown and Central Business District. Maine Medical Center, a 637-bed teaching hospital, is less than one-mile away to the north of the CBOC site and Mercy Hospital's Fore River Campus is located less than ½ mile from the site. The topography of the site includes a relatively level area (coinciding with the commercial zone) and a steeper area which is part of the residential zone. The site provides views south to the Fore River, South Portland

and Cape Elizabeth. West Commercial Street is a main entrance route to Portland and the CBOC's location and orientation will serve as a gateway to patients and travelers. As a result, the CBOC will visually communicate the VA's brand to the local public, establishing the VA as a recognized identity in the Portland community.



Important features that support the site selection by the VA include:

- Site is within the RLP's Area of Consideration;
- Zoned for Medical Clinic use;
- Conveniently accessed by major highways and downtown Portland; and
- Prominent site for VA branding.

SITE DESIGN

Clarity of site circulation is paramount for the success of the building, mitigating visitor anxiety at arrival and departure. The main public entrance to the 62,170 SF two-story (34,155 SF footprint) CBOC is located on West Commercial Street. The entrance is made prominent by elevated architectural masses on corresponding corners of the Clinic and a proposed 382-space precast concrete parking structure. A canopy is provided at the CBOC's entrance with space for three cars to drop-off and pickup. An outside seating gathering plaza is located adjacent to the entrance to allow family and patients a chance to spend time outside the CBOC in good weather.

The entrance to the 382-space patient garage is immediately to the east, directly off the entrance drive. The parking structure has three levels (two covered from weather) and is served by two passenger elevators in a weather tight vestibule. The garage pedestrian entrance is across from the CBOC's main entrance with well-marked crosswalks between them. The garage has two vehicular exits, one at the main entrance drive for quick pick-up and another at its east end leading to West Commercial

Staff parking is located on the west side of the Clinic and contains 152 spaces with its own entrance from West Commercial Street. A staff building entrance is located adjacent to the staff parking. Both the main

and staff entrances are separated from drive lanes by site bollards. Service vehicles enter at the east end of the site (behind the garage) and are restricted to the drive lane behind the garage and CBOC. The ambulance dock, mobile imaging station, dumpsters and loading dock are located behind the Clinic, out of site from patients and visitors. The CBOC and garage are located close to the street to limit the need for cutting into the hill behind the building and to control site costs. The basis for positioning of the buildings is primarily to allow patient/visitors access to the garage while being separated from the staff parking area. VA staff are to also enter the building separately from patients/visitors. Due to the long linear nature of the site, three access driveways are proposed. Each will have ample separation from nearby driveways including those on the opposite side of the street.

Service vehicles will exit the site onto West Commercial at the west end of the staff parking. Patient and service traffic are designed to avoid crossing each other on the site as much as possible. Development of this site requires modest cutting into the slope on its north side. Covered entries are provided at the mobile imaging pad, ambulance entry and a single loading dock at the rear of the building. The CBOC's main entrance is over 1,000' from the nearest main intersection (West Commercial Street and Beach Street).

Along the site frontage, the site design includes the development of a 10' wide paved pathway. This is consistent with the City's long-term goals as outlined in the West Commercial Street Multi-Modal Corridor Study. The City is pursuing development of the pathway from a point west of the site to a point east of the site. The development of the pathway along the site frontage will involve new curbing placement, a retaining wall to overcome topography and utility adjustments to the poles and to the existing sewer interceptor. The site lies within the Waterfront TIF District and it is expected that tax revenue attributable to the proposed development will be used to support the costs of this pathway.

Feature include:

- Prominent site entrance with segregated traffic patterns;
- Covered patient parking adjacent to the CBOC;
- Separate staff parking and entrance; and
- Discreetly located building service area.

BUILDING DESIGN

The primary concept for the buildings aims at creating a gateway through which patients and visitors enter the site, offering a clear means of access from West Commercial Street. This is achieved by raising the public lobbies and vertical circulation in the front corners of the Clinic and parking structure as a welcoming beacon. The design extends the public zones for each building across the frontage along West Commercial to take advantage of views to the Fore River and to create a positive environment for patients and family. Full-height glazing in the Clinic ensures that natural light will not only shower the public zones, but that it will also reach deep down clinical corridors to enrich the caregiver experience, as well.

The corner lobbies which create the gateway are designed with glass, not only to offer intelligibility to the users, but also to honor our veterans through the use of patriotic super-graphics on the backdrop of each lobby. The building communicates appreciation for the sacrifice of our service members, as well as give them



a respectful welcome at the front door. This motif is carried through the materiality of the building with a dual meaning for each material, one which speaks to the character of those for which the building serves, and the other to reference the local vernacular. Corrugated metal represents the unwavering strength of our service members and speaks to industrial military hangars and barracks, as well as referencing Portland's waterfront industry and shipping containers.

Along the parking structure, the corrugated metal is perforated and backlit, illustrating the underlying responsibility of the call to arms. In the same spirit, a randomized color variation in the brick represents the diverse cultural backgrounds of our veterans, while also nodding to Portland's traditional New England red brick. On the rear elevation, out of public view, a more cost-effective concrete masonry unit veneer is used.

BUILDING COMPONENTS

The Clinic is broken up into two major components: the frontage, which celebrates public functions, and the clinical box, designed for efficient team-based care. The building design climbs two stories with rooftop mechanical units, screened with a similar corrugated metal as the street-facing façade. The building envelope is designed to respond to the challenges of the local climate. Walls are designed to prevent moisture penetration and minimize heat loss and gain throughout the year. Exterior steel and metals are coated or galvanized to prevent corrosion, and the building envelope will minimize air leakage to and from occupied spaces and ensure condensation control with a continuous weather barrier. The brick, composite metal panel, and corrugated metal panel systems will layer onto 3" rigid insulation, air vapor barrier, exterior sheathing, and 8" cold-formed metal framing. The parking structure will be selectively clad in a randomized fashion with clip-mounted, perforated, and back-lit Kalzip metal panels.

All window glazing shall be low-E, insulated and laminated. Storefront doors shall be low-E, insulated and tinted. Window systems shall be double glazed and provided with a continuous thermal break between inner and outer sash. Windows in the clinical areas have been appropriately sized to allow natural light in and afford privacy to patients and staff. Frames shall be thermally broken. Windows in the security exam or holding rooms will be 7/16" thick laminated glass. The laminated glass will be placed on the interior of double-

glazed windows. The roof system will be designed according to the recommendations of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual. Low slope roof systems will be designed per FM global criteria, to local environmental conditions, utilizing sloped structural system. Roofing membrane system will be a layering of white EPDM roofing, coverboard, tapered insulation, vapor barrier, on metal decking. Roof walkways will be made of prefabricated roof walk pad with nonslip surfaces, on access routes to mechanical equipment that requires recurrent maintenance. Roof ladders, stair, and platforms will be provided as necessary to ensure the safety of maintenance workers.

Insulated galvanized metal doors or aluminum storefront doors will be provided, as appropriate. All doors will be a minimum of 3 feet wide in non-patient areas, and 3 feet 6 inches in patient areas. The main entrance doors will be automatic sliding doors of anodized aluminum construction with safety glazing. They will comply with the same energy efficiency requirements as the window systems. At the main entrance, staff entrance, and ambulance entrance, vestibules will provide an airlock. Other swinging exterior doors will be heavy duty, insulated, full-flush hollow steel construction. All exterior doors will be weather-stripped, self-closing, and outward opening. Latch guards and hinges with non-removable pins will deter tampering or unauthorized entry. Exterior details will be designed to preempt bird roosting.

Exterior structures that will be included in the overall campus design scheme include:

- Covered vehicle drop-off area at the main building entrance
- Staff-entry canopy
- Ambulance drop-off and canopy
- Mobile imaging pad and canopy
- Covered loading dock area

All covered walkways and service overhangs will be constructed of non-combustible materials and are integrated into the architectural style of the building. Walkways will be illuminated with integrated fixtures controlled by the site lighting system. Where required by the AHJ, walkways and overhangs will be fully sprinklered. Any service and equipment yards will be blocked from public view by screen walls that are architecturally compatible with the main building. The facility is designed to meet Federal and Local requirements for fire safety, physical security, accessibility, seismic, and sustainability standards per the terms of the solicitation for proposals and will be fully compatible with the VA's intended use.

Features include:

- Modern quality building with durable exterior materials;
- Articulated building elements for pleasing aesthetics and patient way finding;
- Covered and protected entrances; and
- Weather resistant and energy efficient envelope.

PLANNING & TENANT IMPROVEMENT

The VA space program is located on two floors in the CBOC. The program spaces have been laid-out with an emphasis on efficient and understandable layouts. The first floor is populated with Patient Aligned Care Team (PACT) spaces for ease of access to the greatest number of patients. Specialty clinics such as dental, eye, audiology, and mental health are located on the second level with ease of access by two-passenger elevators for redundancy. One freight elevator is also included. Each floor is organized by a light-filled lobby

and linear waiting area providing quick access to patient care areas. Floor plans are easily understandable with super graphics at clinic entrances and open patient corridors and secured staff circulation cores. All corridors are 6 feet in width and security measures will be included. Exterior windows are provided at the end of major circulation corridors for natural light and connection to the exterior. Minimum 9'-0" high ceilings will be provided throughout with 10' ceilings in larger spaces (>500SF).

Features include:

- Patient-centered design focused around team- based care;
- Efficient layouts for state-of-the-art treatment;
- Clear and consistent patient waiting and circulation patterns with abundant natural light; and
- Separation of open patient and secured staff circulation.

EXISTING CONDITIONS

The site is characterized as a relatively open space with limited vegetation of the lower flat area adjacent the street and a denser vegetative coverage along the steeper embankment at the rear of the site. A portion of the site frontage contains a granular lot area where vehicles, trailers, and equipment occasionally are parked. The site was formerly a rail yard and remnant tracks remain on the property.

- **Drainage** – Drainage in West Commercial Street is limited to just several catch basins that are tied to the CSO system. These are located to the west end of the site, thus the ability to convey stormwater off the site will require careful consideration.
- **Soils/Topography** – Preliminary investigations conducted by S.W. Cole Engineering and Summit Geoengineering indicate site soils consist of sand and gravel of thickness from 25' to 35' below grade with no initial evidence of shallow ledge, at least within the likely development area adjacent West Commercial Street. The top 2-foot layer of material does contain evidence of the site's historical rail use, including coal ash and brick fragments and this material will be properly buried onsite or removed for offsite disposal. This is relatively common on the Portland Peninsula. We are not aware of any wetland or natural resources on the site as evidenced by a wetlands review conducted by Rich Jordon PWS/CPESC, formerly of TRC, who found none of those features on the site. Depth to groundwater exceeds 10' thus, no impacts or constraints due to shallow groundwater are anticipated. The building foundations are planned as spread footings and deep foundations such as piles or other ground improvements are not anticipated for construction.

The site topography consists of ground elevations varying from elevation 20.0' (NGVD29=City Datum) to elevation 25.0' within the flatter area from the ROW line back 160' or so. A steeper incline has the topography rising from elevation 25.0' up to elevation 95.0' or so at the rear of the property. The low sag in West Commercial Street is about elevation 14.85' and the crest in the street is about elevation 23.5'.

- **Surrounding Land Use** – The site is located along a gateway to the waterfront. AADT traffic volumes¹ along West Commercial Street are as follows:
 - AADT 16 US 1A Commercial Street Eastbound E/O Cassidy Point – 10,320
 - AADT 16 US 1A Commercial Street Westbound E/O Cassidy Point - 10,110

¹ See 2017 Maine DOT Transportation Count Book

The site is located directly opposite the relatively new Canal Landing Boat repair and maintenance facility that occupies about 17 acres on the south side of the street. That facility includes multiple large buildings and a recently completed travel lift basin along the site's privately-owned waterfront. The boat facility includes three driveway openings along West Commercial Street. West Commercial Street in front of most of the site consists of an 80' wide ROW and approximately 44' of pavement (containing two 14' wide travel lanes and 8' paved shoulders on each side).

North of the site there are residential properties along Danforth Street situated prominently well above due to a steep rise in topography. To the east is located commercial office property and to the west is a small seasonal restaurant. Southeast of the site is the Maine DOT International Marine Terminal that has been recently expanded for additional rail operations and support of Eimskip shipping terminal activity.

UTILITIES

- **Sanitary Sewer** – There is an existing 48" RCP Interceptor sewer located generally along the length of the site frontage of West Commercial Street. Tie-in to this sewer pipe will be required along with backflow prevention. The line is less than 10' off the front line and perhaps as little as 5' off the front line; it does not appear the pipe will result in conflict with any foundation construction, particularly for any building portion that is within the 10' maximum setback zone. Temporary sheeting and shoring during foundation installation may be required. There are also interceptor structures located on the far west end of the site that relate to the CSO and overflow lines to the river.
- **Water Supply** – There is an existing 16" supply main within West Commercial Street, running the length of the site. The main is located however mostly on the south side of the street, thus trenching across West Commercial Street will be required. This will involve multiple crossing of other utilities in the street that are of major consequence, including the 48" sanitary interceptor, an existing oil-encased 115 KVA underground electrical transmission line, and a 10" high pressure gas main. PWD records indicate water flows more than 1,200 GPM with pressures exceeding 100 psi, available in the vicinity.
- **Natural Gas** – A high pressure main is located within West Commercial Street. We believe that natural gas service will be readily available to the project, subject to confirmation by Unitil who is the supplier in the area.
- **Power** – Central Maine Power maintains overhead three phase electrical distribution along West Commercial Street in front of the site. There is an existing overhead system running the length of the site frontage. The location of the overhead lines will require careful review to assess setback from any proposed building walls and roofline, particularly if any portion of the building is located within the 10' maximum property line setback. CMP typically requires a 10' separation from their overhead lines to the building, and this may require even greater separation during construction. The new facility requires an underground 3-phase service extension to a new pad mount transformer(s).

CMP also maintains an existing underground oil-encased 115 KVA transmission line that is located along the site frontage. The line is generally located 24" to 48" below grade. CMP also maintains an underground distribution bank on the south side West Commercial Street. Neither of these facilities are expected to be impacted by the development.

- **Communications** – Consolidated Communications (aka Fairpoint) and Spectrum provide telephone and cable services in the region and both have facilities on the existing overheads fronting the site. Other providers include Firstlight aka Oxford Networks, Maine Fiber, and the Portland Fire Department, all of whom may also have wires on the poles. High-speed data communications are also likely available at this location, subject to confirmation by one or more of these providers.

CONSTRUCTION SCHEDULE

The project is currently under design with a targeted construction start date for March 2020 and construction completion in early 2022.

A Construction Management Plan has been prepared by Landry French Construction and is appended to the Construction Management Plan section of this application.

GENERAL APPLICATION DOCUMENTS

RIGHT, TITLE & INTEREST

J.B. Brown & Sons currently owns the property as evidenced in the deed recorded in CCRD Book 29147 page 254 attached to this section. FDS JBB Portland LLC currently is entered into a Lease Agreement with the federal government for a 20-year period as evidenced by the attached redacted documents.

RELEASE DEED

MAINE CENTRAL RAILROAD COMPANY, a corporation duly organized and existing under the laws of the State of Maine, with offices at 1700 Iron Horse Park, North Billerica, Middlesex County, Massachusetts (the "Grantor") in consideration of Seven Hundred Ninety Three Thousand and 00/100 (\$793,000.00) Dollars paid to it by **J.B. BROWN & SONS**, with a mailing address of 36 Danforth Street, Portland, ME 04101 (the "Grantee") hereby grants to the Grantee all the Grantor's right, title and interest, without any warranties or covenants of title whatsoever, in a certain parcel of land, and the buildings, bridges, structures, crossings, fixtures and improvements thereon, if any, situated in Portland, County of Cumberland, State of Maine (the "Premises") described as follows:

SEE EXHIBIT "A" ATTACHED HERETO AND
MADE A PART HEREOF BY THIS REFERENCE.

This conveyance is subject to the following reservations, conditions, covenants and agreements:

1. This conveyance is made without granting any right of way, either by necessity or otherwise, over any remaining land or location of the Grantor.
2. ~~The Grantor hereby reserves an exclusive, permanent right of way and easement in, on, over, under, across and through the Premises for the purpose of accessing, constructing, installing, operating, maintaining, modifying, repairing, replacing, relocating and removing a telecommunications system or other system for transmission of intelligence or information by any means, whether now existing or hereafter devised, including such poles, pipes, wires, fibers, fiberoptic cables, repeater stations, attachments, appurtenances, structures or other equipment and property of any description necessary or useful for the same (the "Telecommunications Easement"). The Grantor further reserves the right to freely lease, license, mortgage, assign, pledge and otherwise alienate the Telecommunications Easement. The Grantee hereby covenants with the Grantor to recognize the Telecommunications Easement and, without the payment of any further consideration, to execute, acknowledge and deliver such instruments suitable for recording with the registry of deeds as the Grantor may reasonably~~

MAINE REAL ESTATE TAX PAID

~~require to acknowledge title to the Telecommunications Easement in the Grantor. The Grantor covenants to reasonably repair and restore the surface of the easement area after any work.~~

3. ~~The Grantor excepts from this conveyance any and all railroad tracks, railroad track materials (including, but not limited to, ties, connections, switches and ballast) and/or related equipment of any description located in whole or in part within the Premises (the "Trackage") and this conveyance is subject to the right of the Grantor to enter the Premises from time to time and at any and all times within the ninety (90) day period commencing with and subsequent to the date of delivery of this deed, with such men, equipment and materials as, in the reasonable opinion of the Principal Engineering Officer of the Grantor, are necessary for the removal of the Trackage. Days during the months of December, January, February and March shall not be included in the aforesaid ninety (90) day period. If the Trackage is not removed from the Premises by the expiration of said ninety (90) day period, the Trackage shall be deemed abandoned by the Grantor and shall then become the property of the Grantee.~~
4. ~~The Grantor excepts from this conveyance any and all advertising signs and/or billboards located upon the Premises which are not owned by the Grantor. Furthermore, this conveyance is subject to the right of the owners of said signs and/or billboards to go upon the Premises and remove them within ninety (90) days from the date of delivery of this deed.~~
5. By the acceptance of this deed and as part consideration therefor, the Grantee hereby assumes any and all agreements, covenants, obligations and liabilities of the Grantor in respect to any underground facilities, drainage culverts, walls, crossings and/or other structures of any nature and description located in whole or in part within the Premises.
6. By the acceptance of this deed and as part consideration therefor, the Grantee agrees to irrevocably waive, give up and renounce any and all claims or causes of action against the Grantor in respect of claims, suits and/or enforcement actions (including any administrative or judicial proceedings and any remedial, removal or response actions) ever asserted, threatened, instituted or requested by any person and/or governmental agency on account of: (a) any release of oil or hazardous materials or substances of any description on, upon or into the Premises in contravention of any ordinance, law or statute (including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Section 9601, et seq., as amended); and (b) any and all damage to real or personal property, natural resources and/or harm or injury to persons alleged to have resulted from such release of oil or hazardous materials or substances.

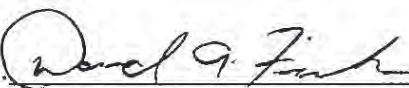
7. ~~By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to build and forever maintain fences (together with any necessary gates), suitable to the Principal Engineering Officer of the Grantor, along the boundaries of the Premises which are common to remaining land or location of the Grantor (the "Fences"), if Fences are ever required in the sole and reasonable opinion of said Principal Engineering Officer.~~
8. ~~This conveyance is subject to the following restriction for the benefit of other land or location of the Grantor, to wit: that from the date of delivery of this deed, the Grantor shall not be liable to the Grantee or any lessee or user of the Premises (or any part thereof) for any damage to any buildings or property upon them caused by fire, whether communicated directly or indirectly by or from locomotive engines of any description upon the railroad operated by the Grantor, or otherwise.~~
9. ~~By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to make no use of the Premises which, in the sole and reasonable opinion of the Principal Engineering Officer of the Grantor, adversely affects, increases or decreases drainage to, from, upon or in any remaining land or location of the Grantor. The Grantee agrees to indemnify and save the Grantor harmless from and against any and all loss, cost, damage or expense including, but not limited to, the cost of defending all claims and/or suits for property damage, personal injury or death arising out of or in any way attributable to any breach of the foregoing covenant.~~
10. ~~The Grantor excepts from this conveyance any and all overhead, surface or underground signal and communication line facilities of the Grantor located within the limits of the Premises and this conveyance is subject to the Grantor's use of any such facilities in their present locations and entry upon the Premises from time to time to maintain, repair, replace, renew, relay or remove such facilities.~~
11. The strikeout sections in this Deed are intentionally deleted.
12. Whenever used in this deed, the term "Grantor" shall not only refer to the **MAINE CENTRAL RAILROAD COMPANY**, but also its successors, assigns and affiliates and the term "Grantee" shall not only refer to the above-named Grantee, but also the Grantee's successors, assigns and grantees, as the case may be.

13. The several exceptions, reservations, conditions, covenants and agreements contained in this deed shall be deemed to run with the land and be binding upon the Grantee forever. In addition to the acceptance and recording of this deed, the Grantee hereby signifies assent to the said several exceptions, reservations, conditions, covenants and agreements, by joining in its execution.

IN WITNESS WHEREOF, the said **MAINE CENTRAL RAILROAD COMPANY** has caused this release deed to be executed in its name and its corporate seal to be hereto affixed by David A. Fink, its President, thereunto duly authorized this 21st day of November, 2011.

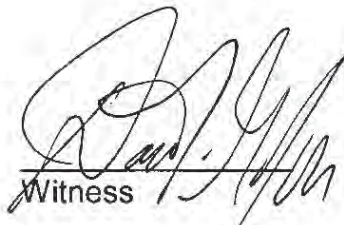
GRANTOR:
MAINE CENTRAL RAILROAD COMPANY


Witness

By: 
David A. Fink, President

SEAL

GRANTEE:
J.B. BROWN & SONS


Witness

By: 

Print Name: Vincent P. Veroneau

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

11/21, 2011

On this 21st day of November, 2011, before me, the undersigned notary public, personally appeared the above-named David A. Fink, the President of the **MAINE CENTRAL RAILROAD COMPANY** as aforesaid, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Notary Public: Roland L. Theriault

My Commission Expires: _____



ROLAND L. THERIAULT
Notary Public
Commonwealth of Massachusetts
My Commission Expires
August 5, 2016

STATE OF MAINE

Cumberland, ss.

11/23, 2011

On this 23rd day of November, 2011, before me, the undersigned notary public, personally appeared the above-named Vincent P. Veroneau, of **J.B. Brown & Sons**, as aforesaid, proved to me through satisfactory evidence of identification, which was personally known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Notary Public: David L. Galgay Jr.

My Commission Expires: _____

Attorney at Law -

David L. Galgay Jr.

BAR # 003643

Exhibit A

A certain lot or parcel of land, with the buildings thereon, situated on the northerly side of West Commercial Street, in the City of Portland, County of Cumberland, and State of Maine, bounded and described as follows:

Beginning at a point on the northerly sideline of West Commercial Street, on the westerly sideline of the former Emery Street now land of J. B. Brown and Sons;

Thence, S 66°06'27" W along the northerly sideline of said West Commercial Street 784.47 feet;

Thence, S 71°39'57" W along the northerly sideline of said West Commercial Street 731.36 feet;

Thence, S 80°52'21" W along the northerly sideline of said West Commercial street 437.92 feet to the West Commercial Street off-ramp;

Thence, along said off-ramp, the following courses and distances:

Northwesterly, along a curve to the right having a radius of 1023.32 feet, a delta of 7°02'02", and whose chord bears N 88°49'29" W, a distance of 125.55 feet, an arc length of 125.63 feet;

N 66°06'38" W a distance of 93.96 feet;

Northwesterly, along a curve to the left, having a radius of 194.00 feet, a delta of 38°27'00", and whose chord bears N 85°20'08" W, a distance of 127.76 feet, an arc length of 130.19 feet;

S 75°26'22" W a distance of 33.57 feet;

Thence; N 81°44'16" W along land now or formerly of the State of Maine 171.41 feet;

Thence, N 08°15'44" E along land of said State of Maine 22.46 feet to the southerly sideline of Danforth Street;

Thence along said Danforth Street the following courses and distances:

N 83°43'02" E a distance of 96.39 feet;

Northeasterly, along a curve to the left, having a radius of 1042.16 feet, a delta of 12°51'52", and whose chord bears N 77°17'06" E, a distance of 233.50 feet, an arc length of 233.99 feet;

N 70°51'10" E a distance of 187.93 feet;

Northeasterly, along a curve to the right, having a radius of 800.00 feet, a delta of 2°21'41", and whose chord bears N 72°02'04" E, a distance of 32.97 feet, an arc length of 32.97 feet to land now or formerly of South Rise Condominiums;

Thence along said South Rise Condominium land the following courses and distances:

S 11°41'22" E a distance of 168.00 feet;

N 81°56'51" E a distance of 271.00 feet;

N 77°01'13" E a distance of 96.62 feet;

N 75°17'24" E a distance of 51.37 feet to land now or formerly of Shaw;

Thence, N 72°46'26" E along land of said Shaw 94.47 feet;

Thence, N 35°07'51" W along land of said Shaw 69.73 feet to the southerly terminus of "K" Street;

Thence, along said "K" Street, along the southerly side of a 40 foot passageway and the terminus of "E" Street the following courses and distances:

N 55°46'28" E a distance of 17.74 feet;

N 55°46'28" E a distance of 58.47 feet;

N 54°19'46" E a distance of 397.81 feet to land now or formerly of the City of Portland;

Thence, S 35°05'23" E along land of said City of Portland 56.55 feet;

Thence, N 69°03'30" E along land of said City of Portland and land now or formerly of Noonan 85.21 feet;

Thence, N 34°36'51" W along land of said Noonan 92.60 feet to land now or formerly of McFarland;

Thence, N 54°37'05" E along land now or formerly of McFarland, Curtis, Dilworth, Moberg, McDonough and Robertson 367.27 feet to land now or formerly of Pollard & Lantos;

Thence, S 35°47'03" E along land of said Pollard & Lantos 119.22 feet;

Thence, N 54°52'09" E along land of said Pollard & Lantos, and land now or formerly of Bessire and Dyro 441.22 feet to the centerline of Emery Street;

Thence, S 35°05'32" E along the centerline of Emery Street, 153.86 feet;

Thence, N 55°14'50" E a distance of 30.00 feet to the easterly sideline of Emery Street;

Thence, S 35°05'32" E along said easterly sideline, 24.61 feet to the intersection of the easterly side of Emery Street at its intersection with the southerly sideline of Salem Street;

Thence, S 55°14'50" W along land now or formerly of J. B. Brown 60.00 feet;

Thence, S 35°05'22" E along land now or formerly of J. B. Brown 172.39 feet to West Commercial Street and the point of beginning, containing 10.65 acres, more or less. Also

conveying all right, title and interest of Maine Central Railroad Company in and to Emery Street lying within and adjacent to the land herein conveyed.

Reference, is made to a survey by Owen Haskell, Inc. dated October 13, 2011 Job # 2010-095P for a further description of the above described premises.

Reference is also made to the premises conveyed in that certain deed from the Portland Terminal Company to the Maine Central Railroad Company dated December 30, 1985 and recorded in the Cumberland County Registry of Deeds in Book 7026, Page 192.

3607968_1

Received
Recorded Register of Deeds
Nov 23, 2011 12:54:33P
Cumberland County
Pamela E. Lovley

GENERAL APPLICATION DOCUMENT

TECHNICAL CAPABILITY

The applicant has retained a highly qualified team of professionals to undertake planning, permitting and design tasks on this project. Services will be provided by the following companies and their respective team leaders:

<i>Civil Engineer</i>	Stephen Bushey, P.E. Gorrill-Palmer Consulting Engineers 707 Sable Oaks Drive South Portland, Maine 04106 (207) 772-2515 – Work sbushey@gorrillpalmer.com
<i>Architect</i>	VA Clinic SmithGroup 100 High Street, Suite 1800 Boston, MA 02110 (617)-502-3558 Attn: Greg Heppner, AIA, NCARB Greg.heppner@smithgroup.com Garage Ryan Senatore 500 Congress Street, Suite 2 Portland, Maine 04101 (207) 747-5159 ryan@senatorearchitecture.com
<i>Surveyor</i>	Nick Elliston Titcomb Associates 133 Gray Road Falmouth, ME 04105 (207) 797-9199 – Work Nelliston@titcombsurvey.com
<i>Traffic Engineer</i>	William Bray, P.E. Traffic Solutions 17 Mountview Drive Gorham, Maine 04038 (207) 400-6890 – Work trafficsolutions@maine.rr.com
<i>Geotechnical Consultant</i>	Bill Peterlien, P.E. Summit Geoengineering Services 145 Lisbon Street PO BOX 7216 Lewiston, Maine 04243 (207) 576-3313 bpeterlein@summitgeoeng.com

<i>Developer</i>	Claiborne Williams FD Stonewater 1001 N. 19th Street, Suite 930 Arlington, VA 22209 (202) 669-8142 cwilliams@fdstonewater.com Vin Veroneau – President/CEO J.B. Brown & Sons 10 Free Street Portland, Maine 04101 (207) 774-5908 veroneau@jbbrown.com
<i>Construction Manager</i>	Kevin French Landry French Construction 160 Pleasant Hill Road Scarborough, Maine 04074 (207) 730-5563 kfrench@landryfrenchconstruction.com

The team of consultants retained has expertise and experience in the design of similar institutional projects. Resumes of key personnel for development team can be provided upon request.

GENERAL APPLICATION DOCUMENT

FINANCIAL CAPACITY

The Applicant, FBS JBB Portland, LLC has adequate financial resources to undertake this project as evidenced by the following:

- FB Stonewater is a boutique real estate brokerage, investment, development and asset management firm with national capabilities. They have completed over 1 million square feet of high-quality development projects for federal and commercial tenants while also managed over \$500 million in real estate assets, totaling more than 5 million square feet. The firm has greater than 25 years of ownership and asset management and considered highly qualified to manage and support the proposed project. See <http://fdstonewater.com/html/> for further background on the firm.
- JB Brown & Sons is a commercial property management and development company with perhaps the longest history of property ownership in the City. Long known for its stable ownership and conservative long-term outlook of real estate in the City, the firms partnering with FB Stonewater will provide a most capable team to meet the needs of the Veterans Administration. JB Brown & Sons has owned the development site since 2011. The property was original owned by JJB going back to the 1800's until Portland Terminal Co purchased in the early 1900s and conducted railroad activity on the site for nearly 100 years.

The estimated full cost of the project is projected to be \$30 million. A copy of the Financial Capacity letter is included with this section.



November 12, 2019

City of Portland Planning Division
389 Congress Street, 4th Floor
Portland, ME 04101

Re: J.B. Brown & Sons - VA Building - West Commercial Street

Dear Planning Board Members:

I am writing to support the proposed Veteran's Administration project on West Commercial Street being developed by FDS JBB Portland JV, LLC.

J.B. Brown & Sons, a partner in the development company, is an experienced developer and commercial real estate owner and manager in the Greater Portland area. The company has completed a number of successful projects in recent years including the 25 High Street condominium project, the Portland Marriott Courtyard, and is currently under construction of the recently approved residential/retail building at 40 Free Street in Portland, to name a few. Financially, the company is stable with sufficient cash flow, liquidity, and balance sheet strength to finance the project. We provide financing for a number of the company's projects, and all loan obligations and deposit accounts with NBT Bank have been handled in a fully satisfactory manner.

We have reviewed the preliminary information for the proposed project, and based on the information we have, NBT Bank has provided preliminary terms for financing the project. Our interest remains subject to full credit underwriting by NBT's credit department and approval from NBT's loan committee. Based on the company's track record and financial strength, I have a high degree of confidence that NBT's loan committee will approve the loan request and provide a commitment to finance the project.

Please do not hesitate to contact me if you have further questions.

Respectfully,

A handwritten signature in black ink, appearing to read "Kimberly I. Twitchell".

Kimberly Twitchell
Regional President
NBT Bank

GENERAL APPLICATION DOCUMENT

ZONING ASSESSMENT

See attached Zoning Assessment Table and project site plans for additional information.


ZONING ANALYSIS Relevant Zone(s) B-5b and Waterfront TIF District
All Projects:

	Required	Proposed
Lot Size	None	8.4 AC
Area Per Dwelling Unit		
Minimum Street Frontage		
Front Yard Minimum Setback		
Front Yard Maximum		
Rear Yard	10 FT	8.9 FT
Yard Right	NONE	123 FT
Yard Left	NONE	5 FT
Side Street Setback		
Step Back		
Maximum Lot Coverage	100%	<60%
Minimum Lot Coverage		
Maximum Height	55 FT	
Open Space		
Maximum Impervious Area		
Pavement Setback		
Floor Area Ratio		
Off Street Parking Spaces		
Loading Bays	155	540
Other 1		
Other 2		
Other 3		

NOT APPLICABLE

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		

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):			

GENERAL APPLICATION DOCUMENT

WAIVER REQUESTS

The Accompanying Waiver Table provides a description of the applicable waiver requests and supporting evidence for these requests.

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’.	Justification for Waiver: Address specific waiver criteria, if applicable, and document reasons for the waiver request.
<i>Technical Standard – Transportation Standards – Number of Driveways 1.7.2.8</i>	<i>No more than two (2) driveways shall be permitted for ingress and egress purposes to any commercial, industrial or residential (with 10 or more parking spaces) site.</i>	We are requesting three site driveways along West Commercial Street due to the site conditions including length/street frontage and proposed driveway separation.	The site conditions include narrow lot depth that restrict ease of onsite circulation. The staff parking lot requires a driveway connection as it is separate by distance to the parking garage. The parking garage is proposed to have two entrances (one on each end of the building) and the lot depth doesn't allow for easy connectivity and consolidation of these access conditions.
<i>Technical Standards – Transportation Standards – Bicycle Parking (14-526 (a) 4 b)</i>	<i>(b) Non-residential structures. Two (2) bicycle parking spaces for every ten (10) vehicle parking spaces for the first one hundred (100) required vehicle parking spaces, plus one (1) bicycle parking space for every twenty (20) required motor vehicle parking space over one hundred (100) required vehicle parking spaces.</i>	The applicant is requesting a waiver of the required number of bicycle parking spaces as that would exceed well over 50 bike spaces which is considered excessive for the clinic use.	The proposed development is expected to generate a reduced demand for bicycle parking due to the services provided.

SITE DESIGN

The following statements are provided in accordance with the submission and Section 14-526 of the ordinance.

(d) Site Design Standards.

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*

1. *Massing, Ventilation and Wind Impact:*

- a. The project proposes construction of a new two-story VA Clinic building and a 3 level parking garage. The project will not result in any significant changes to the wind environment proximate to the site. There are no abutting structures or uses that might be impacted by the proposed buildings, as the site is somewhat isolated from nearby neighborhoods.
- b. The project will not result in any significant impacts to abutting properties and is consistent with the B-5b zone and other zoning/city standard considerations. The proposed Clinic and parking garage will be lower than the allowable building height in the zone and their unique positioning at the base of the West end bluff off Danforth Street overlooking the waterfront, will minimize any visual impacts to the residential areas nearby as well as fitting in well with the gateway that West Commercial Street provides.
- c. HVAC venting, if necessary, will be directed through building roof top mounted units and will not impact any adjacent public spaces or residential properties.

Shadows (14-526 (d) 2), if applicable

- Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
- #### 2. *Shadows:*
- a. The buildings at the site will not cast significant shadows onto neighboring properties, or block access to direct sunlight for structures utilizing solar energy. The Site Layout Plan and Grading and Drainage Plan show the proposed site improvements and their relationships to property lines. The grading plan shows the relative elevations of the building with respect to elevations along the property lines.

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.*

3. *Snow and Ice Loading:*

- a. The buildings have been designed and located such that accumulated snow and ice will not fall onto adjacent properties or public ways. Snow will be removed from the parking lots and stockpiled within the site perimeter or if necessary removed from the site.

View Corridors (14-526 (d) 4), if applicable

- *Protection of designated view corridors (Portland Design Manual, Appendix 1)*

4. *View Corridors:*

- a. The project entails construction of a two-story building and three level parking garage in manner that is compliant with the B-5b Zone. The site is considered a primary gateway entrance into the Old Port and the building will provide a great opportunity to enliven and bring increased vibrancy to this end of Commercial Street. The site does not block views from nearby properties. The site is not located within any corridors identified in the Downtown Vision View Corridor Protection Plan. The Boat Yard construction on the opposite side of the street introduces similarly sized buildings to the area.

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*

5. *Historic Resources:*

- a. The development is not located in a historic district, historic landscape district or City designated landmark.
- b. The development is not located adjacent to or within 100 feet of a designated landmark, historic district, or historic landscape district.
- c. There are no known remaining archaeological resources on the site.

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)*

6. *Exterior Lighting:*

a. *Site Lighting*

- (i) All new exterior lighting at the site will be full cutoff with no light emitted above the horizontal plane, and in accordance with Section 12 of the Technical Manual. A photometric Lighting Plan has been prepared by Swaney Lighting Consultants to demonstrate illumination levels throughout

the site will be consistent with City Standards. A copy of the cut sheets are included at the end of this section.

b. Architectural and Specialty Lighting

- (i) Not applicable to the project.

c. Street Lighting

- (i) There are existing area lights along drives West Commercial Street. Additional Trail/Waterfront lighting will be positioned along the new 10' pathway in accordance with the Technical Manual.

Noise and Vibration (14-526 (d) 7)

- *Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements*

7. Noise and Vibration:

All heating, ventilation, air conditioning equipment including air handlers and generators are designed to meet local, state, and federal emissions and noise requirements. Most of the HVAC equipment is mounted in the middle of the roofs to minimize visibility. Any additional ground mounted equipment for the buildings will be screened. Equipment cut sheets can be provided upon request.

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*

8. Signage and Wayfinding:

- a. All street and wayfinding signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code.
 - (i) The project is not located in a historic district or subject to Article IX.
 - (ii) Proposed wayfinding signage is identified in the Site plan.
 - (iii) All street and wayfinding signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code.

Zone Related Design Standards (14-526 (d) 9)

- 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

9. *Zoning Related Design Standards:*

In accordance with part (c) of the Design Manual the following evidence of compliance is provided for each of the standards:

(c) B-5 and B5_b Urban Commercial Business Zones

(1) Standards

- a. Shared Infrastructure – the development site does not specifically benefit from any substantial adjacent development given the site size and configuration, thus the opportunity to share infrastructure is limited. The objective of the parking garage positioning is to allow for shared use between the Clinic and tenants of the Star Match Building to the east. In fact, an additional parking deck is included in the design to allow for that shared parking capacity between the properties. The site development program is configured with three driveways that will also allow for shared use between the clinic and the parking garage, although shared vehicular access is not contemplated at this time.
- b. The proposed buildings are positioned to comply with the maximum 10 foot building setback requirement from the street line thus satisfying this standard for proximity to the street.
- c. The Clinic orientation prominently places the entry locations at the front of the building along with prominent window facades that will clearly communicate the VA mission and identify to the public. Tower elements on both the Clinic and garage building anchor and link each building and their entries to each other as well as to the street.
- d. The surface parking lot for VA Clinic staff is located to the side of the building primarily due to the topographic limitations of the property. The parking garage is located in a manner to allow shared capacity with the Star Match Building to the east.

JOB _____

TYPE _____

NOTES _____

APPROVALS _____

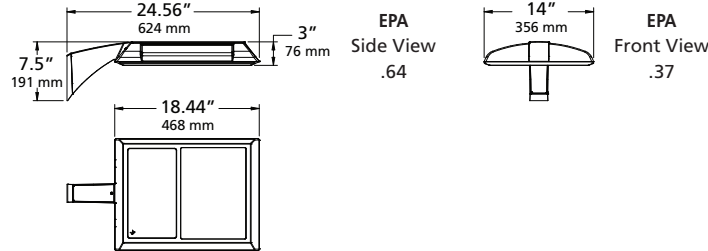
FEATURES

- Elegant form factor
- High performance optics provide up to 17,500 delivered lumens
- Diffusion lens for low glare comfort
- NX™ wireless control options
- IP66

CERTIFICATIONS



SPECIFICATIONS



Weight: 21.5 lbs / 9.75 kg

ORDERING CODE

Series	LED Engine	CCT	Distribution	Rotation	Voltage	Mounting
ALT1 Altitude	No Lens	AM Amber	FR Type I/Front Row	Blank for no rotation	UNV 120-277V	ASQ Arm Square pole
	28L-20 3,000 lm	3K7 3000K, 70 CRI	2 Type II	L ¹ Optic rotation left	347 347V	A34 Arm mt 3.3-4.2" OD pole
	28L-40 5,000 lm	4K7 4000K, 70 CRI	3 Type III	R ¹ Optic rotation right	480 480V	A46 Arm mt 4.5-6.0" OD pole
	28L-60 7,500 lm	5K7 5000K, 70 CRI	4 Type IV			MAF Horizontal Slipfitter 2 3/8" OD arm
	28L-85 10,000 lm	3K8 3000K, 80 CRI	4W Type IV Wide			SVSF Vertical Slipfitter Mount square for 2" pipe tenon, (2-3/8" O.D.)
	54L-95 12,500 lm	4K8 4000K, 80 CRI	5QM Type V Square Medium			VSF Vertical Slipfitter Mount for 2" pipe tenon, (2-3/8" O.D.)
	54L-120 15,000 lm	3K9 3000K, 90 CRI	5QN Type V Square Narrow			WB Wall Bracket for area wall mount
	54L-155 17,500 lm		5R Type V Rectangular			
			5W Type V Wide (Round)			

Fixture Finish	Control Options	Options	Control Accessories
BL Black	7PR 7 pin PCR, wireless control enabled	BC ⁵ Backlight Control	SCPREMOTE Remote control for SCP option. Order at least one per project to program and control the occupancy sensor
DB Dark Bronze	7PR-TL 7 pin PCR with twist lock photocontrol	SF Single Fuse	SW7PR SiteSync™ on fixture module via 7PR
GT Graphite	7PR-SC 7 pin PCR with shorting cap	DF Double Fuse	SWUSB SiteSync™ Software on USB
LG Light Gray	AD-01 ² AstroDIM: 50% output at midnight	TB Terminal Block	SWTAB SiteSync™ Windows Tablet
PS Platinum Silver	AD-02 ² AstroDIM: 50% output midnight to 4 AM	CLR Clear Lens	SWBRG SiteSync™ Wireless Bridge Node
TT Titanium	AD-03 ² AstroDIM: 50% output 10PM	HDL ⁶ Diffuse Lens	SWFC SiteSync™ Field Commission Service
WH White	AD-04 ² AstroDIM: 50% output 10PM to 4AM		WIR-RME-L wiSCAPE™ External Fixture Module
CC Custom Color [†]	NXSP14F ^{2,3} Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14'		NXOFM-1R1D-UNV NX External Control Node
†Consult factory	NXSP30F ^{2,3} Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'		
	NXSPW14F ^{2,3} NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14'		
	NXSPW30F ^{2,3} NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30'		
	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 programmable line voltage sensor, use with SCPREMOTE		
	SCP-40F Remote control programmable line voltage sensor, use with SCPREMOTE		
	SWP ^{2,3,4} Site Sync™ Pre Commission Wireless Module		
	SWPM-40F ^{2,3,4} Site Sync with Sensor 9' to 40' MH		

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 and 5W distributions.
- 2 Not available with other sensor or wireless control options.
- 3 Not available in 480V.
- 4 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.
- 5 Not available with Type 5 distributions, CLR, or HDL option.
- 6 Only available in Type 3 or Type 5W

Kim Lighting reserves the right to change specifications without notice.

LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	3,000	20	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	5,000	40	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
			HDL Lens	5W	4430	3	0	1	117	4663	3	0	1	123	4725	3	0	1	124
				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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	7,500	60	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	10,000	85	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	
54	12,500	95	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
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4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	
54	15,000	120	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	2	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	
54	17,500	155	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	1	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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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

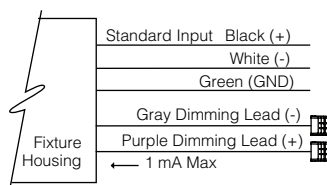
- Standard programmable driver allows for programmable drive current settings.
- Electrical components are strategically located in the driver gear compartment with a molded silicon grommet seal to provide separation from the optical chamber.
- Maximum lightning surge current 20KA with thermally protected 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 (350mA to 700mA).

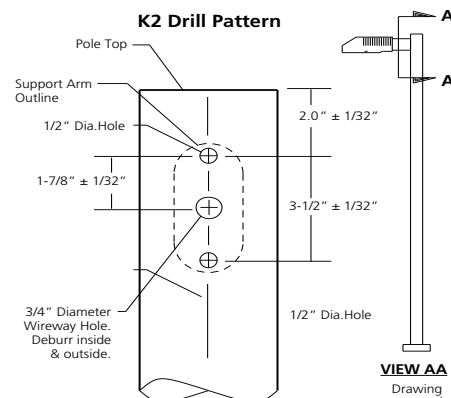
Dimming:

- 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.



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.

Fusing:

SF for 120, 277, and 347 Line volts

DF for 208, 240, and 480 Line volts

High 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 (BL) Black, (DB) Dark Bronze, (GT) Graphite, (PS) Platinum Silver, (LG) Light Gray, (TT) Titanium, (WH) White, and (CC) Custom Color (Include RAL#).

Certifications and Listings:

- UL 1598 Standard for Luminaires.
- UL 8750 Standard for Safety for Light.
- ANSI C136.31-2010 3G Vibration tested and compliant.
- IDA approved, 3000K and warmer CCTs only
- IP66 Certified

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.hubbellighting.com/resources/warranty>

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CONTROLS

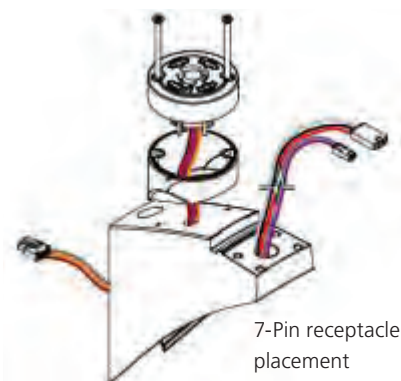
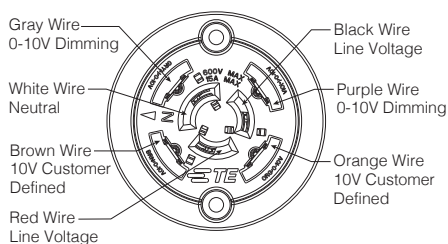
Photocell Receptacle

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.



High mode: 10V - Low mode: 1V - Ramp-up rate: disabled - Fade-down rate: disabled - Photocell: Off - Sensitivity: Full - Time Delay: Fade to low: 5 minutes - Time Delay: Fade to off: 1 hour

- The SCP enables any wall mounted luminaire, in excess of 75 watts, to meet California Title 24 requirements with integral 10KA surge protection for added reliability and serviceability. For more detail: http://www.aal.net/products/sensor_control_programmable

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.

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.

Wireless Controls

- Optional universal voltage (120-277V) for dusk to dawn energy savings. Photocontrol is factory installed inside the housing with a fully gasketed sensor on the side wall. For multiple fixture mountings, one fixture is supplied with a photocell to operate the others.
- Occupancy Sensor shall be programmable and use passive infrared (PIR) sensing technology that reacts to changes in infrared energy (moving body heat) within the coverage area. Careful consideration must be given to obstructions that may block the sensor's line of sight.
- Factory default settings for SCP option shall be:-

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¹PRECOMMISSIONED 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.

²Voltage, ³Color, ⁴Pole Diameter,

JOB _____ TYPE _____

NOTES _____ APPROVALS _____

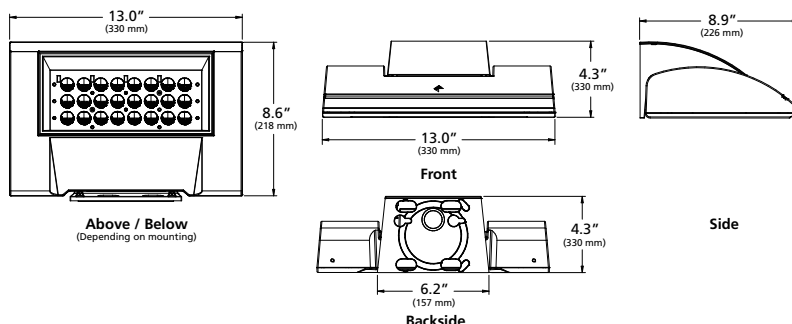
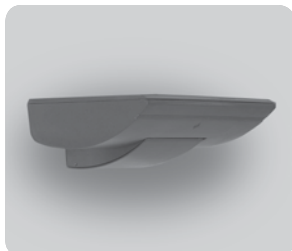
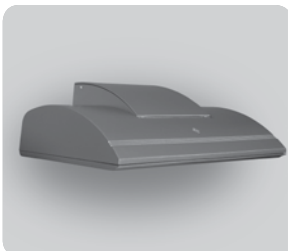
FEATURES

- -5° to +10° tilt adjustment
- High performance optics deliver up to 8,500 lumens
- up or down mountable without modification
- Diffused lens option
- Programmable occupancy sensor (dimming)
- NX and SiteSync wireless controls
- Up to 130 lumens per watt

Certifications



SPECIFICATIONS



Weight: 20 lbs

ORDERING CODE

Fixture	Mounting	Source	Wattage	Light Engine	Distribution	Voltage
WDS Wall Director Small	D Down U ¹ Up	24L 24 LEDs	30 30 Watts 40 40 Watts 60 60 Watts 75 75 Watts	3K7 3000K/70CRI 3K8 3000K/80CRI 4K7 4000K/70CRI 4K8 4000K/80CRI 5K7 5000K/70CRI	1 Type I 2 Type II 3 Type III 4W Type IV Wide 4F Type IV Forward WG ² Wall Graze SP Spot/Column FTD ² Forward Throw Diffuse WTD ² Wide Throw Diffuse	UNV 120-277V 347 ³ 347V 480 ³ 480V
Fixture Finish	Control Options	Options	Accessories			
BLS Black Gloss Smooth BLT Black Matte Textured DBS Dark Bronze Gloss Smooth GTT Graphite Matte Textured LGS Light Grey Gloss Smooth PSS Platinum Silver Smooth VGS Verde Green Smooth WHS White Gloss Smooth CC Custom Color [†]	PC Button Photocell SCP-8F ⁴ Programmable Occ. Sensor (<9' height) SCP-20F ⁴ Programmable Occ. Sensor (9' - 20' height) SWP ⁵ SiteSync Wireless Pre-Commission NXWE ⁶ NX Wireless Enabled	EM ⁵ Internal Emergency Battery Backup SF Single Fuse & Fuse holder DF Double Fuse & Fuse holder	SCPREMOTE SCP configuration tool SWUSB SiteSync Software on USB SWTAB SiteSync Windows® Tablet SWBRG SiteSync Software Bridge Node			

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INTELLIGENCE

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¹ Not available with EM option or with SCP & SWPM sensor options.
² WG, FTD, and WTD come with a diffused lens.
³ 60 and 75 watt versions only
⁴ SCP and EM are not compatible
⁵ Universal voltage only (120-277), not available with PC option.
⁶ 120-347V only

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	29	Clear Lens	1	3433	1	0	0	119	3519	1	0	0	122	3560	1	0	0	123
				2	3351	1	0	1	116	3436	1	0	1	119	3475	1	0	1	120
				3	3340	1	0	1	116	3424	1	0	1	119	3463	1	0	1	120
				4F	3343	1	0	1	116	3427	1	0	1	119	3466	1	0	1	120
				4W	3172	1	0	1	110	3252	1	0	1	113	3289	1	0	1	114
				SP	3600	3	0	0	125	3691	3	0	0	128	3733	3	0	0	129
			Diffuse Lens	WG	3372	2	0	1	117	3456	2	0	1	120	3496	2	0	1	121
				FTD	2855	1	0	1	99	2927	1	0	1	101	2960	1	0	1	103
				WTD	3151	1	0	1	109	3230	1	0	1	112	3267	1	0	1	113
	4,500	42	Clear Lens	1	4593	1	0	0	111	4708	1	0	0	113	4762	1	0	0	115
				2	4484	1	0	1	108	4596	1	0	1	111	4649	1	0	1	112
				3	4468	1	0	1	108	4581	1	0	1	110	4633	1	0	1	112
				4F	4472	1	0	1	108	4585	1	0	1	110	4637	1	0	1	112
				4W	4244	1	0	1	102	4350	1	0	1	105	4400	1	0	1	106
				SP	4817	3	0	0	116	4938	3	0	0	119	4994	3	0	0	120
			Diffuse Lens	WG	4511	2	0	1	109	4624	2	0	1	111	4677	2	0	1	113
				FTD	3819	1	0	1	92	3915	1	0	1	94	3960	1	0	1	95
				WTD	4215	1	0	1	102	4321	1	0	1	104	4371	1	0	1	105
	6,000	59	Clear Lens	1	6333	1	0	1	108	6492	1	0	1	111	6566	1	0	1	112
				2	6182	1	0	1	106	6338	1	0	1	108	6410	1	0	1	110
				3	6161	1	0	2	105	6316	1	0	2	108	6388	1	0	2	109
				4F	6166	1	0	2	105	6321	1	0	2	108	6393	1	0	2	109
				4W	5851	1	0	2	100	5998	1	0	2	103	6067	1	0	2	104
				SP	6641	4	0	0	114	6808	4	0	0	116	6886	4	0	0	118
			Diffuse Lens	WG	6219	3	0	1	106	6376	3	0	1	109	6449	3	0	1	110
				FTD	5266	1	0	1	90	5398	2	0	1	92	5460	2	0	1	93
				WTD	5812	1	0	1	99	5958	1	0	1	102	6026	1	0	1	103
	7,500	74	Clear Lens	1	7879	1	0	1	106	8077	1	0	1	109	8170	1	0	1	110
				2	7692	1	0	1	104	7885	1	0	1	107	7975	1	0	2	108
				3	7665	1	0	2	104	7858	1	0	2	106	7948	1	0	2	107
				4F	7672	1	0	2	104	7865	1	0	2	106	7955	1	0	2	107
				4W	7280	1	0	2	98	7463	1	0	2	101	7548	1	0	2	102
				SP	8263	4	0	0	112	8471	4	0	0	114	8567	4	0	0	116
			Diffuse Lens	WG	7738	3	0	1	105	7933	3	0	1	107	8023	3	0	1	108
				FTD	6552	2	0	1	89	6717	2	0	1	91	6793	2	0	2	92
				WTD	7231	2	0	1	98	7413	2	0	1	100	7498	2	0	1	101

Electrical Characteristics											Dimming					
System Watts	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
29	350mA	120-480	50/60	0.24	0.14	0.12	0.10	0.08	0.06	>0.9	20	10% to 100%	0mA	1mA	0V	10V
42	500mA			0.38	0.22	0.19	0.16	0.13	0.09							
59	725mA			0.48	0.27	0.24	0.21	0.16	0.12							
74	925mA			0.67	0.39	0.34	0.29	0.23	0.17							

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%	86%	> 60,000 hrs

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SPECIFICATIONS

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.

Optical Array

- LEDs shall be mounted to a metal printed circuit board assembly (MCPCB).
- Optical lenses shall be clear injection molded PMMA acrylic.
- Secondary lens is impact resistant 1/8" tempered glass with anti-reflective coating.

Electronic Module

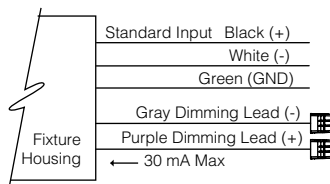
- Drivers shall be in direct contact with the die-cast aluminum lens frame across the entire surface area of the widest face for maximum thermal transfer.
- "Thermal Shield", secondary side, thermistor provides protection for the sustainable life of LED module and electronic components.
- Drivers shall 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
- Luminaires shall have integral surge protection that shall be U.L. recognized and have a surge current rating of 10,000 Amps using the industry standard 8/20uSec wave and surge rating of

372J. Surge protection device shall be wired in series.

- Drivers shall be U.L. recognized.
- Drivers shall not be compatible with current sourcing dimmers, consult factory for current list of known compatible dimming systems approved dimmers include Lutron Diva AVTV, Lutron Nova NFTV and NTFTV.

Dimming

- 10% to 100% dimming by the use of standard 0-10V interface driver.
- The thermal shield works in conjunction with the control system to assure that overheating will not harm the LEDs.
- The wiring harness is connected with the use of the Purple lead as the positive (+) and the Grey lead as the negative (-) to an available control signal (by others).



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.

Controls

- Optional universal voltage (120-277V) button photocontrol for dusk to dawn energy savings. Photocontrol is factory installed inside the housing with a fully gasketed sensor on the side wall. For multiple fixture mountings, one fixture is supplied with a photocell to operate the others.
- Occupancy Sensor shall be programmable and use passive infrared (PIR) sensing technology that reacts to changes in infrared energy (moving body heat) within the coverage area. Careful consideration must be given to obstructions that may block the sensor's line of sight.
- Factory default settings for SCP option shall be:
- High mode: 10V - Low mode: 1V - Ramp-up

rate: disabled - Fade-down rate: disabled - Photocell: Off - Sensitivity: Full - Time Delay: Fade to low: 5 minutes - Time Delay: Fade to off: 1 hour

- The SCP enables any wall mounted luminaire, in excess of 30 watts, to meet California Title 24 requirements with integral 10KA surge protection for added reliability and serviceability. For more detail: http://www.aal.net/products/sensor_control_programmable
- SiteSync™ wireless control system for reduction in energy and maintenance cost while optimizing light quality 24/7. See ordering information or visit www.hubbellighting.com/products/sitesync for more details.
- 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

Options

- Integral battery backup provides emergency path of egress lighting for the required 90 minutes for 0°C ambient environments or -20°C with thermal jacket.

- Fusing:

SF for 120, 277 and 347 Line Volts

DF for 208, 240 and 480 Line Volts

High temperature fuse holders factory installed inside the fixture housing. Fuse is included.

Mounting and Installation

- JUNCTION BOX(By Others): Standard with steel, quick-mount junction box plate that mounts directly to 4" J-Box
- Mounting plate is stainless steel and features a one-piece EPDM gasket on back side of plate to firmly seal fixture to wall surface, forbidding entry of moisture and particulates.

Servicing

- Housing shall be able to hang freely in an open service position for inspection of primary wire connections. Once in service position, the housing shall be able to be removed for service by sliding the assembly to the left (for down mounting) or to the right (for up mounting) and disconnecting the wiring plugs.

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SPECIFICATIONS

- Driver assembly shall be mounted to a prewired internal tray with quick disconnects for removal. Fusing SF for 120, 277, and 347 line volts DF for 208, 240, and 480 line volts high temperature fuse holders factory installed inside the fixture housing. Fuse is included.

Finish:

- Luminaire finish shall consist of a five stage pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish.
- Luminaire finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance.
- Standard colors include (BL) Black, (DB) Dark Bronze, (GT) Graphite, (LG) Light Gray, (PS) Platinum Silver, (TT) Titanium, (WH) White, and (CC) Custom Color (Include RAL#).

Certifications and Listings

- UL1598, UL 8750 and Canadian CSA Std. C22.2 no.250.
- IDA approved, down light only, 3000K and warmer CCTs only.
- 1.5G rated
- IP66 Compliant
- IK08 Certified

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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BeveLED Block® Surface - BLSD5 Square Downlight

SURFACE MOUNT



usailighting.com/block

CONDUIT CUT OUT



Keep ceiling height right where it is! Specifically designed to work with surface-mounted conduit and junction boxes, BeveLED BLOCK has a modern look that's perfect for lofts, offices, and open architectural spaces. Also available with solid-sides styling shown above, Block also creates a finished look when recessed conduit is possible.

FEATURES

- High performance architectural lighting solution for industrial or exposed concrete ceiling types where recessed lighting is not an option
- Convenient conduit cutouts provide access for surface-mounted conduit to pass through the luminaire
- Smooth, modular solid and keyhole slots are interchangeable and user configurable to allow for simple on site customization in the field.
- BeveLED BLOCK is available in a range of standard and custom colors to complement your project, whether an industrial or refined look is desired.
- Industry leading illumination and craftsmanship

BEVELED BLOCK DOWNLIGHT PERFORMANCE DATA

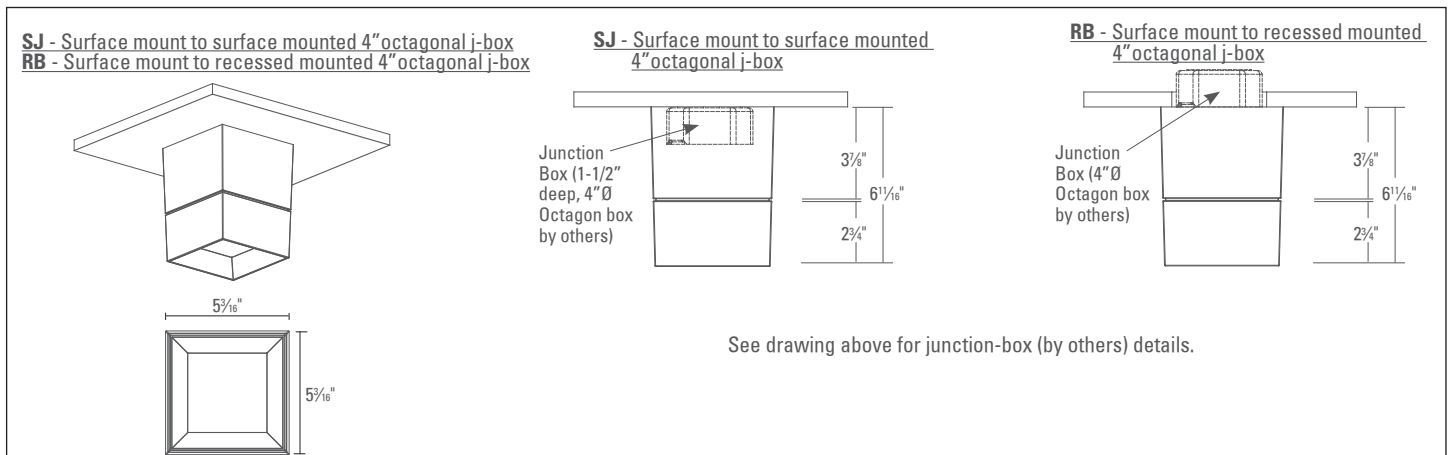
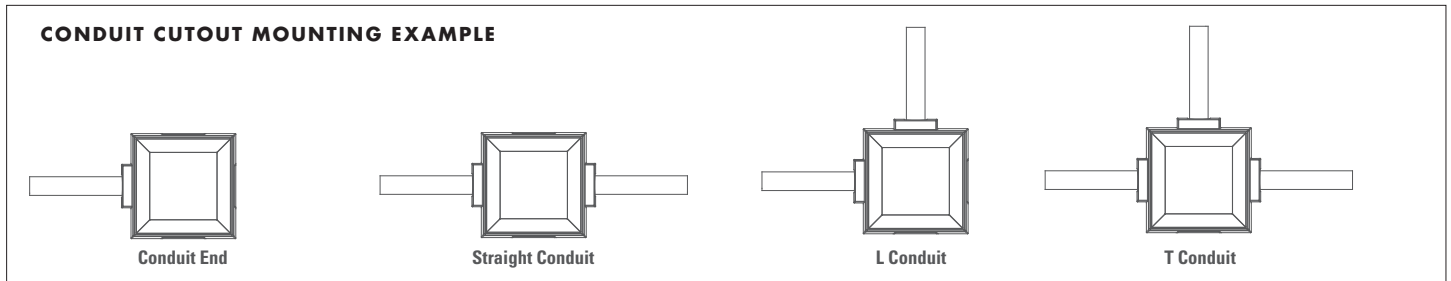
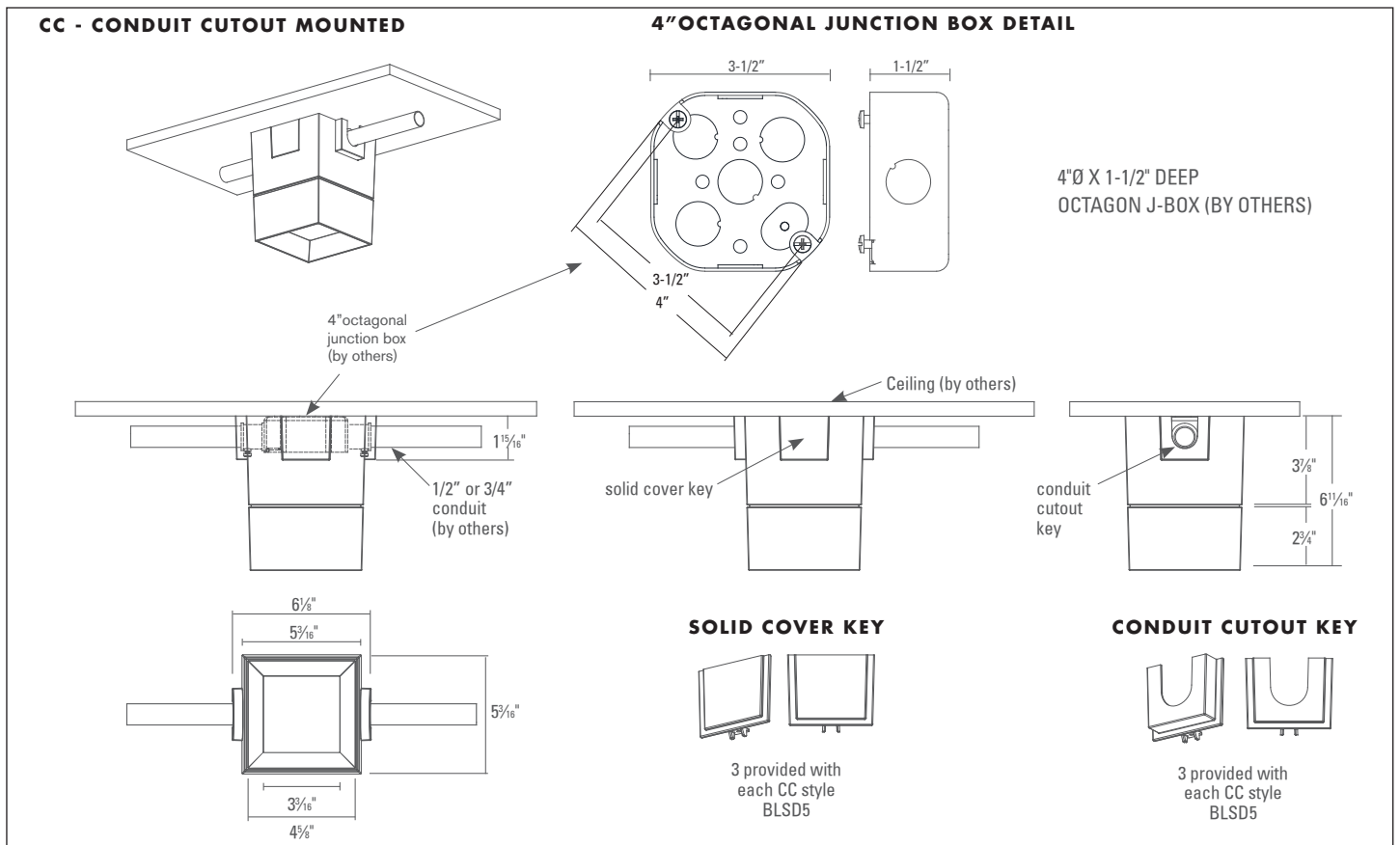
LED COLOR CHOICES

DELIVERED* PERFORMANCE:	Classic White								Warm Glow Dimming	
	9W		12W		16W		24W		16W	
Coloring Rendering Index:	80+	90+	80+	90+	80+	90+	80+	90+	80+	90+
Source Lumens:	1150	900	1300	1025	1725	1350	2400	1875	1275	1025
Lumens Per Watt:	100	74	93	73	93	72	86	67	69	55
Delivered Lumens:	850	675	1125	875	1475	1150	2050	1600	1100	875

*Performance based on 3000K. See IES files for exact values at usailighting.com.

CORRELATED COLOR TEMPERATURE	Classic White										Warm Glow Dimming				
	2200K		2700K		3000K		3500K		4000K		2700K		3000K		3500K
Coloring Rendering Index:	80+	80+	90+	80+	90+	80+	90+	80+	90+	80+	90+	80+	90+	80+	80+
Multiplier for Lumen Output:	0.72	0.94	0.78	1.00	0.78	1.00	1.00	1.06	1.06	0.94	0.79	1.00	0.81	1.00	1.00

BeveLED Block® Surface - BLSD5 Square Downlight



BeveLED Block® Surface - BLSD5

Square Downlight with Integral Driver

FAMILY		LED COLOR CHOICES			FIXTURE				
BLSD5									
BeveLED Block Downlight		Wattage Options	LED Color Temperature Options	Beam Options	Lens Options	Body Finish Options	Mounting Options	Voltage Options	Dimming Driver Options
BLSD5 BeveLED BLOCK 5" Square Downlight	Classic White			S Solite (provided standard) BF Borosilicate Frosted	WH White BZ Statuary Bronze BL Black GR Metalized Grey SC Conduit Silver RAL Custom Color (specify RAL #)	CC Conduit cutout for surface mounted 4" octagonal junction box SJ Surface mounted to surface mounted 4" octagonal junction box	For use with CC and SJ Mounting		
	09C3 9W LED 12C3 12W LED 16C3 16W LED 24C3 24W LED	22KS 2200K, 80+ CRI 27KS 2700K, 80+ CRI 27KH 2700K, 90+ CRI 30KS 3000K, 80+ CRI 30KH 3000K, 90+ CRI 35KS 3500K, 80+ CR 35KH 3500K, 90+ CRI 40KS 4000K, 80+ CR 40KH 4000K, 90+ CRI	25 25° beam 50 50° beam 90 90° beam				UNV 120V-277V	For use with Universal Voltage 120V - 277V D2 0-10V dim, 10% (provided standard)	
	Warm Glow Dimming					RB Surface mounted to recessed mounted 4" octagonal junction box	For use with RB Mounting Only		
	16WG2 16W LED	2722KS - 2700K-2200K, 80+ CRI 2722KH - 2700K-2200K, 90+ CRI 3022KS - 3000K-2200K, 80+ CRI 3022KH - 3000K-2200K, 90+ CRI 3522KS - 3500K-2200K, 80+ CRI	30 30° beam 50 50° beam 90 90° beam				UNV 120V-277V	For use with Universal Voltage 120V - 277V D2 0-10V dim, 10% (provided standard) D4A Lutron ECO, 0.1% (2, 3, 4) D4E Lutron 5 ECO, 5% (1, 2, 3) D4H Lutron H ECO, 1% Fade (1, 2, 3) D4P Lutron ECO, 1% (2, 4) D6A EldoLED 0-10V, 0.1% (2) D6B EldoLED 0-10V, 0.1% (2) D6E EldoLED 0-10V, 1% (2) D6F EldoLED 0-10V, 1% (2) D7 EldoLED DALI, 0.1% (2)	
							120V	For use with 120V only D3 Lutron Hi-Lume 1% 2-wire, 120V only (2) D19 Phase dimming 1%, 120V only (1, 3) 1 Not available with 9W 2 For use with RB mounting only 3 Not available for Warm Glow 4 Not available with 24W	

BeveLED Block® Surface - BLSD5

Square Downlight with Remote Driver

FAMILY		LED COLOR CHOICES		FIXTURE				
BLSD5							RM	
BeveLED Block Downlight		Wattage Options	LED Color Temperature Options	Beam Options	Lens Options	Body Finish Options	Mounting Options	Remote Power Supply
BLSD5 BeveLED BLOCK 5" Square Downlight	 Classic White			S Solite (provided standard) BF Borosilicate Frosted	WH White BZ Statuary Bronze BL Black GR Metalized Grey SC Conduit Silver RAL Custom Color (specify RAL #)	CC Conduit cutout for surface mounted 4" octagonal junction box SJ Surface mounted to surface mounted 4" octagonal junction box RB Surface mounted to recessed mounted 4" octagonal junction box	RM Remote Power Supply (Specify in table below)	
	09C3 9W LED 12C3 12W LED 16C3 16W LED 24C3 24W LED	22KS 2200K, 80+ CRI 27KS 2700K, 80+ CRI 27KH 2700K, 90+ CRI 30KS 3000K, 80+ CRI 30KH 3000K, 90+ CRI 35KS 3500K, 80+ CR 35KH 3500K, 90+ CRI 40KS 4000K, 80+ CR 40KH 4000K, 90+ CRI	25 25° beam 50 50° beam 90 90° beam					
	 Warm Glow Dimming							
	16WG2 16W LED	2722KS - 2700K-2200K, 80+ CRI 2722KH - 2700K-2200K, 90+ CRI 3022KS - 3000K-2200K, 80+ CRI 3022KH - 3000K-2200K, 90+ CRI 3522KS - 3500K-2200K, 80+ CRI	30 30° beam 50 50° beam 90 90° beam					

2. Specify Remote Power Supply

2. Specify Remote Power Supply

RPC-01				
Remote Power Supply	Wattage Options	Voltage	Remote Dimming Type and Level	Remote Emergency Option
RPC-01 BeveLED Block Remote Power Supply	 Classic White	UNV 120V - 277V	D4A Lutron ECO, 0.1% (2, 3) D4E Lutron 5 ECO, 5% (1, 2) D4H Lutron H ECO, 1% Fade (1, 2) D4P Lutron ECO, 1% (3) D6A EldoLED 0-10V, 0.1% D6B EldoLED 0-10V, 0.1% D6E EldoLED 0-10V, 1% D6F EldoLED 0-10V, 1% D7 EldoLED DALI, 0.1% D18 Moon's DMX, 0.1% (2)	EM5 EM battery requires remote enclosure by others, minimum size 11" L x 6.75" W x 3.25" H
	 Warm Glow			
	16WG2 16W LED	120V 120V Only	D3 Lutron 2-wire, 1% D19 Hatch Phase 2-wire, 1% (1, 2)	
			1 Not available for 9W 2 Not available for Warm Glow 3 Not available for 24W	

BeveLED Block® Surface - BLSD5

Square Downlight



KEY ACCESSORIES

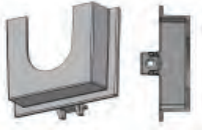
CONDUIT CUTOUT KEYS

Each conduit cutout canopy pendant is provided with three conduit cutout keys (KAS-CC-XX) and three solid cover keys (KAS-VK-XX) in the fixture finish specified. For more keys, or for extended length keys, please use the ordering table below.

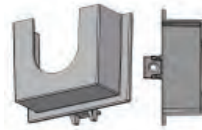
KEY ACCESSORY ORDERING INFORMATION

Fixture Family	Key Accessory	Finish
KAS Key Accessory Square	CC* Conduit Cutout Key XC Conduit Cutout Key, Extended Length VK* Solid Cover Key	WH White SC Conduit Silver GR Grey BL Black BZ Bronze RAL Custom Color
	*3 provided with each conduit cutout canopy	

SQUARE CANOPY CUTOUT KEY (STANDARD) KAS-CC



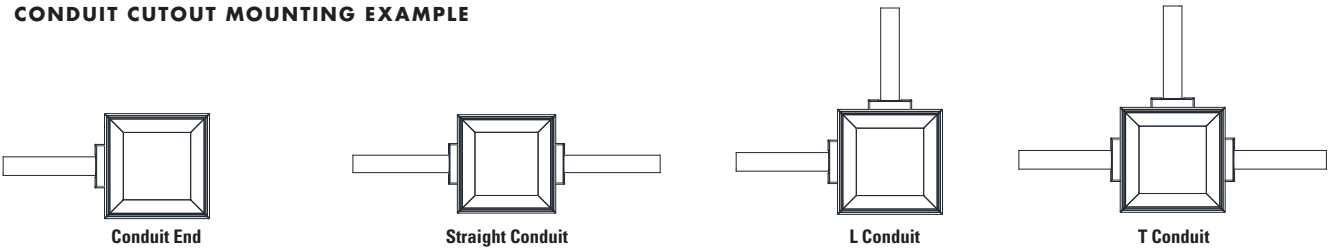
SQUARE CANOPY CUTOUT KEY EXTENDED DEPTH KAS-XC



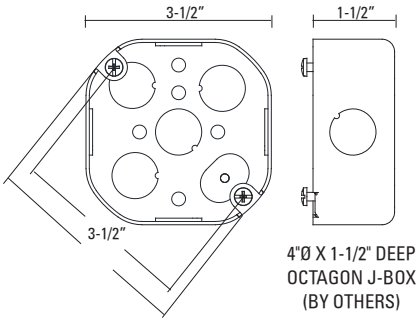
SQUARE SOLID COVER KEY (STANDARD) KAS-VK



CONDUIT CUTOUT MOUNTING EXAMPLE



4" OCTAGONAL JUNCTION BOX DETAIL



BeveLED Block® Surface - BLSD5

Square Downlight

BEVELED BLOCK SPECIFICATIONS

FIELD REPLACEABLE LED LIGHT ENGINE

is serviceable without tools. All USAI Lighting Classic White and Warm Glow Dimming light engines feature industry-leading color consistency

FIELD REPLACEABLE DRIVER

0-10V, 100%-10% solid state electronic constant current D2 dimming driver with a high power factor provided standard and sources 2mA. Other dimming drivers optionally available. D6 dimming drivers source 2mA. Driver complies with IEEE C62.41 surge protection. Some on-time delay may be experienced depending on control system used.

REMOTE LOCATION DRIVER

If a remote dimming driver is required, specify "RM" in the fixture part number and proceed to the RP table to complete the dimming driver specification. All remote power supplies must be clearly specified in the "RP" table, with one remote power supply required per fixture. Remote power supplies require enclosures by others that meet local codes and must be located in an accessible service panel within 100ft of the light fixture; see table below for coordination of enclosure sizes. All dimming drivers comply with IEEE C62.41 surge protection.

REMOTE LOCATION EMERGENCY

Remote emergency battery IOTA ILB-CP05 provides 5W to one fixture for 90 minutes. Remote power supplies with EM option require an enclosure by others with minimum size of 11"L x 6.75"W x 3.25"H that meets local codes. Emergency battery remote power supplies cannot be located any more than 50 feet from light fixture.

BEVELED BLOCK REMOTE POWER SUPPLY REQUIREMENTS AND WIRING DIAGRAM

			Minimum Enclosure Size Required (by others)		
Remote Power Supply Dimming Option		Wire Gauge Required*	RP Only	RP with EM Option**	
RPC-01-09C3 RPC-01-12C3 RPC-01-16C3 RPC-01-24C3 RPC-01-16WG2	UNV-D4A	Lutron ECO, 0.1% (2, 3)	14/12	6.25" L x 4" W x 2" H	11" L x 6.75" W x 3.25" H
	UNV-D4E	Lutron 5 ECO, 5% (1, 2)			
	UNV-D4H	Lutron H ECO, 1% fade (1, 2)			
	UNV-D4P	Lutron ECO, 1% (3)			
	UNV-D6A	EldoLED 0-10V, 0.1%	18/16	9" L x 4" W x 2" H	
	UNV-D6B	EldoLED 0-10V, 0.1%			
	UNV-D6E	EldoLED 0-10V, 1%			
	UNV-D6F	EldoLED 0-10V, 1%			
	UNV-D7	EldoLED DALI, 0%	14/12	5.75" L X 2.625" W X 2" H	
	UNV-D18	Moon's DMX 0.1% (2)			
120V-D3	Lutron 2-wire phase, 1%				
	120V-D19	Hatch 2-wire phase, 1% (1,2)			

1 Not available for 9W

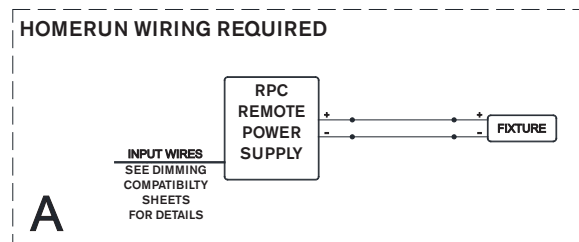
2 Not available for Warm Glow

3 Not available with 24W

* Wire gauge 14/12 = Maximum distance from light fixture to remote power supply is 100' using 12 gauge wire, 50' using 14 gauge wire.

* Wire gauge 18/16 = Maximum distance from light fixture to remote power supply is 100' using 16 gauge wire, 50' using 18 gauge wire.

** Emergency battery remote power supplies cannot be located any more than 50 feet from light fixture.



BeveLED Block[®] Surface - BLSD5

Square Downlight

BEVELED BLOCK SPECIFICATIONS

FIXTURE WEIGHT

BeveLED Block weighs 5 lbs

BODY

5-13/16" x 5-13/16" square die cast aluminum body available in a variety of powder coated paint finishes. Custom colors also available (provide RAL #).

MOUNTING

CC: Conduit cutout mounting fixtures are designed to mount to surface-mounted 4" octagonal junction boxes with surface-mounted conduit connections. CC housings have 4 keyslots, one in each side, and ship with one conduit cutout key and three solid cover keys installed in the housing. 2 additional conduit cutout keys are shipped with the fixture, and the different key types are interchangeable in the field. Please see installation instructions for drawings and more details.

RB: Recessed ceiling 4" octagonal junction box mounting fixtures are designed to mount to a ceiling retaining a recessed 4" octagonal junction box. The sides are solid and have no cutouts, please see drawings and installation instructions for more details.

SJ: Surface mounted 4" octagonal junction box mounting fixtures are designed to mount to a surface-mounted junction box that has electrical supply coming from the plenum (no surface-mounted conduit). The sides are solid and have no cutouts, please see drawings and installation instructions for more details

WARRANTY

Based on IESNA LM80-2008, BeveLED Block has a 50,000 hour rated life at 70% lumen maintenance (L70). USAI Lighting Warranty covers replacement parts for 5 years from date of shipment.

LISTINGS

Dry/Damp/Wet for RB and SJ mounting. CC mounting style is dry/damp only. NRTL/CSA-US tested to UL standards. IBEW union made.



NOTES

- Ambient temperatures at fixture location should not exceed 40°C during normal operation.
- Consult factory for video capture applications.

PHOTOMETRICS

Consult factory or website for IES files. Tested in accordance with IESNA LM79. www.usailighting.com/block

DIMMING DRIVER WIRING SCHEMES:

NOTES:

Wiring diagrams are examples of typical installations intended to illustrate the number of wires that must be run to fixture. These diagrams are not intended to specify all equipment necessary for a given dimming circuit. Refer to specific dimmer manufacturer's documentation for details.

IMPORTANT SAFETY INSTRUCTIONS

- SAVE THESE INSTRUCTIONS

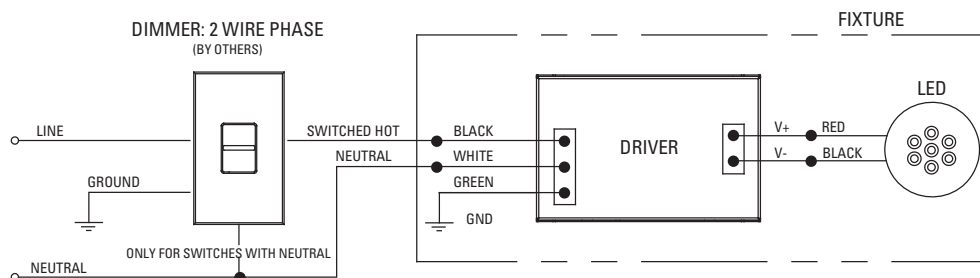
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2. Only qualified electricians in accordance to local codes should install these fixtures.
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4. Make sure all connections are in accordance with the National Electrical Code and any local regulations.
5. Cap any wires not used separately (not together).

D3 / DIML3 LED: Lutron Hi-Lume A-Series 2 Wire Fwd Phase (with neutral) / LED Dimming Driver Wiring (Dims down to 1%) 120V

D3 / DIML3 Dimmer Compatibility Chart					
Manufacturer	Product	Part Number	Dimmed Light Output Range	Qty Fixtures Per Dimmer*	
				Fixture Wattage	
120V Only				39W and Less	40W - 80W
ETC	Sensor+ Cabinet	ELV10	100% - 1%	1 – 26	1 – 13
ETC	Unison DRd Cabinet	ELV10	100% - 1%	1 – 26	1 – 13
Lutron	Maestro Wireless® 600W dimmer	MRF2-6ND-120-	100% - 1%	1 – 8	1 – 4
Lutron	Maestro Wireless® 1000W dimmer	MRF2-10ND-120-	100% - 1%	1 – 13	1 – 6
Lutron	HomeWorks® QS adaptive dimmer	HQRD-6NA-	100% - 1%	1 – 8	1 – 4
Lutron	HomeWorks® QS 600W dimmer	HQRD-6ND-	100% - 1%	1 – 8	1 – 4
Lutron	HomeWorks® QS 1000 W dimmer	HQRD-10ND-	100% - 1%	1 – 13	1 – 6
Lutron	Caseta Wireless® Pro 1000W dimmer	PD-10NXD-	100% - 1%	1 – 13	1 – 6
Lutron	Stanza® dimmer	SZ-6ND-	100% - 1%	1 – 8	1 – 4
Lutron	RadioRA® 2 adaptive dimmer	RRD-6NA-	100% - 1%	1 – 8	1 – 4
Lutron	RadioRA® 2 1000 W dimmer	RRD-10ND-	100% - 1%	1 – 6	1 – 3
Lutron	myRoom DIN power module	MQSE-4A1-D	100% - 1%	1 – 6	1 – 3
Lutron	HomeWorks® QS wallbox power module	HQRJ-WPM-6D-120-	100% - 1%	1 – 26	1 – 13
Lutron	Homeworks® DIN power module	LQSE-4A1-D	100% - 1%	1 – 6	1 – 3
Lutron	HomeWorks® wallbox power module	HWI-WPM-6D-120	100% - 1%	1 – 26	1 – 13
Lutron	GRAFIK Eye® QS control unit	QSGR-, QSGRJ-	100% - 1%	1 – 26	1 – 13
Lutron	GRAFIK Eye® 3000 control unit	GRX-3100-, GRX-3500-	100% - 1%	1 – 26	1 – 13
Lutron	RPM-4U module	HW-RPM-4U-120, LP-RPM-4U-120	100% - 1%	1 – 26	1 – 13
Lutron	RPM-4A module	HW-RPM-4A-120, LP-RPM-4A-120	100% - 1%	1 – 26	1 – 13
Lutron	GP dimming panels	Various	100% - 1%	1 – 26	1 – 13
Lutron	Ariadni CL 250W dimmer	AYCL-253P-	100%-1%	1 – 8	1 – 4
Lutron	Diva CL 250W dimmer	DVCL-253P-, DVSCCL-253P-	100%-1%	1 – 8	1 – 4
Lutron	Grafik T CL or RF CL dimmer	GT-250M-, GTJ-250M-	100%-1%	1 – 8	1 – 4
Lutron	Nova T CL 250W dimmer	NTCL-250-	100%-1%	1 – 10	1 – 5

* NOTE: Refer to dimmer manufacturer's documentation for installation instructions and circuit details.

**D3 / DIML3
2 WIRE PHASE DIMMING**



DIMMING DRIVER WIRING SCHEMES:

NOTES:

Wiring diagrams are examples of typical installations intended to illustrate the number of wires that must be run to fixture. These diagrams are not intended to specify all equipment necessary for a given dimming circuit. Refer to specific dimmer manufacturer's documentation for details.

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

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5. Cap any wires not used separately (not together).

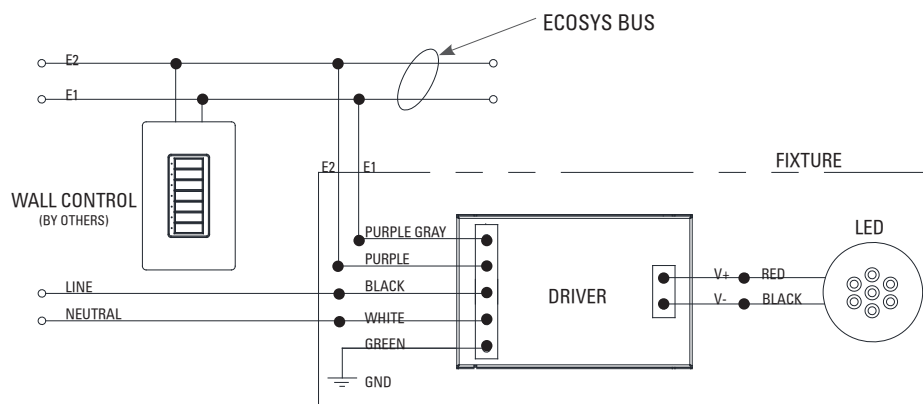
D4A / DIML4A LED: Lutron Hi-Lume Premier EcoSystem LED Driver (Dims down to 0.1%)

D4P / DIML4P LED: Lutron Hi-Lume Premier EcoSystem LED Driver (Dims down to 1%)

D4A / D4P EcoSystem Controls Dimmer Compatibility Chart			
Manufacturer	Product	Part Number	Maximum Quantity Light Fixtures Per Control
120V / 277V			
Lutron	PowPak dimming module	RMJ-ECO32-DV-B	32
		FCJ/FCJS-ECO	3
120V ONLY			
Lutron	Energi Savr Node	QSN-1ECO-S	64
		QSN-2ECO-S	128
	GRAFIK Eye QS/ Homeworks QS control unit	QSGRJ-__E, QSGR-__E	64
		QP2-__2C	128
	Quantum Hub	QP2-__4C	256
		QP2-__6C	384
		QP2-__8C	512
	HomeWorks QS / myRoom Plus power module	LQSE-2ECO-D	128

* NOTE: Number of fixtures may be higher if wattage is less than maximum values shown. Refer to dimmer manufacturer's documentation for installation instructions and circuit details.

D4A / DIML4A and D4P / DIML4P EcoSystem CONTROLS



DIMMING DRIVER WIRING SCHEMES:

NOTES:

Wiring diagrams are examples of typical installations intended to illustrate the number of wires that must be run to fixture. These diagrams are not intended to specify all equipment necessary for a given dimming circuit. Refer to specific dimmer manufacturer's documentation for details.

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5. Cap any wires not used separately (not together).

D4E / DIML4E LED: Lutron 5 Series EcoSystem LED Driver / LED Dimming Driver Wiring (Dims down to 5%)

D4E / DIML4E EcoSystem Dimmer Compatibility Chart					
Manufacturer	Product	Part Number	Dimmed Light Output Range	Qty Fixtures Per Control*	
120V / 277V				Fixture Wattage	
				39W and Less	40W - 80W
Lutron	PowPak dimming module	RMJ-ECO32-DV-B	100%–5%	1–32	1 – 16
Lutron	Energi Savr Node	QSN-1ECO-S, QSN-2ECO-S	100%–5%	1–64	1 – 32
Lutron	GRAFIK Eye QS (120V ONLY)	QSGRJ- E, QSGR- E	100%–5%	1–64	1 – 32
Lutron	Quantum	Various	100%–5%	1–64	1 – 32

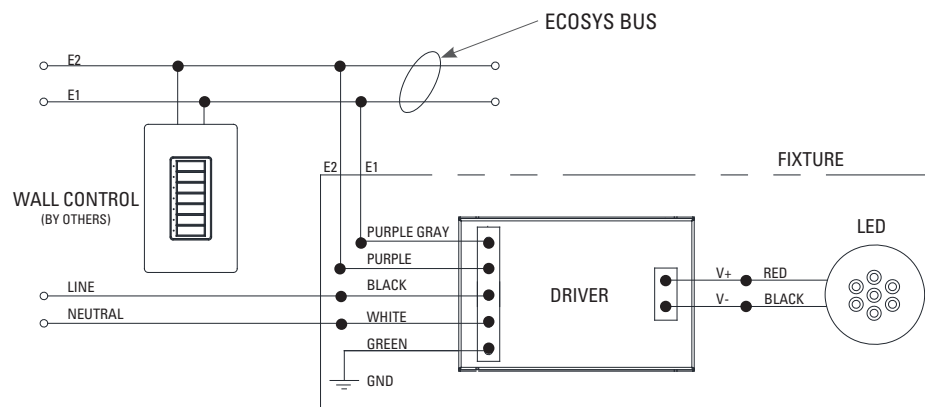
* NOTE: Number of fixtures may be higher if wattage is less than maximum values shown. Refer to dimmer manufacturer's documentation for installation instructions and circuit details.

D4H / DIML4H LED: Lutron H Series EcoSystem LED Driver with Fade to Black (dims down to 1%)

D4H / DIML4H EcoSystem Dimmer Compatibility Chart					
Manufacturer	Product	Part Number	Dimmed Light Output Range	Qty Fixtures Per Control*	
				Fixture Wattage	
120V / 277V				39W and Less	40W - 80W
Lutron	PowPak dimming module	RMJ-ECO32-DV-B	100%–1%	1–32	1–16
Lutron	Energi Savr Node	QSN-1ECO-S, QSN-2ECO-S	100%–1%	1–64	1–32
Lutron	GRAFIK Eye QS (120V ONLY)	QSGRJ- E, QSGR- E	100%–1%	1–64	1–32
Lutron	Quantum	Various	100%–1%	1–64	1–32

* NOTE: Number of fixtures may be higher if wattage is less than maximum values shown. Refer to dimmer manufacturer's documentation for installation instructions and circuit details.

D4E / DIML4E and D4H / DIML 4H EcoSystem CONTROLS



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5. Cap any wires not used separately (not together).

D6A / DIML6A and D6E / DIML6E LED Dimming Compatibility Table

D6A / DIML6A and D6E / DIML6E are linearly programmed dimming drivers for use with the dimming controls listed in the table below.

D6A / DIML6A = EldoLED SOLOdrive 0-10V control dims from 100% to 0.1%

D6E / DIML6E = EldoLED ECOdrive 0-10V control dims from 100% to 1%

D6A / DIML6A and D6E / DIML6E Dimmer Compatibility Chart					
Manufacturer	Product	Part Number	Dimmed Light Output Range		Qty Fixtures Per Dimmer*
120V & 277V			DIML6A	6E	Refer to manufacturer's dimmer load rating for maximum and minimum fixture quantities per dimmer.
Lutron	Diva	DVTV/NFTV with PP-20	99% - 0.1%	1%	
Lutron	Nova T	NTFTV with PP-20	99% - 0.1%	1%	
Lutron	Energi Savr Node	QSN-4T16-S	100% - 0.1%	1%	
Lutron	GP Dimming Panels	TVM2 Module	99% - 0.1%	1%	
Lutron	Interfaces	GRX-TVI w/ GRX3503	100% - 0.1%	1%	
Sensor Switch	nIO	nIO EZ	100% - 0.1%	1%	Enlighted compatible.
enlighted	Control Unit	CU-3E-1R	100% - 0.1%	1%	

D6B / DIML6B and D6F / DIML6F LED Dimming Compatibility Table

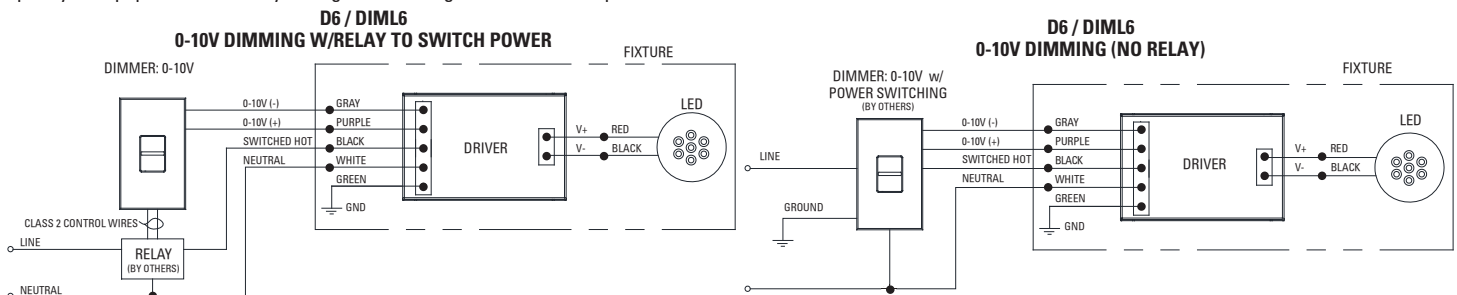
D6B / DIML6B and D6F / DIML6F are logarithmic-programmed dimming drivers for use with the dimming controls listed in the table below.

D6B / DIML6B = EldoLED SOLOdrive 0-10V control dims from 100% to 0.1% D6F / DIML6F = EldoLED ECOdrive 0-10V control dims from 100% to 1%

D6B / DIML6B and D6F / DIML6F Dimmer Compatibility Chart					
Manufacturer	Product	Part Number	Dimmed Light Output Range		Qty Fixtures Per Dimmer*
120V & 277V			DIML6B	6F	Refer to manufacturer's dimmer load rating for maximum and minimum fixture quantities per dimmer. Enlighted compatible.
Bush-Jaeger	Electronic potentiometer	2112U-101	100% - 0.1%	1%	
Jung	Electronic potentiometer	240-10	100% - 0.1%	1%	
Leviton	Iluma Tech dimmer	IP710-DLX	100% - 0.1%	1%	
Lightolier (Philips)	Momentum (120V ONLY)	ZP600FAM120	100% - 0.1%	1%	
Merten	Electronic potentiometer	5729	100% - 0.1%	1%	
Pass & Seymour	Titan	CD4FB-W	100% - 0.1%	1%	
Watt Stopper	Miro	DCLV1	100% - 0.1%	1%	
Synergy	Wallbox Dimmers	ISD BC	100% - 0.1%	1%	
ABB	i-bus	SD/S 2.16.1	100% - 0.1%	1%	
Crestron	Modules	GLX-DIMFLV8, GLXP-DIMFLV8	100% - 0.1%	1%	
Crestron	Green Light	GLPAC-DIMFLV4-, GLPAC-DIMFLV8-	100% - 0.1%	1%	
Crestron	Green Light Power Pack	GLPP-DIMFLVEX-PM, GLPP-1DIMFLV2EX-PM, GLPP-1DIMFLV3EX-PM	100% - 0.1%	1%	
Crestron	DIN Rail Analog Output Module	DIN-A08	100% - 0.1%	1%	
Crestron	DIN Rail 0-10V Fluorescent Dimmer	DIN-4DIMFLV4	100% - 0.1%	1%	
Crestron	iLux 0-10V Dimmer Expansion Module	CLS-EXP-DIMFLV	100% - 0.1%	1%	
enlighted	Control Unit	CU-3E-1R	100% - 0.1%	1%	

DIMMING DRIVER WIRING SCHEMES:

NOTES: Wiring diagrams are examples of typical installations intended to illustrate the number of wires that must be run to fixture. These diagrams are not intended to specify all equipment necessary for a given dimming circuit. Refer to specific dimmer manufacturer's documentation for details.



DIMMING DRIVER WIRING SCHEMES:

NOTES:

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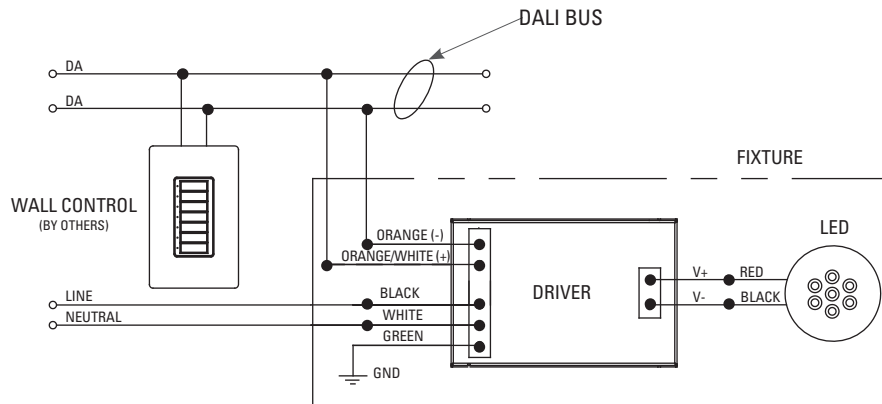
D7 / DIML7 and D7E Dimming Driver Wiring

D7 / DIML7 and D7E are linearly programmed dimming drivers.

D7 / DIML7 = EldoLED SOLOdrive DALI control dims from 100% to 0.1%

D7E = EldoLED ECOdrive DALI control dims from 100% to 1%

D7 / DIML7 / D7E DALI CONTROLS



DIMMING DRIVER WIRING SCHEMES:

NOTES:

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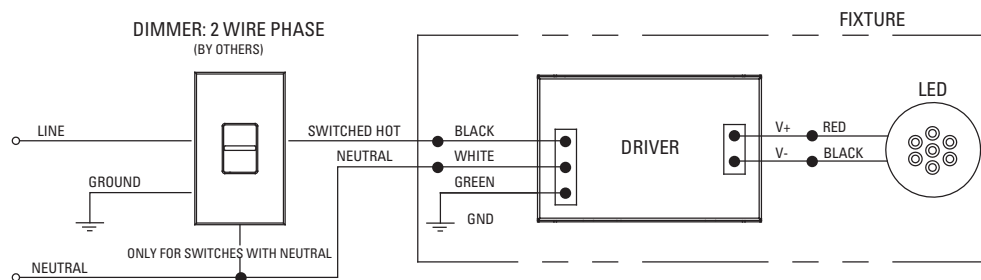
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5. Cap any wires not used separately (not together).

D19 / DIML19 LED: Hatch XTC series or equivalent - Forward and Reverse Phase Dimming Driver.
Dims down to 1% contingent upon dimmer specification and load. 120V only.

**D19 / DIML19
2 WIRE PHASE DIMMING**



D19 / DIML19 Dimmer Compatibility Chart

120V ONLY		
Forward Phase / TRIAC Dimming		
Manufacturer	Product	Qty Fixtures Per Dimmer
Leviton	IPL06-10Z	Use fixture wattage per fixture specification sheet to determine number of fixtures per dimmer. Max number of fixtures is limited by dimmer load rating.
	6613-xxx	
Lutron	S-600P	
	S-603P	
	DV-600P	
	DV-603P	
	DVSC-603P	
	CT-600P	
	CT-603P	

120V ONLY		
Reverse Phase / ELV Dimming		
Manufacturer	Product	Qty Fixtures Per Dimmer
Leviton	6615	Use fixture wattage per fixture specification sheet to determine number of fixtures per dimmer. Max number of fixtures is limited by dimmer load rating.
	IPE04-xxx	
Lutron	NTELV-300	
	NTELV-600	
	SELV-300P	
	SELV-303P	
	DVELV-300P	
	DVELV-303P	

SRT2 EDGE-LIT

CEILING/SURFACE/GARAGE

FEATURES

- Edge-lit optical assembly delivers exceptional uniformity over the entire lens with indirect illumination that reduces glare and improves visual comfort
- Low profile housing intended for 8' - 20' mounting heights for surface, trunnion/yoke or pendant mounting
- Applications include parking garage, walkway or building canopies, corridors, tunnels, large stairwells and other interior applications
- Multiple optical distributions are available making the Beacon Edge-Lit luminaire both versatile and functional
- UL/cUL listed for wet locations, IP65 and 3G vibration rated
- Ambient temperatures of up to 40°C

CONTROL TECHNOLOGY

NX DISTRIBUTED INTELLIGENCE™ **wiSCAPE**™

SPECIFICATIONS

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 4,000–16,000
- Five distribution types: Type V Square, Type V Rectangular, Type V Concentrated, Type V Wide or Asymmetric (Type 3/4)
- Wide variety of CCT's and CRI's offered: 3000K (70CRI), 3000K (80CRI), 3500K (80CRI), 4000K (70CRI), 4000K (80CRI) or 5000K (70 CRI) CCT

ELECTRICAL

- 120V–277V 50/60Hz with 347V and 480V available
- 0-10V dimming drivers are RoHS compliant and IP66
- Surge protection – Standard 10kA with optional end of life LED indicator

INSTALLATION

- Standard quick mount plate over standard 4" square junction box or octagonal box and allows for simplified fixture installation.
- Standard luminaire accepts a rigid or free-swinging 3/4" NPT stem for pendant mount via wet location j-box (by others)
- Optional bird deterrent shroud available for field installation
- Optional trunnion/yoke mount available for field installation

OPTIONS/CONTROLS

- Standalone occupancy sensor available for on/off or dimming operation
- NX Distributed Intelligence™ available with in fixture wireless control module, features dimming and occupancy sensor
- wiSCAPE® available with in fixture wireless control module, features dimming and occupancy sensor
- UL924 device available for standalone and wireless control override during power interruptions
- Uplight option provides approximately 800 lumens and consumes only 8 additional watts
- Integral battery backup option available with and without heater. Rated for 0°C (without heater) and -30°C (with heater)
- Emergency lighting relay available for generator or central inverter supplied lighting
- Vandal resistant wire guard available as an option for factory installation or as an accessory for field installation

RELATED PRODUCTS

- [Drive Edge-Lit SRT1](#)
[Arceos™ ARS Surface](#)
[Endura](#)

CERTIFICATIONS

- Listed to UL1598 for use in wet location, listed for -40°C to 40°C applications
- IDA approved with zero uplight for 3000K and warmer CCTs
- IP65

WARRANTY

- 5 year warranty
- See [HLI Standard Warranty](#) for additional information

KEY DATA	
Lumen Range	4000–16000
Wattage Range	30–140
Efficacy Range (LPW)	110–135
Reported Life (Hours)	L70>50K
Weight lbs. (kg)	15 (5.8)

SRT2 EDGE-LIT

CEILING/SURFACE/GARAGE

ORDERING GUIDE

Example: SRT2 30 3K7 5QW UNV GT WG

CATALOG #

Series	Engine	CCT	Distribution	Voltage	Color/Finish	Options
SRT2 Edge-Lit Parking Garage Size 2	30 30W Nominal 4000 lm	3K7 3000K, 70 CRI	5QW Type Square Wide ¹	UNV 120V- 277V	BL Textured Black	CD Continuous Dimming ⁶
	50 50W Nominal 6000 lm	3K8 3000K, 80 CRI	5RW Type 5 Rect. Wide ¹	120 120V	DB Textured Dark Bronze	WG Wire Guard
	65 65W Nominal 8000 lm	35K8 3500K, 80 CRI	5C Type 5 Concentrated	208 208V	GT Graphite Textured	UD Uplight Module ³
	85 85W Nominal 10000 lm	4K7 4000K, 70 CRI	5W Type 5 Wide ⁴	240 240V	GYS Smooth Gray	F Single Fuse (120, 277, 347V) ²
	100 100W Nominal 12000 lm	4K8 4000K, 80 CRI	ASY Asymmetric (Type 4) ¹	277 277V	PS Smooth Plat. Silver	F Double Fuse (208, 240, 480V) ²
	120 120W Nominal 14000 lm	5K7 5000K, 70 CRI		347 347V	WH Textured White	E EM Battery Pack (0°C) ²
	140 140W Nominal 16000 lm			480 480V	CC Custom Color	EH EM Battery w/Heater (-30°C) ²
						ELR Emergency Lighting Relay ³
						LD3 36" Lead Length ⁵
						LD6 72" Lead Length ⁵
						LD9 108" Lead Length ⁵
						SP10K 10kA Surge Protection with End of Life LED Indicator
						LMB Less Mounting Bracket

Control Options	
NX Standalone	
NXOS-12F	NX Distributed Intelligence™, PIR Occ. Sensor, Dimming Daylight Harvesting, up to 12' MH
NXSP-30F	NX Distributed Intelligence™, PIR Occ. Sensor, Dimming Daylight Harvesting, up to 30' MH
NXOS924-12F	NX Distributed Intelligence™, PIR Occ. Sensor with UL924 dimming bypass module for controls override, up to 12' MH ³
NXSP924-30F	NX Distributed Intelligence™, PIR Occ. Sensor, with UL924 dimming bypass module for controls override, up to 30' MH ³
NX Networked – Wireless¹	
NXWE	NX Distributed Intelligence™ Wireless Enabled (module + radio)
NXOSW-12F	NX Distributed Intelligence™ Wireless, PIR Occ. Sensor, Dimming Daylight Harvesting, up to 12' MH
NXSPW-30F	NX Distributed Intelligence™ Wireless, PIR Occ. Sensor, Dimming Daylight Harvesting, up to 30' MH
NXWE924	NX Distributed Intelligence™ Wireless Enabled with UL924 dimming bypass module for controls override ³
NXOSW924-12F	NX Distributed Intelligence™ Wireless, PIR Occ. Sensor with UL924 dimming bypass module for controls override, up to 12' MH ³
NXSPW924-30F	NX Distributed Intelligence™ Wireless, PIR Occ. Sensor with UL924 dimming bypass module for controls override, up to 30' MH ³
wiSCAPE® – Wireless¹	
WIR	Wireless Controls, wiSCAPE®
WIRSC	wiSCAPE® + occupancy sensor
WIR924	Wireless Controls, wiSCAPE® with UL924 dimming bypass module for controls override ³
WIRSC924	wiSCAPE® + occupancy sensor with UL924 dimming bypass module for controls override ³
Sensor Controls	
SCP-8F	Remote control programmable line voltage sensor (8-12' recommended MH)
SCP-20F	Remote control programmable line voltage sensor (12-20' recommended MH)
SCP924-8F	Programmable sensor with UL924 dimming bypass module for controls override (8-12' recommended MH) ³
SCP924-20F	Programmable sensor with UL924 dimming bypass module for controls override (12-20' recommended MH) ³

Accessories (Order Separately)

- ☐ **SRT2-WG** Wire Guard for SRT2 version
- ☐ **SRT-MB** Mounting bracket for pre-installation
- ☐ **SRT2-BRD** Bird deterrent shroud for SRT2 version, not available with uplight or trunnion mount
- ☐ **SRT2-TM** Trunnion/Yoke accessory for SRT2 version
- ☐ **SCP-REMOTE** Remote control for SCP option; order at least on per project to program and control

Notes:

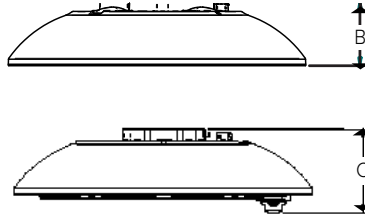
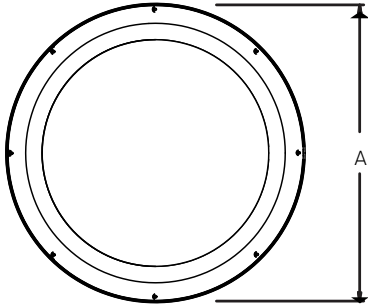
- 1 Up to 85W light engines only
- 2 Must specify voltage, 120V or 277V for E and EH
- 3 Universal voltage only
- 4 100–140W light engines only
- 5 Standard wire lead length 24"
- 6 Specify when using external 0-10V dimming system

SRT2 EDGE-LIT

CEILING/SURFACE/GARAGE

DIMENSIONS

SRT2



A	B	C	Weight
18.5" (469mm)	4.0" (1mm)	5.2" (132mm)	15bs (6.8kg)

ADDITIONAL INFORMATION

MOUNTING



Surface Mount

Mounting plate with "quick mount" hanger for one person simple installation.



Pendant Mount

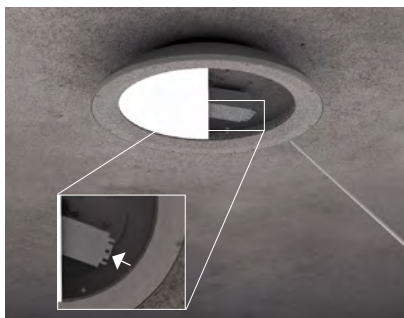
Standard 3/4" threaded entry for pendant applications.



Trunnion/Yoke Mount

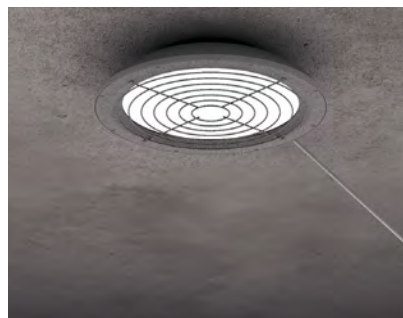
Multiple position trunnion mount adjusts 9" up and down for positioning in 1" increments.

ACCESSORIES AND SERVICES



Battery Backup

Integral battery backup option available on SRT2 version.



Wire Guard

An optional wire guard can be specified at the factory or as an accessory for field installation.



Bird Deterrent

An optional bird shroud deterrent can be specified at the factory or as an accessory for field installation.

SRT2 EDGE-LIT

CEILING/SURFACE/GARAGE

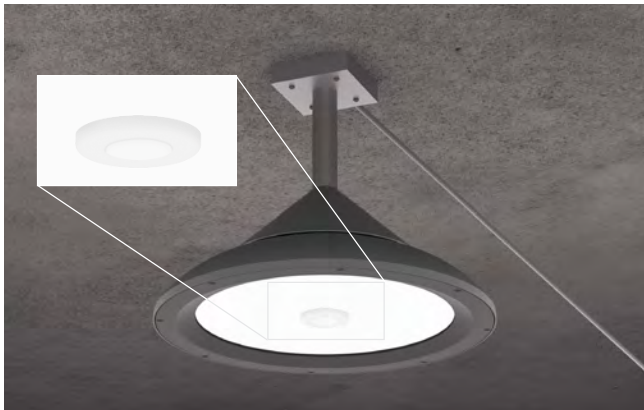
ADDITIONAL INFORMATION (CONT'D)

UPLIGHT

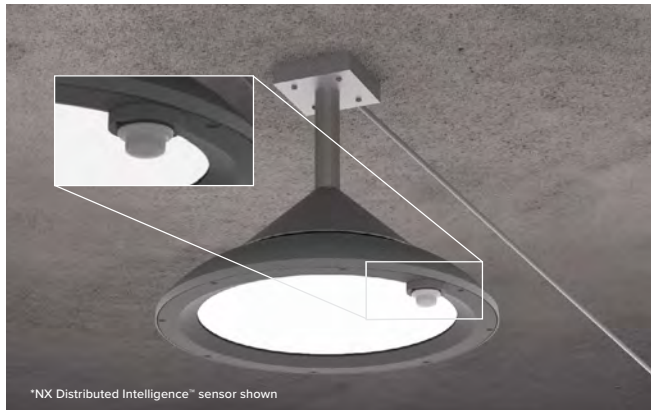
Optional uplight module provides 800 lumens of indirect illumination for improved visual quality while eliminating cave effect.



CONTROLS



Standalone Controls



Wireless Controls

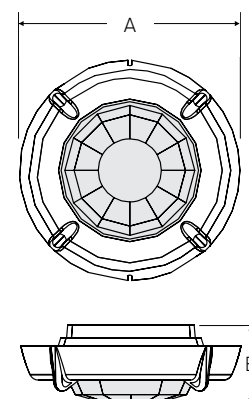
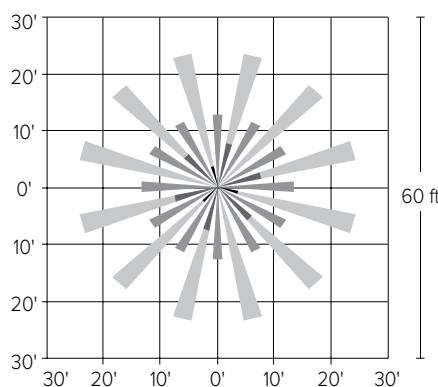
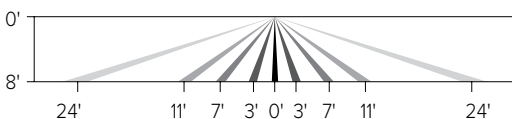
Optional passive infrared sensors are available for basic occupancy and daylight sensing. Programmable via remote or Bluetooth® phone app.

NX DISTRIBUTED INTELLIGENCE

wiSCAPE™
WIRELESS OUTDOOR LIGHTING SYSTEM

Optional NX Distributed Intelligence™ and wiSCAPE® wireless controls are available for SRT2 versions (with or without occupancy sensing).

SCP-8F



A	B
2.3" (59mm)	.8" (20mm)

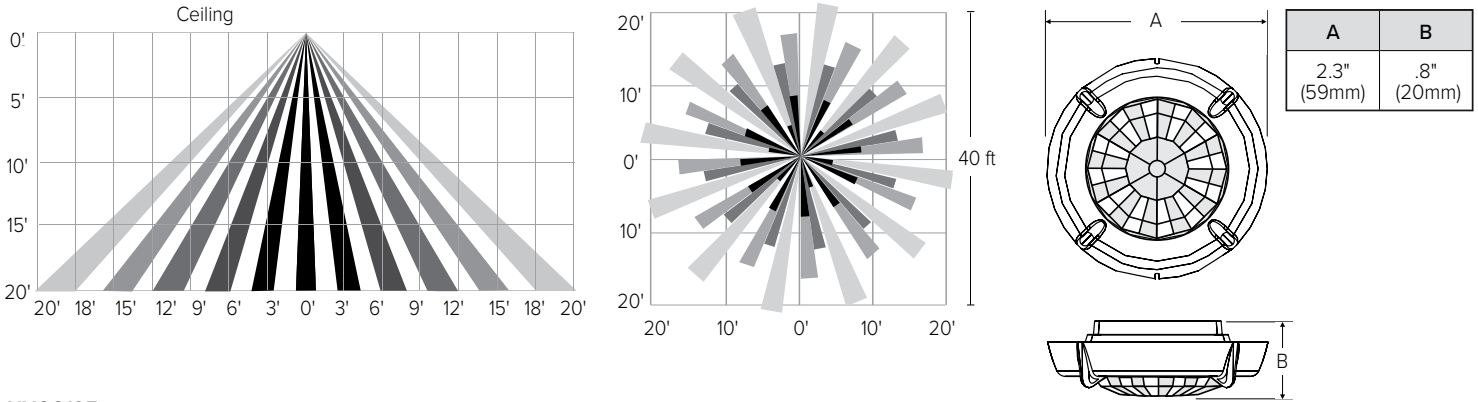
SRT2 EDGE-LIT

CEILING/SURFACE/GARAGE

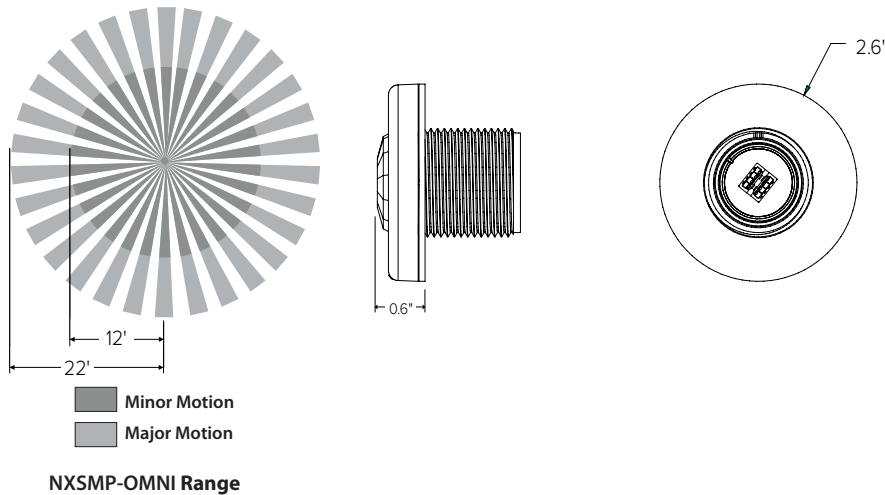
ADDITIONAL INFORMATION (CONT'D)

CONTROLS (CONT'D)

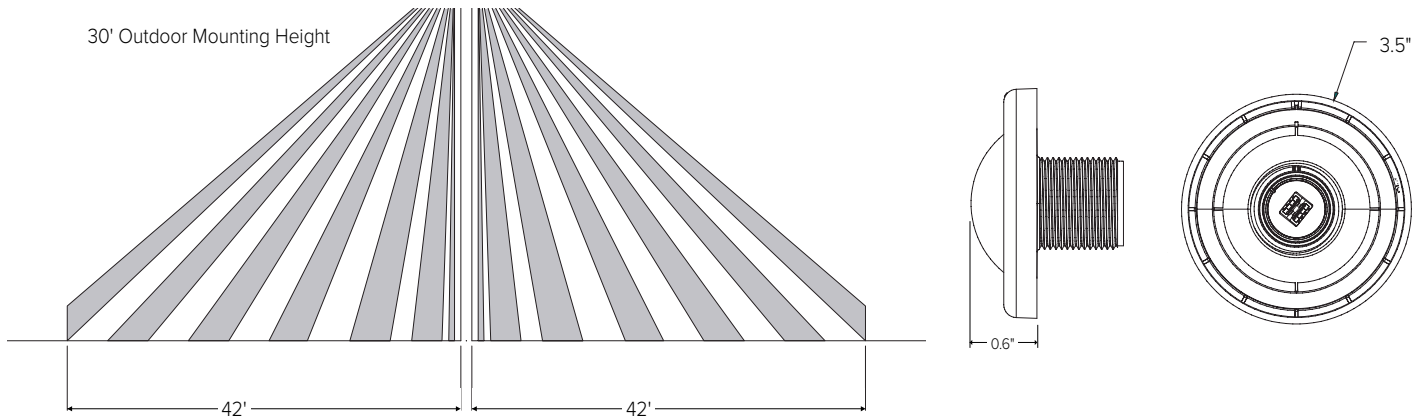
SCP-20F



NXOS12F



NXSP30F



USE OF TRADEMARKS AND TRADE NAMES

All product and company names, logos and product identifies are trademarks ™ or registered trademarks ® of Hubbell Lighting, Inc. or their respective owners. Use of them does not necessarily imply any affiliation with or endorsement by such respective owners.

JOB _____ TYPE _____

NOTES _____ APPROVALS _____

FEATURES

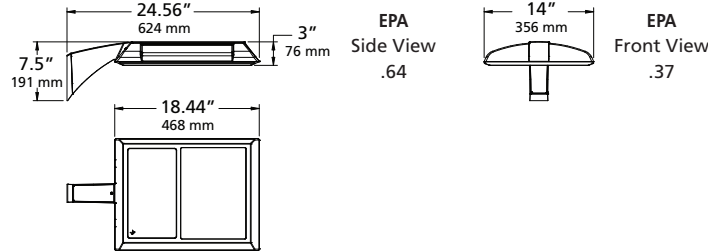
- Elegant form factor
- High performance optics provide up to 17,500 delivered lumens
- Diffusion lens for low glare comfort
- NX™ wireless control options
- IP66

CERTIFICATIONS



3000K and warmer CCTs only

SPECIFICATIONS



Weight: 21.5 lbs / 9.75 kg

ORDERING CODE

Series	LED Engine	CCT	Distribution	Rotation	Voltage	Mounting
ALT1 Altitude	No Lens 28L-20 3,000 lm 28L-40 5,000 lm 28L-60 7,500 lm 28L-85 10,000 lm 54L-95 12,500 lm 54L-120 15,000 lm 54L-155 17,500 lm	AM Amber 3K7 3000K, 70 CRI 4K7 4000K, 70 CRI 5K7 5000K, 70 CRI 3K8 3000K, 80 CRI 4K8 4000K, 80 CRI 3K9 3000K, 90 CRI	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)	Blank for no rotation L ¹ Optic rotation left R ¹ Optic rotation right	UNV 120-277V 347 347V 480 480V	ASQ Arm Square pole A34 Arm mt 3.3-4.2" OD pole A46 Arm mt 4.5-6.0" OD pole MAF Horizontal Slipfitter 2 3/8" OD arm SVSF Vertical Slipfitter Mount square for 2" pipe tenon, (2-3/8" O.D.) VSF Vertical Slipfitter Mount for 2" pipe tenon, (2-3/8" O.D.) WB Wall Bracket for area wall mount
Fixture Finish	Control Options			Options	Control Accessories	
BL Black DB Dark Bronze GT Graphite LG Light Gray PS Platinum Silver TT Titanium WH White CC Custom Color [†] †Consult factory	7PR 7 pin PCR, wireless control enabled 7PR-TL 7 pin PCR with twist lock photocontrol 7PR-SC 7 pin PCR with shorting cap 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 NXSP14F ^{2,3} Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' NXSP30F ^{2,3} Wired NX, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' NXSPW14F ^{2,3} NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 14' NXSPW30F ^{2,3} NX Wireless, PIR Occupancy Sensor, Dimming Daylight Harvesting, 30' 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 programmable line voltage sensor, use with SCPREMOTE SCP-40F Remote control programmable line voltage sensor, use with SCPREMOTE SWP ^{2,3,4} Site Sync™ Pre Commission Wireless Module SWPM-40F ^{2,3,4} Site Sync with Sensor 9' to 40' MH	BC ⁵ Backlight Control SF Single Fuse DF Double Fuse TB Terminal Block CLR Clear Lens HDL ⁶ Diffuse Lens	SCPREMOTE Remote control for SCP option. Order at least one per project to program and control the occupancy sensor SW7PR SiteSync™ on fixture module via 7PR SWUSB SiteSync™ Software on USB SWTAB SiteSync™ Windows Tablet SWBRG SiteSync™ Wireless Bridge Node SWFC SiteSync™ Field Commission Service WIR-RME-L wiSCAPE™ External Fixture Module NXOFM-1R1D-UNV NX External Contol Node		

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 and 5W distributions.
2 Not available with other sensor or wireless control options.

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 and 5W distributions.
- 2 Not available with other sensor or wireless control options.
- 3 Not available in 480V.
- 4 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.
- 5 Not available with Type 5 distributions, CLR, or HDL option.
- 6 Only available in Type 3 or Type 5W

Kim Lighting reserves the right to change specifications without notice.

LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	3,000	20	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
			HDL Lens	5W	2829	2	0	1	129	2977	2	0	1	135	3017	2	0	1	137
				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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	5,000	40	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
			HDL Lens	5W	4430	3	0	1	117	4663	3	0	1	123	4725	3	0	1	124
				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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	7,500	60	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	10,000	85	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	
54	12,500	95	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

Kim Lighting reserves the right to change specifications without notice.

LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	
54	15,000	120	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	2	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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LUMINAIRE PERFORMANCE

LED #	Nominal Lumen Package	Nominal Wattage	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	
54	17,500	155	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	1	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

Lumen Multiplier		
CCT	80 CRI	90 CRI
3000K	0.9119	0.7033
4000K	0.8941	N/A

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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

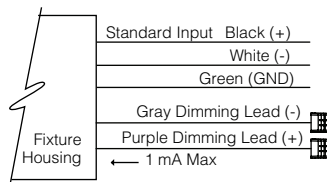
- Standard programmable driver allows for programmable drive current settings.
- Electrical components are strategically located in the driver gear compartment with a molded silicon grommet seal to provide separation from the optical chamber.
- Maximum lightning surge current 20KA with thermally protected 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 (350mA to 700mA).

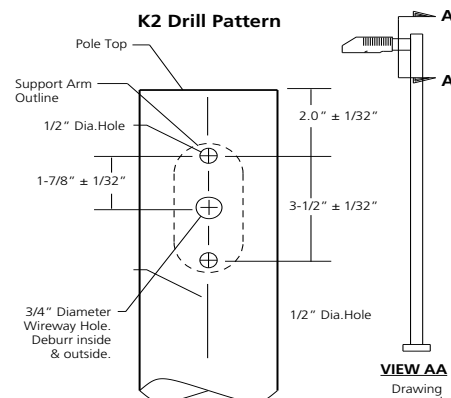
Dimming:

- 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.



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.

Fusing:

SF for 120, 277, and 347 Line volts

DF for 208, 240, and 480 Line volts

High 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 (BL) Black, (DB) Dark Bronze, (GT) Graphite, (PS) Platinum Silver, (LG) Light Gray, (TT) Titanium, (WH) White, and (CC) Custom Color (Include RAL#).

Certifications and Listings:

- UL 1598 Standard for Luminaires.
- UL 8750 Standard for Safety for Light.
- ANSI C136.31-2010 3G Vibration tested and compliant.
- IDA approved, 3000K and warmer CCTs only
- IP66 Certified

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.hubbellighting.com/resources/warranty>

Kim Lighting reserves the right to change specifications without notice.

CONTROLS

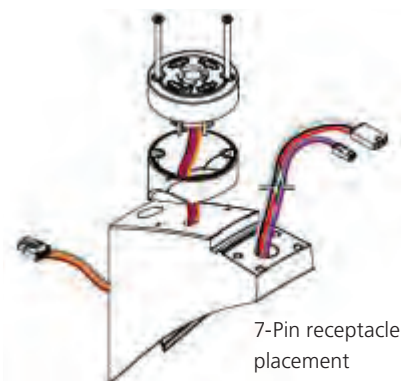
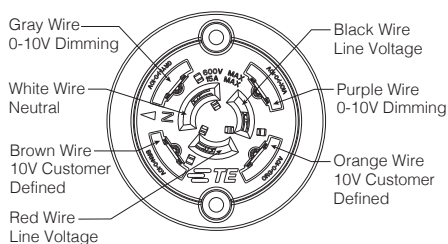
Photocell Receptacle

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.



High mode: 10V - Low mode: 1V - Ramp-up rate: disabled - Fade-down rate: disabled - Photocell: Off - Sensitivity: Full - Time Delay: Fade to low: 5 minutes - Time Delay: Fade to off: 1 hour

- The SCP enables any wall mounted luminaire, in excess of 75 watts, to meet California Title 24 requirements with integral 10KA surge protection for added reliability and serviceability. For more detail: http://www.aal.net/products/sensor_control_programmable

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.

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.

Wireless Controls

- Optional universal voltage (120-277V) for dusk to dawn energy savings. Photocontrol is factory installed inside the housing with a fully gasketed sensor on the side wall. For multiple fixture mountings, one fixture is supplied with a photocell to operate the others.
- Occupancy Sensor shall be programmable and use passive infrared (PIR) sensing technology that reacts to changes in infrared energy (moving body heat) within the coverage area. Careful consideration must be given to obstructions that may block the sensor's line of sight.
- Factory default settings for SCP option shall be:-

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¹PRECOMMISSIONED 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.

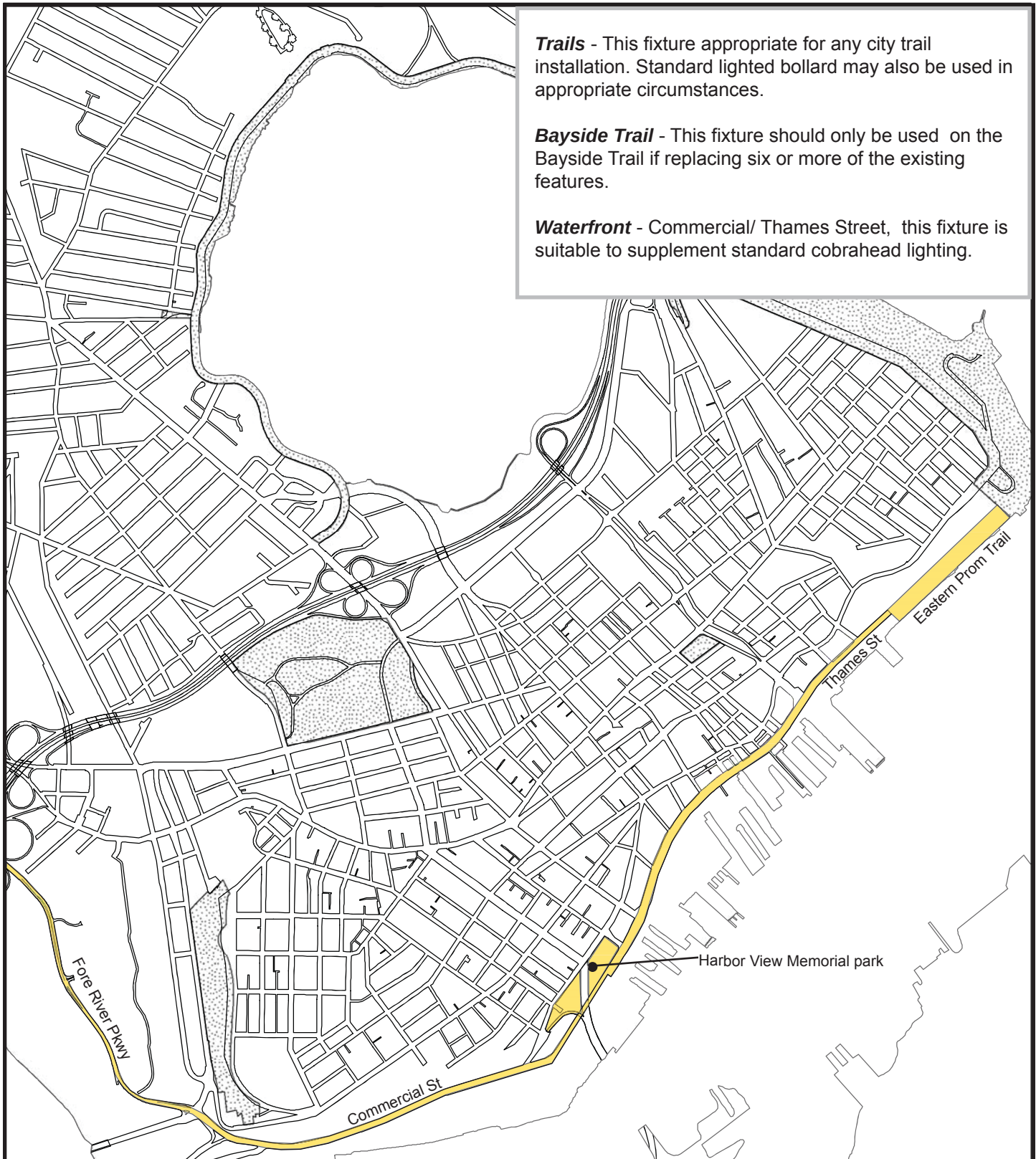
SiteSync fixtures with occupancy sensor (SWPM) require the mounting height of the fixture for selection of the lens.

²Voltage, ³Color, ⁴Pole Diameter,

Trails - This fixture appropriate for any city trail installation. Standard lighted bollard may also be used in appropriate circumstances.

Bayside Trail - This fixture should only be used on the Bayside Trail if replacing six or more of the existing features.

Waterfront - Commercial/ Thames Street, this fixture is suitable to supplement standard cobrahead lighting.

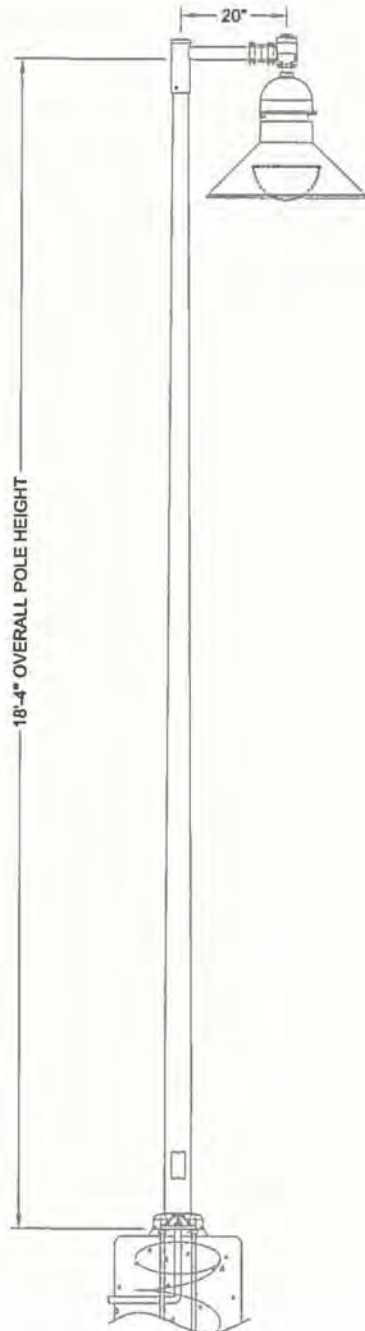


Date: March, 2019	CITY OF PORTLAND, MAINE TECHNICAL MANUAL	MUNICIPAL STREET LIGHTING STANDARDS SECTION 10	Figure: X-8A
Revised Date:	MAP: Decorative Light - TRAILS/ WATERFRONT		



PORTLAND | me

Street & Sidewalk Lighting DECORATIVE LIGHT - TRAIL/WATERFRONT



LUMINAIRE

Holophane GlasWerks LED Hallbrook Series
Model: GELB-050-3K-AS-4-B-3-P7E-DM

Pendant mount
IES Type IV Distribution
Thermal resistant prismatic glass lens held in a formed aluminum door frame.
50 watts
Universal Voltage (120-277V)
Dimming driver with 7-pin photocontrol receptacle
LED 3000K color temperature

BRACKET ARM

Aluminum crossarm with a post-top fitting for a 2-3/8" by 6" tenon.

SLIP FITTER

Holophane Glasswerks Slip Fitter
Model SG20/1-BK

2-3/8" O.D. with swivel cast fitter.

LIGHTING POLE

Holophane
Model: RTA1850E-PL-ND-BK-4

Aluminum pole shaft rated for a 90 mph wind load with a 1.3 gust factor.

Provide four hot-dipped galvanized steel L-type anchor bolts. Lighting pole shall be hot dipped galvanized prior to powder coat paint.

DIMENSIONS

Overall Height = 18' 4"
Bracket Arm = 1' 6"

FINISH

Black (standard) - polyester powder coat

APPLICATION

Trails: Appropriate for any city trail installation.
Waterfront (Commercial/Thames St): Supplemental pedestrian lighting to standard cobrahead lighting.

Spacing:
One side: 90' - 125' on center
Alternating sides: 175' - 225' ft on center

Follow established pattern. Single arm oriented over trail or street; Double-arm used in medians or similar.

Date:
March, 2019

CITY OF PORTLAND, MAINE
TECHNICAL MANUAL

MUNICIPAL STREET
LIGHTING STANDARDS
SECTION 10

Figure:

X-8B

Revised Date:

**TRAILS / WATERFRONT
(COMMERCIAL/THAMES STREET)**

J.B. Brown & Sons
10 Free Street, Suite 100
P.O. Box 207
Portland, ME 04112-0207
207-774-5908 (phone) 207-774-0898 (fax)

Att. H

I, Vincent P. Veroneau, hereby certify that a neighborhood meeting was held on February 13, 2020 at 321 Commercial Street, Portland, Maine at 5:30PM for the proposed project located at 113 West Commercial Street.

I also certify that on January 28, 2020, invitation mailed to the following:

1. All addresses on the mailing list provided by the Planning Division which includes property owners within 500 feet of the proposed development or within 1,000 feet of a subdivision within an industrial zone or industrial zone change.
2. Residents on the "interested parties" list.

Signed,



Vincent P. Veroneau

February 20, 2020

Attached to this certification are:

1. Copy of the invitation sent
2. Sign-in sheet
3. Meeting minutes

J.B. BROWN & SONS

10 Free Street
Portland, ME 04101
207-774-5908 (phone)

January 29, 2020

Dear Neighbor:

Please join us for a neighborhood meeting to discuss our plans to construct a Veteran's Administration Health Clinic and structured parking garage located at 113 West Commercial Street, Portland, Maine.

Meeting Location: Casco Bay Conference Room – 2nd floor, Courtyard by Marriott Hotel
321 Commercial Street, Portland, ME

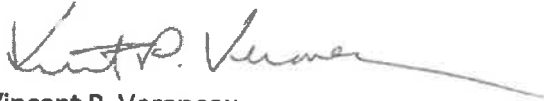
Meeting Date: Thursday, February 13, 2020

Meeting Time: 5:30pm

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 taken. Both the sign-in sheet and minutes will be submitted to the Planning Board.

If you have any questions, please call me at (207) 774-5908.

Sincerely,



Vincent P. Veroneau

Note:

Under Section 14-32(C) and 14-524(a)d of the City Code of Ordinances, an applicant for a Level III development, subdivision of over five lots/units, or zone change 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: jrather@portlandmaine.gov

Neighborhood Meeting Attendance

On February 13, 2020 the following members of the public met at the Courtyard by Marriott on 321 Commercial Street, Portland, Maine to discuss the development of a new 2-story 68,000sf medical clinic building, 150 surface parking spaces, and a 378 space structured parking garage on 8 acres of land located at 113 West Commercial Street, Portland, Maine.

Name	Address	Contact email or phone #
Sara Miller	96 Salem	Sara@snapdragonsps.com
LAURA ROBINSON	320 DANFORTH ST	laurarobinson_studio@gmail.com
Tom ROBINSON	320 DANFORTH ST	Thom.robinson@gmail.com
Debi & Clet Kruk	370 Danforth St.	dkruk@maine.rr.com
Sarah Daigault	350 Danforth St	spdaigault@gmail.com
Vin Veroneau	10 Free St.	veroneau@jbbrown.com
Bob Vallee	10 Free St.	bobvallee@jbbrown.com
GRIFFIN HERNYAK	1001 19TH ST NW WASHINGTON DC	ghernyak@fdstonewater.com
Kevin Carley	112 Salem St	kpcarley@gmail.com
Stephen Bushy	Corrill Palmer	sbushy@corrillpalmer.com
CONSTANCE BLOOMFIELD	382 DANFORTH	cbloomfi@maine.rr.com
Jaime Parker	305 Commercial	jaime@trails.org
JUDY Brueijer	342 Danforth St	judybrueijer@gmail.com
Kate Melican	348 Noble	kmetea@gmail.com

MEETING MINUTES
VA CLINIC – FEBRUARY 13, 2020

On February 13, 2020, Vin Veroneau from J.B. Brown & Sons presented the project at a neighborhood meeting using a PowerPoint presentation, which provided information the project team members along with an overview of the medical office building and structured parking garage. Stephen Bushey, the civil engineer working on the project, was also in attendance and available to answer questions regarding the site design and traffic. After the presentation, there was an opportunity for attendees to ask questions with the following items covered:

Will the front beacon/stair towers at the front of the building be a light issue for the houses in the back and how long will they be on?

We do not anticipate light from the front lobbies to be an issue to the houses on Danforth Street.

Will there be lights on top level of the garage and will they turn off at night or be motion activated?

Yes. There will be lights on the top level of the garage. We will explore the option of motion detection to see if that will meet the life safety requirements.

Who will be managing the garage and will there be on-site parking operator?

J. B. Brown & Sons will be the property manager, but we do not anticipate an on-site garage operator.

What is the allocation of staff and patient parking?

Staff parking is 150 spaces on grade and 250 spaces in the garage for patients.

Will the parking garage be considered for tourist, visitor, or service industry parking and how much will the parking cost?

We do not have a current user for the additional parking spaces, but we anticipate potential use from fisherman and office users that are having difficulty finding and affording parking in the central business district. We do not have pricing set at this point, but it will be significantly less than the \$150– \$200 per month currently downtown.

Will the on grade parking have foliage?

Yes, the islands will have trees.

Would you consider adding landscaping/foliage to the top level of the garage, Possibly potted trees?

We have not considered foliage on the top level of the garage, but we are happy to research the possibility of adding some greenery on the top level. Possibly potted plants in the corners.

Where will snow removal be stored and will snow be kept on top level of the garage?

We have identified snow storage on-site and will remove snow off site as needed.

Is this a 24-hour facility and will there be security staff?

The VA operation is currently Monday through Friday roughly 7:30 AM to 6 PM. I am not sure of the VA's security staff, but we will have off hours security patrols as we do in our adjacent properties.

Will there be prescription drugs in the building?

I am not sure, but I assume they would have similar prescription drugs on the site as a typical primary provider would have, such as Intermed.

Is a path or a street getting put in between the garage and Star Match Building and is Emery Street an accepted Portland street?

There will be access to the garage and the Star Match building parking lot via the lower portion of Emery Street. We are designing a pedestrian walkway between W. Commercial St. and the upper portion of Emery Street. Emery Street is an accepted Portland street, but we are in discussions to discontinue the street with continued public access.

What kind of trail/walkway will be put between W. Commercial St. and lower Emery Street? Can it be more permanent than just timbers with stone dust?

We anticipate a trail/walkway of stone dust and granite/stone steps. Given the steep grade, we switchbacks will be incorporated but it will still be a relatively steep climb.

Will there be a trail in front of them medical building, when will it be built, and how big will it be?

There will be a 10-foot multi use path in front of the building that is constructed of pavement.

Was there a traffic study done? And will there be a traffic light?

Yes, there was a traffic study done and a traffic light is not warranted. A turning lane has been designed for the center of W. Commercial St.

Did the traffic study consider traffic bleeding over onto Danforth?

Yes. We had a traffic scoping meeting with the City and expanded our study area to include intersections away from the project and other developments planned in the area.

Do you plan on cutting into the top of the hill at the back of the property? Will that cause a stability issue? How far will the cut be?

We anticipate some cut into the back hill, but are trying to limit that impact. A Geotech report was prepared and to the extent necessary, appropriate retaining walls will be installed at the back edge of the property and along W. Commercial St.

Is the patient load of this facility larger than the existing facility on commercial Street?

Yes, the facility is larger and has expanded uses beyond the services provided at the current facility.

Where is the trash located and when will it be picked up?

A trash receptacle corral is located at the back of the property. We will look to have the trash removed as close to normal business hours as possible.

Is VA leasing the clinic and are there property taxes associated with the site?

Yes, the VA has signed a 20-year lease on the property and property taxes will be paid on the facility.

Did the VA come to you asking for this land as it seems like an odd location for their facility?

No, the VA did not specifically come to us. We responded to a public request for proposal and were chosen based on our submission.

Have you considered installing solar panels?

We are exploring the possibilities of adding solar to the top of the garage, but have not determined whether that is a feasible option at this point.

What are the next steps and what is the construction timeline?

We have a planning board workshop scheduled for Tuesday, February 25. We expect that there will be a public hearing in early April with construction beginning in May in anticipation of a July 2021 occupancy by the VA.

The meeting adjourned at roughly 6:45pm.

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 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**
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
Yes ☒	NA ☐	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
Yes ☒	NA ☐	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
Yes ☒	NA ☐	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)
Yes ☐	NA ☒	Public Transit (14-526 (a) 3), if applicable - Existing available transit services - Proposed site plan design details, such as easement, pad base, and shelter
Yes ☒	NA ☐	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
Yes ☒	NA ☐	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)
Yes ☒	NA ☐	Snow Storage (14-526 (a) 4 d) Management plan for snow removal and locate snow storage areas on plan
Yes ☒	NA ☐	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)

- ☒ Must be in compliance with Technical Manual, Section 13

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

Existing Conditions

- ☒ Approximate location of structures on abutting property
- ☒ Topography
- ☐ Locate water courses
- ☐ Delineate wetlands
- ☒ Zone lines

Proposed Site Plan

- ☒ Ground floor area, and grade elevations for all buildings

Access, Circulation, and Parking

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

Site Considerations

- ☒ Identify snow storage areas
- ☒ Location of fire hydrants
- ☒ Location of solid waste management facilities

UTILITY PLAN including:

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

GRADING AND DRAINAGE PLAN including:

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

EROSION CONTROL

- ☒ Must be in compliance with Technical Manual, Section 5

LANDSCAPE PLAN including:

- ☒ Existing vegetation to be preserved and preservation measures
- ☒ Proposed landscaping and buffers
- ☒ 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

TRANSPORTATION

The following statements are provided in accordance with the Section 14-526 of the ordinance.

TRANSPORTATION

(a) Transportation Standards

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*

1. Impact on Surrounding Street Systems:

The surrounding street system consists of West Commercial Street and points west including the Veterans Bridge/Fore River Parkway. The signalized intersection at Cassidy Point is located approximately 1,100 feet west of the site. Approximately 1,000 feet east of the site includes the signalized Beach Street intersection and access to the Casco Bay Bridge and Commercial Street to the Portland waterfront and Old Port. The development site has approximately 1,400 feet of frontage along West Commercial Street. West Commercial Street contains a 75' to 80' wide right of way with approximately 40' of pavement for two travel lanes and paved shoulders on each side in front of the site. The Canal Landing Boat maintenance facility is located on the opposite side of the street from the development site and the Star Match Building complex, also owned by JB Brown & Sons is located east of the site.

The proposed use is considered consistent with the B-5b zoning district and the objectives identified in various City reports; therefore, we believe it results in no significant impact to the surrounding street system. The site traffic is expected to have a majority of its trip volume originating from the west and will therefore not significantly impact Commercial Street or points east of the site. There will be three primary driveways into the site from West Commercial Street and each will have sight distance in each direction exceeding 500 feet. All three driveways will be unsignalized. The easterly driveway will provide the primary access for staff/employee parking within the 153-space surface parking lot. The staff parking is located on the east side of the building to provide convenient access to the west end of the building, as staff entry is differentiated from patient/visitor access into the building.

The central driveway is the primary patient/visitor access route and it is located between the Clinic building and the garage, to allow for ease of patient access to the Clinic entrance as well as vehicular movement in/out of the garage. The parking garage will be primarily for clinic patient/visitor use and limited use by tenants in the Star Match building during normal business hours. The owner is discussing opportunities for overflow use by the City during off hour periods and storm events. The central driveway contains a single entrance lane and dual exiting lanes for right or left turning movements.

The easterly driveway is located east of the parking garage and will provide access for entering and exiting movement out of the garage. The driveway will also allow for emergency or heavy vehicle movement around the garage and to the rear access drive, thus allowing this infrequent traffic to avoid the central and westerly drives.

Traffic Impact Study

A Traffic Study is underway by Bill Bray of Traffic Solutions and this assessment will include trip generation and accident information for the site and surrounding area. The project will generate 325 AM and 288 PM peak hour trips and thus qualifies for a Traffic Movement Permit. The development team has completed the initial materials for a Scoping meeting and will be pursuing a concurrent review of a Traffic Movement Permit. A copy of the Traffic Movement Permit Application is included with this section.

Any further traffic assessment is subject to the City's peer review.

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*
2. *Access and Circulation:*
- a. *Site Access and Circulation.*
 - (i) Vehicular access to the site will be provided by three primary driveways. The applicant is requesting a waiver of Technical Standard 1.7.2.8 that limits the number of driveways to no more than two (2) for commercial sites, on the basis of the amount of site frontage exceeding 1,400 LF. The proposed driveways will be no less than 300 feet separation.
 - (ii) We believe the primary points of access will not conflict with any existing turning movements on West Commercial Street. Each of the driveways may require dedicated left turn lanes for entering movements from the west. These lanes will not significantly overlap with left turning movements westbound into the Canal Landing Boat facility. The Boat yard has a similar configuration of three (3) driveways onto West Commercial Street, however the central and far westerly driveways are infrequently used and carry limited traffic volumes. The most easterly driveway into the boat yard will be located approximately 250 east of the proposed parking garage. The Canal Landing traffic volumes are also very low and are not expected to be impacted by the traffic associated with the Clinic/Garage development.
 - (iii) Not applicable as there are no drive through features proposed.

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*

2. *Access and Circulation:*

b. *Loading and Servicing:*

- (i) Adequate provisions are made at the site for periodic loading from various size trucks to service the Clinic. A single bay loading dock is positioned at the rear of the building and delivery vehicles will enter the site from the easterly driveway and loop around the rear of the site to access the dock. Trucks will leave the site by maneuvering to the westerly driveway. Similarly, mobile imaging trailers will periodically visit the site and be temporarily parked at the rear of the Clinic. These trailers may need to circulate in a clockwise rotation around the garage which may require occasional travel in an opposite direction of the one-way pattern proposed. Based on the low frequency of this movement, it is considered to be not problematic and may require only very short duration (<5 minutes) assistance from Clinic personnel to assist with traffic control. Turning movement diagrams are contained at the end of this section.

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)*

2. *Access and Circulation:*

c. *Sidewalks:*

- (i) West Commercial Street does not currently have a sidewalk along the site frontage. The project includes the development of a 10' wide pathway along the site frontage, to be developed in accordance with the West Commercial Street Multi-modal Corridor Study. The pathway will be asphalt paved and will involve granite curb placement, an esplanade and the pathway. Linkage to the proposed VA Clinic development will be provided at several locations.

Public Transit (14-526 (a) 3), if applicable

- *Existing available transit services*
- *Proposed site plan design details, such as easement, pad base, and shelter*

3. *Public Transit Access.*

- a. West Commercial Street does not currently fall within a METRO service route, therefore transit service is not directly available at the site. We understand that METRO is currently undertaking an update to their systems and routes and service may be considered along West Commercial Street.
- b. The current development plans include no provisions for a bus shelter at this time, since there is no current service by the site.
- c. Transit service is not available at the site currently.

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*

4. Parking.

- a. *Location and Required Number of Vehicle Parking Spaces.*
- c. *Motorcycles and Scooter Parking.*

- i. The development includes 152 surface parking spaces and 382 spaces within the parking garage. The tenant agreement with the VA requires that 400 spaces be provided for their programing. An additional 132 spaces will be provided in the parking garage and these will be available for use by tenants of the Star Match building. The City Code requires 155 spaces based on a ratio of 1 space/400 SF for a program of 62,300 SF.
- ii. A Transportation Demand Management Plan has not been fully developed yet with the government but we have been advised that the VA does employ a rideshare program, so the applicant is requesting that the submission of a TDM plan be made a condition of approval tied to the issuance of a certificate of occupancy. This will allow the developer and government representatives an opportunity to coordinate the program for the site. We have been advised that VA will promote some TDM strategies including ridesharing and/or bicycle use as much as possible.
- iii. The VA lease agreement requires the developer to provide 400 spaces.
- iv. Parking aisles and dimensions on the existing parking lots meet the applicable standards. This will include 9' x 18' stalls and 24' min. two-way drive aisles and 16' wide one-way drives
- v. All new surface parking shall be paved. Porous pavement is proposed for much of the surface parking field.

The site plan has been developed to allow safe passage and parking for motorcycles and scooters within the surface parking lots and parking garage.

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)*

4. Parking.

- b. *Location and Required Number of Bicycle Parking Spaces.*

The site plan contains multiple bike racks positioned on the site for use by staff and visitors. A capacity for up to 20 bikes will be provided on the site.

The applicant is requesting a waiver of the required number of bicycle parking spaces as that would exceed well over 35 bike spaces which is considered excessive for the Clinic use.

Snow Storage (14-526 (a) 4 d)

- *Management plan for snow removal and locate snow storage areas on plans*

4. *Parking.***d. *Snow Storage.***

- i. The site plans include multiple locations for the placement of snow.
- ii. The applicant will provide snow removal on the pedestrian walks across the site and will remove snow as necessary to avoid displacement of any onsite parking.

Traffic Demand Management (TDM) (14-526 (a) 5), if applicable

- *Develop TDM with Trip Reduction Targets and Strategies*

5. *Transportation Demand Management (TDM).*

- a. The applicant is currently reviewing the requirements of a TDM plan with the VA tenant representatives to determine what strategies may be employed on the development.

TRAFFIC MOVEMENT PERMIT APPLICATION

FOR PROPOSED

Department of Veterans Affairs

Community Based Outpatient Clinic

PREPARED FOR: J.B. Brown & Sons

PREPARED BY: William J. Bray, PE

December 2019

Provisionally Adopted 1/10/00

Department of Transportation
Traffic Engineering Division
16 State House Station
Augusta, Maine 04333
Telephone: 207-287-3775

FOR MDOT USE
ID #

1/2000

Total Fees:
Date Received:

**PERMIT APPLICATION – TRAFFIC
TRAFFIC MOVEMENT PERMIT, 23 M.R.S.A. § 704 – A**

Please type or print:

This application is for:

Traffic 100-200 PCE's _____
Traffic 200 + PC-E's X

Name of Applicant: FDS JBB Portland, LLC

Address: 10 Free Street, Portland, Maine 04101 Telephone: (207) 774-5908

Name of local contact or agent: William J. Bray, P.E., Traffic Solutions

Address: 17 Mountview Drive, Gorham, Maine 04038

Telephone: (207) 400-6890

Name and type of development: Community Based Outpatient Clinic

Location of development including road, street, or nearest route number: 113 West Commercial Street, Portland, Maine

City: Portland, County: Cumberland, Tax Map 060 Block A001 Lot 001

Do you want a consolidated review with DEP pursuant to 23 M.R.S.A. § 704-A (7)? Yes _____ No X

Was this development started prior to obtaining a traffic permit? No

Is the project located in an area designated as a growth area (as defined in M.R.S.A. title 30 – A, chapter 187)?
Yes, X No _____

Is this project located within a compact area of an urban compact municipality? Yes: X No _____

Is this development or any portion of the site currently subject to state or municipal enforcement action? No

Existing DEP or MDOT permit number (if applicable): _____

Name(s) of DOT staff person(s) contacted concerning this application:

Name(s) of DOT staff person(s) present at the scoping meeting for 200+ applications: _____

NOTICE OF INTENT TO FILE

Please take notice that:

FDS JBB Portland, LLC

Is intending to file a Maine Department of Transportation Traffic Movement Permit application with the City of Portland under their delegated review authority pursuant to the provisions of 23 M.R.S.A. § 704-A on or about

December 6, 2019

The application is for:

A 62,170 square foot building with on-site parking capacity of 532 plus spaces. The Department of Veterans Affairs will lease the proposed site creating a Community Based Outpatient Clinic. The proposed project will generate a total of 229 trips during the weekday morning and 204 trips during the evening peak hours of the street.

At the following location: **113 West Commercial Street, Portland, Maine**

A request for a public hearing must be received by the City, in writing, no later than 20 days after the application is found by the City to be complete and is accepted for processing. Public comment on the application will be accepted throughout the processing of the application.

The application will be filed for public inspection at the City of Portland's Planning and Urban Development Office, during normal working hours. A copy of the application may also be seen at the municipal offices in:

Written public comments may be sent to the Department of Transportation, Traffic Engineering Division, 16 State House Station, Augusta, Maine 04333.

1/2000

CERTIFICATION

The traffic engineer responsible for preparing this application and/or attaching pertinent site and traffic information hereto, by signing below, certifies that the application for traffic approval is complete and accurate to the best of his/her knowledge.

Signature: William Bray Re/Cert/Lic No.: 4907

Name (print): William Bray

Date: 12-1-2019



If the signature below is not the applicant's signature, attach letter of agent authorization signed by applicant.

"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 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. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

V. P. V. V.

Signature of applicant

12/3/2019

Date

Direct Abutters List
Proposed VA Clinic
West Commercial Street - Portland, ME
JN 3572

SUBJECT PARCEL:

060 / A001-001 (113 W. Commercial St)

JB Brown + Sons
PO Box 207
Portland, ME 04112

ABUTTERS:

057 / F001-001 (284 Danforth St)

Portland Housing Authority
14 Baxter Boulevard
Portland, ME 04101

060 / C001-001 (Emery St)

JB Brown + Sons
PO Box 207
Portland, ME 04102

060 / C002-001 (120 Salem St)

Joshua J. Soley
120 Salem Street
Portland, ME 04102

060 / D001 (W Commercial St)

JB Brown + Sons
PO Box 207
Portland, ME 04102

060 / D002 (Emery St)

JB Brown + Sons
PO Box 207
Portland, ME 04102

060 / F001-001 (232 W Commercial St)

New Yard, LLC
400 Commercial Street
Portland, ME 04101

061 / H001-001 (362 Danforth St)

Susan J. Noonan
362 Danforth Street
Portland, ME 04102

061 / H002-001 (358 Danforth St)

Devens M. Hamlen / Samar Post Jamali JTS
358 Danforth Street
Portland, ME 04102

061 / H003-001 (336 Danforth St)

Sonia B. Robertson
336 Danforth Street
Portland, ME 04102

061 / H004-001 (320 Danforth St)

Thomas R. Robinson / Laura C. Robinson
320 Danforth Street
Portland, ME 04102

061 / H005-001 (314 Danforth St)

Mark Bessire / Aimee Bessire JTS
314 Danforth Street
Portland, ME 04102

061 / H007-001 (308 Danforth St)

Christa Vo / Troung Vo
308 Danforth Street
Portland, ME 04102

**Direct Abutters List
Proposed VA Clinic
West Commercial Street - Portland, ME
JN 3572**

061 / H008-001 (300 Danforth St)

Frances Dyro
300 Danforth Street
Portland, ME 04102

061 / H009-001 (342 Danforth St)

Michael Bruenjes / Judith Bruenjes
342 Danforth Street
Portland, ME 04102

061 / H010-001 (346 Danforth St)

George R. Moberg / Elizabeth J. Moberg
346 Danforth Street
Portland, ME 04102

061 / H011-001 (350 Danforth St)

Sarah P. Daignault Trustee
350 Danforth Street
Portland, ME 04102

061 / H012-001 (354 Danforth St)

Michael R. Curtis / Margaret T. Curtis JTS
354 Danforth Street
Portland, ME 04102

061 / H018-001 (34 Emery St)

Stephen Dyro
34 Emery Street
Portland, ME 04102

061 / I001-001 (400 Danforth St)

Marjorie R. Shaw
400 Danforth Street
Portland, ME 04102

061 / I002-001 (394 Danforth St)

Sean G. Murphy / Colleen D. Katana JTS
394 Danforth Street
Portland, ME 04102

061 / I003-001 (380 Danforth St)

Andrew Butcher / Julie Beth Pezzino JTS
380 Danforth Street
Portland, ME 04102

061 / I004-001 (370 Danforth St)

Deborah J. Kruk
370 Danforth Street
Portland, ME 04102

061 / I006-002 (382 Danforth St)

Constance Bloomfield / William McFarlane JTS
382 Danforth Street - #2
Portland, ME 04102

071 / C001-001 (404 Danforth St)

Marjorie R. Shaw
400 Danforth Street
Portland, ME 04102

071 / C002-002 (235 W Commercial St)

Marc Paradis
16 Lawn Avenue
Old Orchard Beach, ME 04064

071 / F002 (W. Commercial St)

New Yard, LLC
400 Commercial Street
Portland, ME 04101

SECTION 1

A. SITE PLAN

The Applicant is proposing to construct a 62,170 square foot two-story building on the 8.40-acre site located at 113 West Commercial Street. The Federal Department of Veterans Affairs (VA) will lease the proposed building creating a Community Based Outpatient Clinic. The proposed development includes a total of 532 on-site parking spaces with 150 surface parking spaces and 382 spaces within a three-level garage structure. The VA's lease agreement requires the applicant to provide a total of 400 on-site parking spaces to meet their programming needs. The remaining 132 parking spaces will be assigned to tenants within the adjacent Star Match building to accommodate both short and long-term parking requirements.

There will be three primary driveways into the site from West Commercial Street. All three driveways are proposed to be unsignalized. The westerly driveway will provide the primary access for staff/employees to the 150-space surface parking lot. Staff parking is located on the westside of the building to provide convenient access to the proposed building, as staff entry is differentiated from patient/visitor access into the building. The central driveway is the primary patient/visitor access route and it is located between the clinic building and the proposed site garage to allow for ease of patient access to the clinic building, as well as, vehicular movements in/out of the garage. The most easterly driveway is located east of the parking structure and will provide access for entering and exiting movements out of the garage. The driveway also provides for emergency and heavy vehicle movements around the garage and to the rear of the parking structure avoiding conflicts with other site uses through the westerly and central access driveways.

It is expected that each of the three driveways will require dedicated left-turn lanes for entry movements to the site from West Commercial Street. These lanes and the projected volumes of traffic through them are not expected significantly overlap with left-turn movements into the Canal Landing Boat facility. The Canal Landing site design also provides three points of access onto West Commercial Street with the central and far westerly driveways infrequently used and carrying limited traffic volumes. The most easterly driveway into the boat yard is located approximately 250-feet east of the proposed parking garage. The Canal Landing traffic volumes are very low and are not expected to conflict with traffic generated by the proposed Clinic site.

SECTION 1

B. EXISTING AND PROPOSED SITE USES

The existing 8.40-acre parcel is unencumbered by existing structures for preservation, reuse or demolition. An abandoned rail spur exists on the site without any record easement found. The developable portion of the site has approximately 5.17 acres of land area with a total 1,400-feet of street frontage on West Commercial Street.

The Applicant is proposing to construct a 62,170 square foot two-story building on the 8.40-acre site located at 113 West Commercial Street. The Federal Department of Veterans Affairs (VA) will lease the proposed building creating a Community Based Outpatient Clinic. The proposed development includes a total of 532 on-site parking spaces with 150 surface parking spaces and 382 spaces within a three-level garage structure. The VA's lease agreement requires the applicant to provide a total of 400 on-site parking spaces to meet their programming needs. The remaining 132 parking spaces will be assigned to tenants within the adjacent Star Match building to accommodate both short and long-term parking requirements.

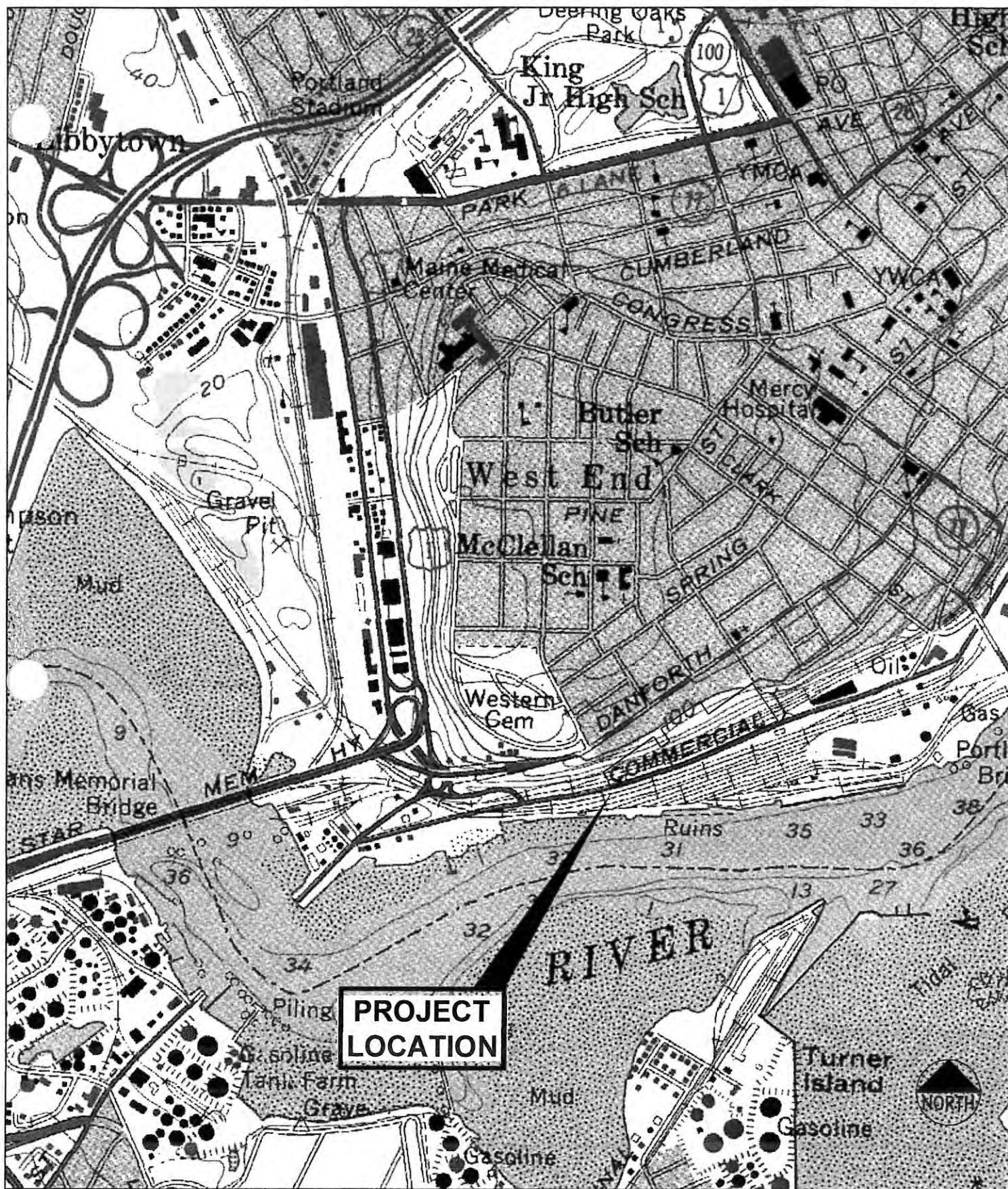
There will be three primary driveways into the site from West Commercial Street. All three driveways are proposed to be unsignalized. The westerly driveway will provide the primary access for staff/employees to the 150-space surface parking lot. Staff parking is located on the westside of the building to provide convenient access to the proposed building, as staff entry is differentiated from patient/visitor access into the building. The central driveway is the primary patient/visitor access route and it is located between the clinic building and the proposed site garage to allow for ease of patient access to the clinic building, as well as, vehicular movements in/out of the garage. The most easterly driveway is located east of the parking structure and will provide access for entering and exiting movements out of the garage. The driveway also provides for emergency and heavy vehicle movements around the garage and to the rear of the parking structure avoiding conflicts with other site access through the westerly and central access driveways.

It is expected that each of the three driveways will require dedicated left-turn lanes for entry movements to the site from West Commercial Street. These lanes and the projected volumes of traffic through them are not expected to significantly overlap with left-turn movements into the Canal Landing Boat facility. The Canal Landing site design also provides three points of access onto West Commercial Street with the central and far westerly driveways infrequently used and carrying limited traffic volumes. The most easterly driveway into the boat yard is located approximately 250-feet east of the proposed parking garage. The Canal Landing traffic volumes are very low and are not expected to conflict with traffic generated by the proposed Clinic site.

SECTION 1

C. SITE AND VICINITY BOUNDARIES

The attached U.S.G.S. Map shows the proposed project site located in the City of Portland.



U.S.G.S. Location Map

VA Clinic, West Commercial Street, Portland, Maine

U.S.G.S. Portland West, State-7.5 Minute Series (Topographic)

Design: JTA

Date: NOV 2019

Draft: CDD

Job No.: 3572

Checked: SRB

Scale: N.T.S.

File Name: 3572-DEP FIG.dwg



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Figure

1

SECTION 1

D. PROPOSED USES IN THE GENERAL VICINITY OF THE PROPOSED DEVELOPMENT

Traffic generated by projects that have been approved by the Local Planning Board and/or the Maine Department of Transportation, yet are not opened, must be included in the estimate of pre-development traffic. Development projects listed in the recently completed September 2019 Traffic Impact Study for Portland Square Redevelopment will be included in the estimate of background traffic for the proposed Community Based Outpatient Clinic site. Trip generation estimates will be prepared for each listed project and included as background traffic in all future traffic analysis.

*383 Commercial Street
Canal Landing
184 Commercial Street
Eastern Waterfront TMP
58 Fore Street
Portland Square Redevelopment*

SECTION 1

E. TRIP GENERATION

Site Trip Generation - Community Based Outpatient Clinic: Trip generation for the proposed Veterans Affairs Clinic project is based upon tables presented in the 10th edition^(a) of the Institute of Transportation's Engineers "TRIP GENERATION" manual. The following trip rates were applied in that effort:

Land-Use Code 630 – Clinic [62,170 square foot building]

Weekday Street Peak Hour – AM Peak	= 3.69 trips/1,000sf
Weekday Street Peak Hour – PM Peak	= 3.28 trips/1,000sf
Weekday Peak Hour of Site – AM Peak	= 5.22 trips/1,000sf
Weekday Peak Hour of Site – PM Peak	= 4.64 trips/1,000sf

- (1) **NOTE:** MaineDOT requires the use of trip tables presented in the 7th edition of the ITE publication for estimating all trip generation for development projects requiring a Traffic Movement Permit. The earlier publication provides very minimal peak hour trip generation data for a clinic site; as a result, trip data in the 10th edition was applied. To confirm the appropriateness of the 10th edition trip rates, peak hour surveys were conducted at a local Veterans Administration site located at 655 U.S. Route 1 in the City of Saco. A summary of the local data is highlighted on the following page.

Table 1, below, provides a summary of the trip generation for the proposed Community Based Outpatient Clinic project:

Table 1
Peak Hour Trip Generation Summary

<u>Peak Hour Time Period</u>	<u>Peak Hour Trip Generation</u>
AM Peak Hour (Street)	229 trips
PM Peak Hour (Street)	204 trips
AM Peak Hour (Generator)	325 trips
PM Peak Hour (Generator)	288 trips

As highlighted in the preceding Table 1, the proposed Veterans Administration's Community Based Outpatient Clinic (CBOC) development is expected to generate a total of **229** trips during the morning street peak hour and a slightly less volume of trips (**204** trips) in the evening peak hour of the street. Site trip projections for both the morning and afternoon peak hours of the clinic site are somewhat higher at 325 trips mid-morning, of a typical weekday and 288 trips mid-afternoon of the proposed site.

Clinic (630)

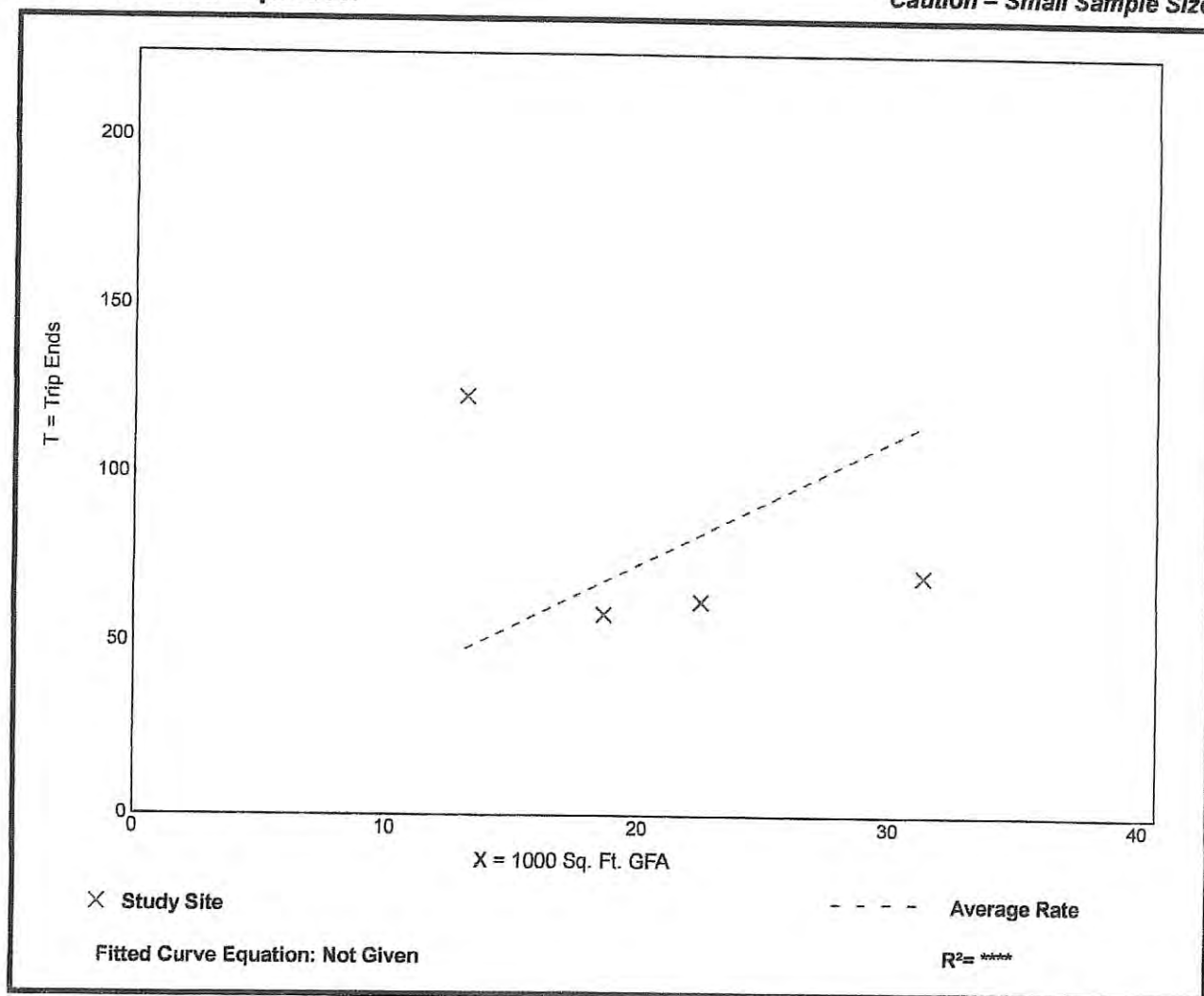
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 4
 1000 Sq. Ft. GFA: 21
 Directional Distribution: 78% entering, 22% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.69	2.27 - 9.36	2.82

Data Plot and Equation

Caution – Small Sample Size



Clinic (630)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 5

1000 Sq. Ft. GFA: 18

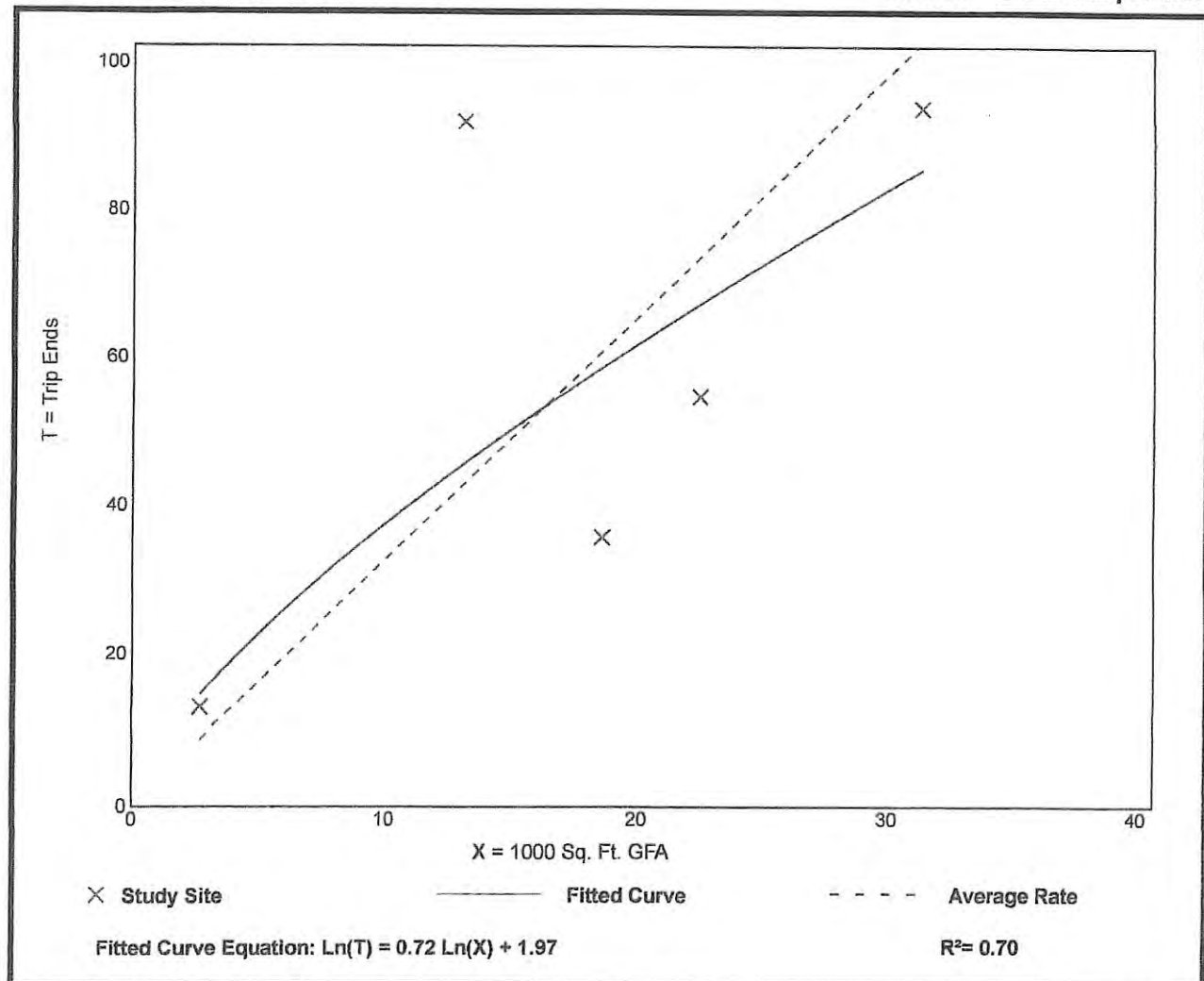
Directional Distribution: 29% entering, 71% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.28	1.93 - 7.00	1.84

Data Plot and Equation

Caution – Small Sample Size



Clinic (630)

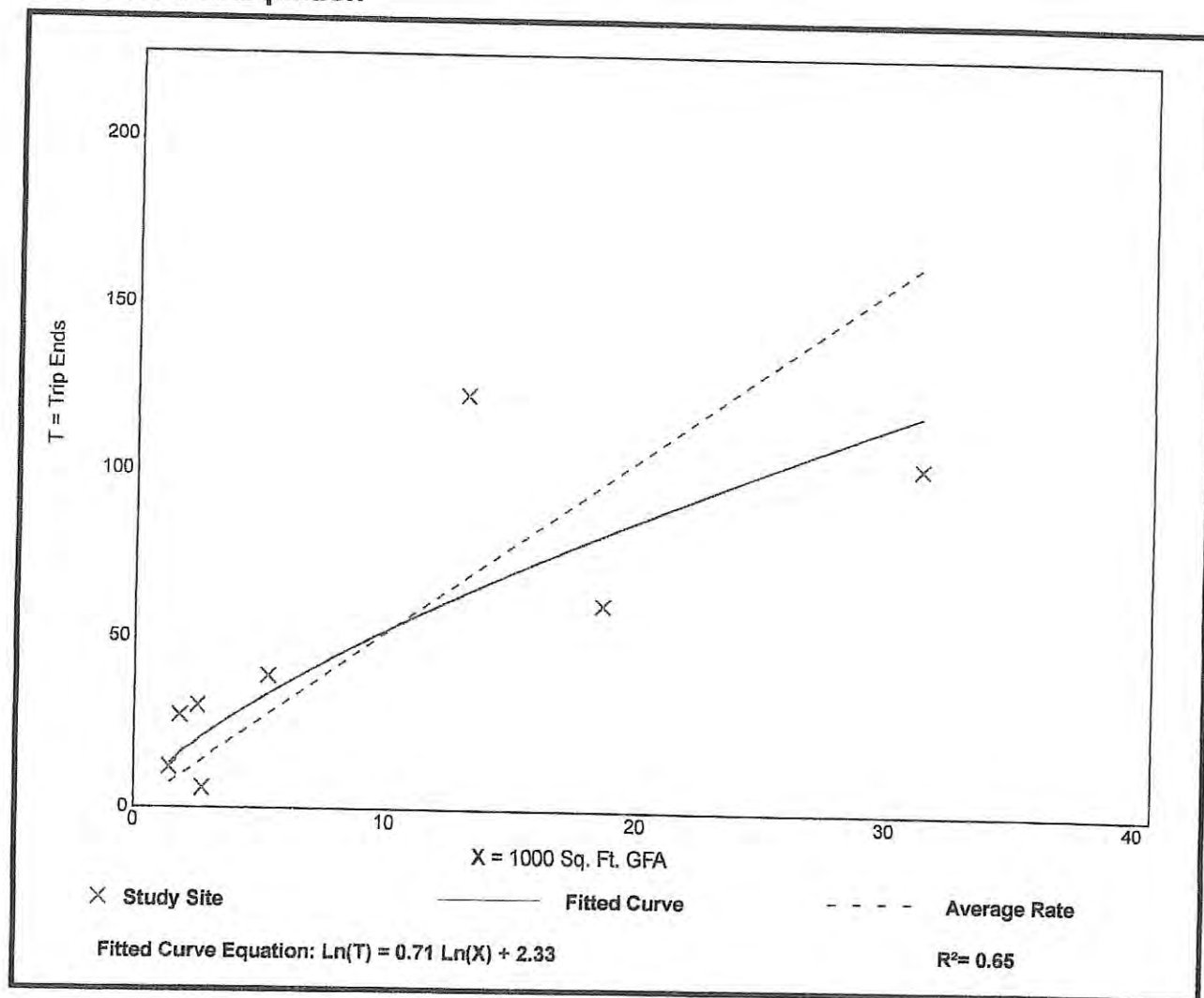
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 8
1000 Sq. Ft. GFA: 10
Directional Distribution: 58% entering, 42% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
5.22	2.22 - 15.00	3.37

Data Plot and Equation



Clinic (630)

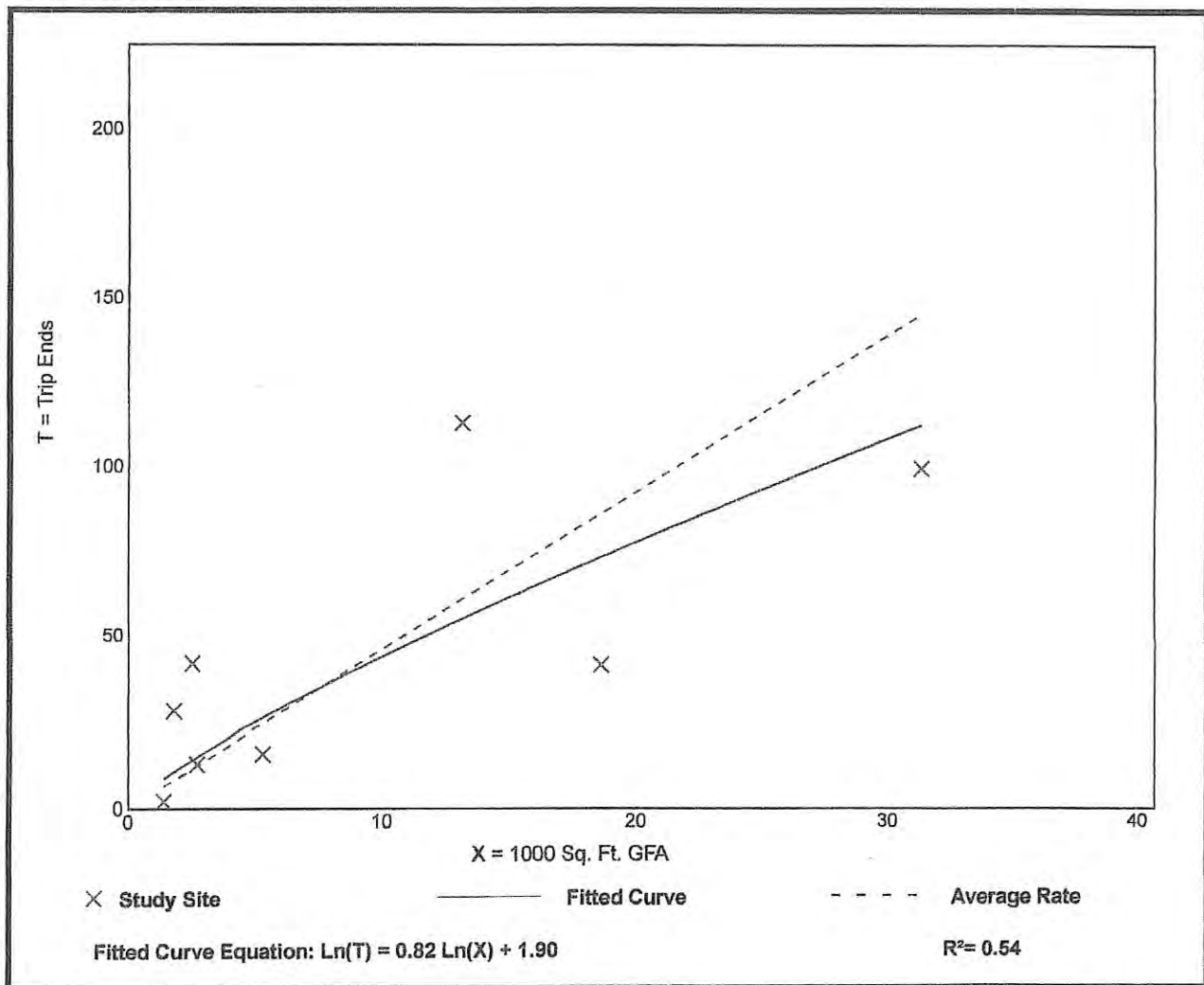
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 8
1000 Sq. Ft. GFA: 10
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.64	1.43 - 16.80	3.84

Data Plot and Equation



VA Clinic Study - Saco

Saco VA Office			Date	9/10/2019	Weather	Sunny	
----------------	--	--	------	-----------	---------	-------	--

Quick Care

VA Office

Morning Count Occupied Spaces:

11

1

	IN		OUT			IN		OUT	
7:00-7:15	8		2		7:00-7:15	2		1	3
7:15-7:30	3		1		7:15-7:30	3			3
7:30-7:45	5				7:30-7:45	8		1	9
7:45-8:00	10		1		7:45-8:00	5		4	9
8:00-8:15	12		4		8:00-8:15	4		3	7
8:15-8:30	6		2		8:15-8:30	8		7	15
8:30-8:45	3		3		8:30-8:45	5		4	9
8:45-9:00	8		4		8:45-9:00	2		6	8
Occupied Spaces:				57	Occupied Spaces:				2

40

Afternoon Count Occupied Spaces: 54 Afternoon Count Occupied Spaces 11

	IN		OUT			IN		OUT	
2:00-2:15	5		4		2:00-2:15	3		6	9
2:15-2:30	5		2		2:15-2:30			2	2
2:30-2:45	3		3		2:30-2:45	1		1	2
2:45-3:00	2		5		2:45-3:00			1	1
3:00-3:15	8		9		3:00-3:15	2		2	4
3:15-3:30	3		6		3:15-3:30			3	3
3:30-3:45	2		5		3:30-3:45	1		5	6
3:45-4:00	1		4		3:45-4:00			4	4
4:00-4:15	2		3		4:00-4:15	1		1	2
4:15-4:30	2		7		4:15-4:30	1		2	3
4:30-4:45	2		6		4:30-4:45			1	1

17

Occupied Space

29

1

*VA Office is on the second floor of the building.

Both facilities open at 8 AM.

VA Office closes at 4:30PM

Saco VA Clinic

10,798 SF

$$40 \div \frac{10,798}{1000} = 3.70 \text{ trips/1000}$$

$$17 \div \frac{10,798}{1000} = 1.57 \text{ trips/1000}$$

SECTION 1

F. TRIP COMPOSITION

Vehicle Trip Composition: This report has assumed all vehicle trips generated by the proposed project are “*primary*” or “*new*” vehicle trips to the area street network.

SECTION 1

G. TRIP DISTRIBUTION

Site Trip Distribution: The 10th Edition of the Institute of Transportation Engineers **TRIP GENERATION** publication provides the following trip distributions rates for a proposed Clinic building:

Land-Use Code 630 – Clinic

AM Peak Hour Street)	= 78% enter/22% exit
PM Peak Hour (Street)	= 29% enter/71% exit
AM Peak Hour (Generator)	= 58% enter/42% exit
PM Peak Hour (Generator)	= 46% enter/54% exit

Table 1, as follows, summarizes the peak hour directional distributional volumes for the proposed CBOC site:

Table 1
Site Trip Distribution Summary

<u>Peak Hour Time period</u>	<u>CBOC Building Trip Distribution Volumes</u>		<u>Total Trips</u>
	<u>Enter</u>	<u>Exit</u>	
AM Peak Hour (Street)	179 trips	50 trips	229 trips
PM Peak Hour (Street)	59 trips	145 trips	204 trips
AM Peak Hour (Generator)	189 trips	136 trips	325 trips
PM Peak Hour (Generator)	132 trips	156 trips	288 trips

Accordingly, in the morning peak hour of the street the heaviest volume of trips (179 trips) enters the site and in the evening peak hour a reverse pattern occurs with 145 trips exiting the site. The remaining trips (50 trips) in the morning peak hour will exit the site and (59 trips) in the evening peak hour enters the site.

Projected trip patterns occurring during the mid-morning and mid-afternoon peak hours of the site are estimated at 189 trips entering the site in the mid-morning peak hour and 156 trips exiting the site in the mid-afternoon peak hour. The remaining balance of 136 trips in the morning peak hour exits the site and the remaining trips (132 trips) in the afternoon peak hour enters the site.

SECTION 1

H. TRIP ASSIGNMENT

Vehicle Trip Assignment: The Department of Veterans Affairs provided general residency information for employees presently working at the 144 Fore Street facility in the City of Portland that shows the majority of employees reside in Portland, South Portland, Yarmouth and Falmouth. They also stated the expected service area of the proposed clinic will encompass the majority of Cumberland and York counties. A trip assignment model, based upon 2018 population trends for the major communities in Cumberland County, was developed and applied in the assignment of the site trips to the West Commercial Street corridor. This process expects approximately 85% of the site trips, which include both patients and staff trips, will arrive/depart the proposed site with a westerly orientation along West Commercial Street. The remaining site trips (15%) will travel to/from the east on West Commercial Street to reach points in the eastern section of the Portland Peninsular and/or cross the Casco Bay Bridge to either Cape Elizabeth or the eastern section of the City of South Portland.

Site trips traveling to/from the west of the proposed 113 West Commercial Street site were further assigned to the roadway system based upon existing traffic data gathered at both the West Commercial Street/Valley Street and West Commercial Street/Fore River Parkway intersections. Copies of the traffic data are attached.

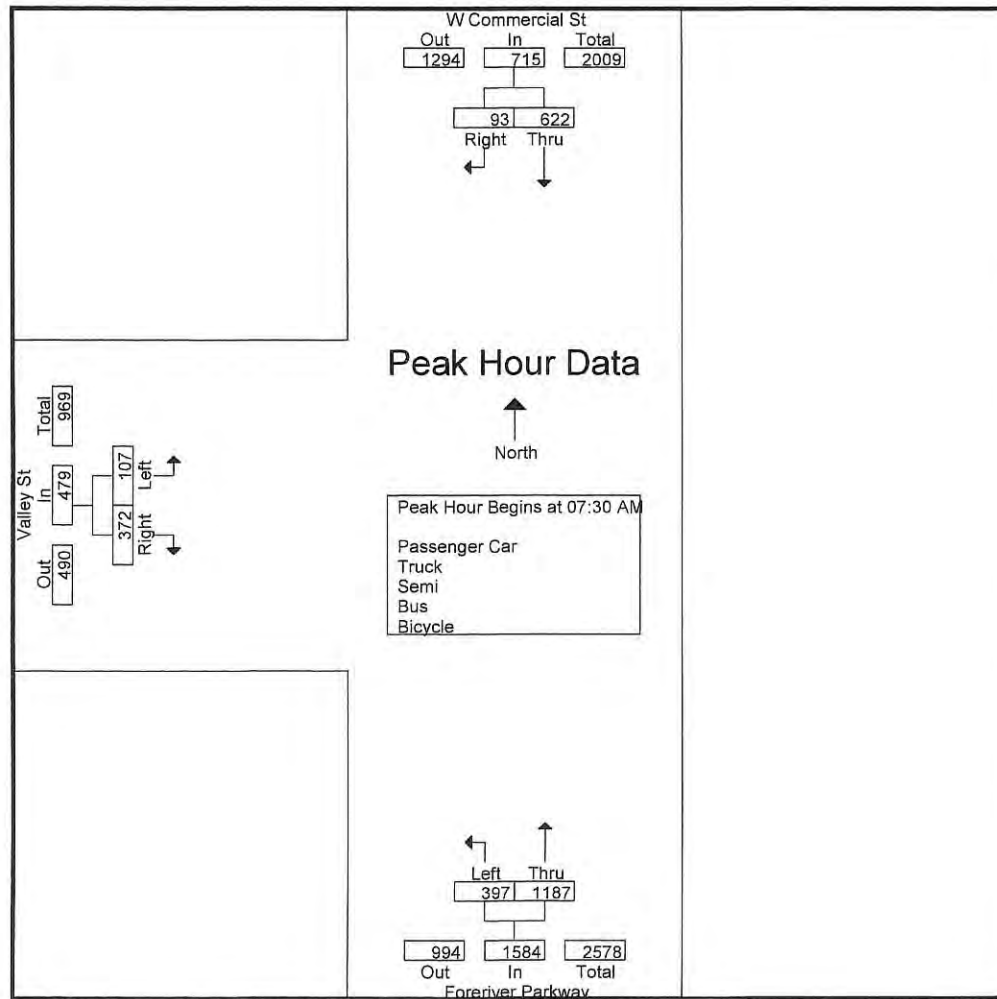
Figures 1 and 2 illustratively present traffic assignments, respectively, for the morning and evening peak hours of the street.

Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland Foreriver, Valley & WCommercial
August 15, 2019 AM
Sunny
Count by Jen Gilbert

File Name : Portland Fore River Parkway, Valley St & W Commerical St 8-15-19 AM
Site Code : 00815191
Start Date : 8/15/2019
Page No : 6

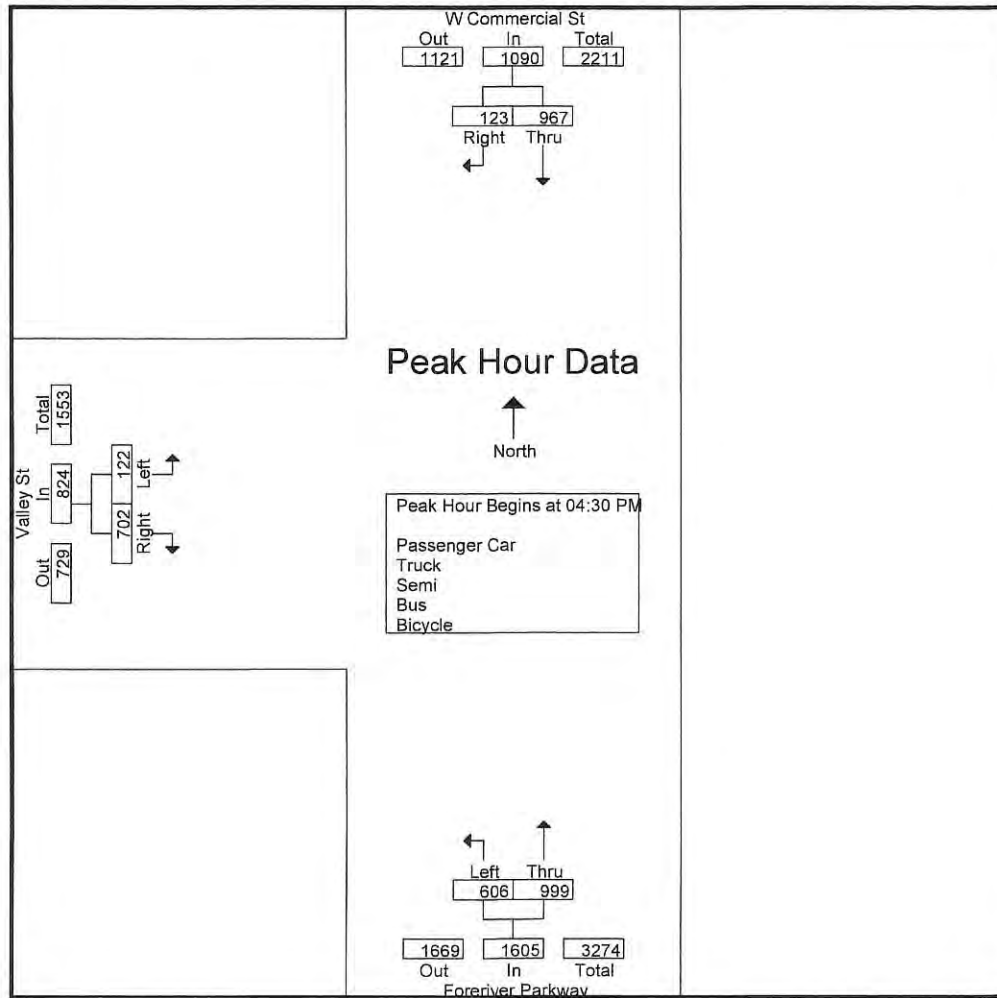


Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland Fore River, Valley & WCommerical
August 15, 2019 PM
Sunny
Count by Jen Gilbert

File Name : Portland Fore River Parkway, Valley St & W Commerical St 8-15-19 PM
Site Code : 00815192
Start Date : 8/15/2019
Page No : 6

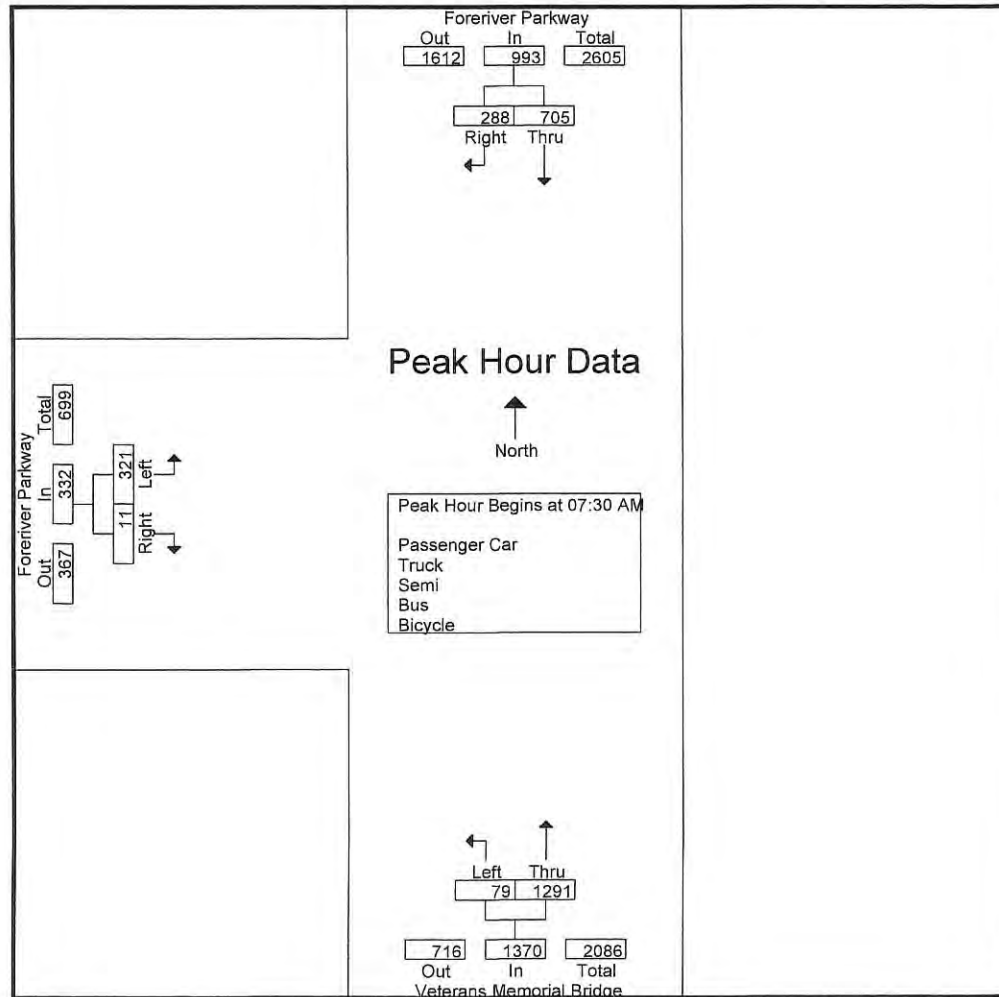


Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland Foreriver Parkway & Memorial Br
August 14, 2019 AM
Sunny
Count by Jen Gilbert

File Name : Portland Foreriver Parkway & Veterans Memorial Brid
Site Code : 00814191
Start Date : 8/14/2019
Page No : 6

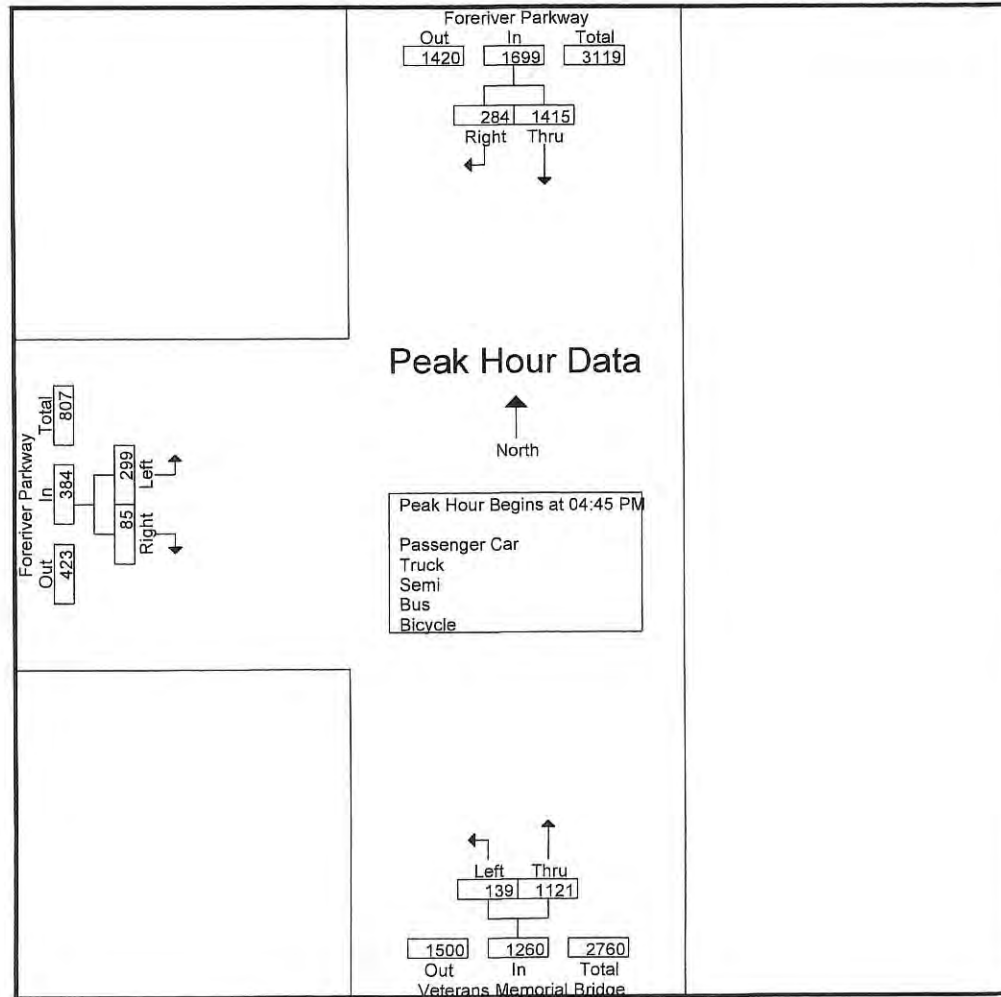


Traffic Solutions

17 Mountview Drive
Gorham, ME 04038

Portland Foreriver Parkway & Memorial Br
August 14, 2019 PM
Sunny
Count by Jen Gilbert

File Name : Portland Foreriver Parkway & Veterans Memorial Bridge 8-14-19 PM
Site Code : 00814192
Start Date : 8/14/2019
Page No : 6

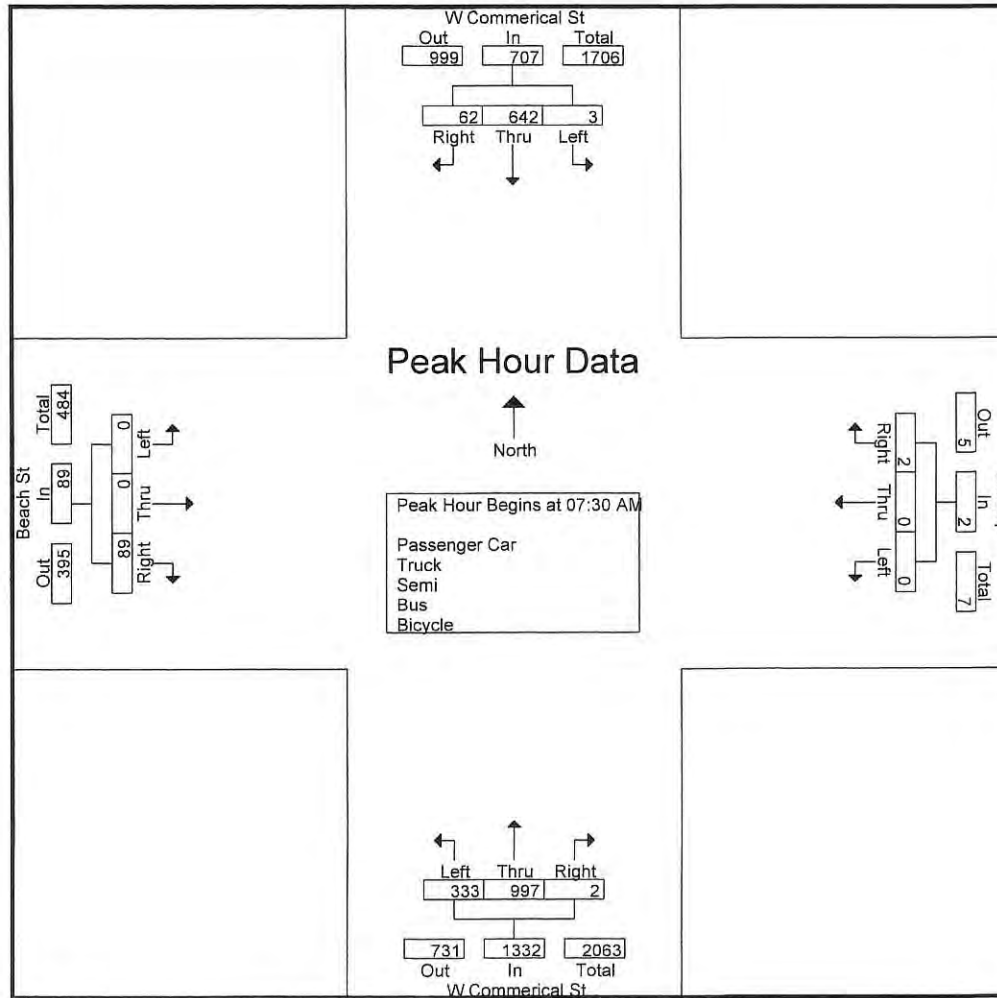


Traffic Solutions

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 : 6

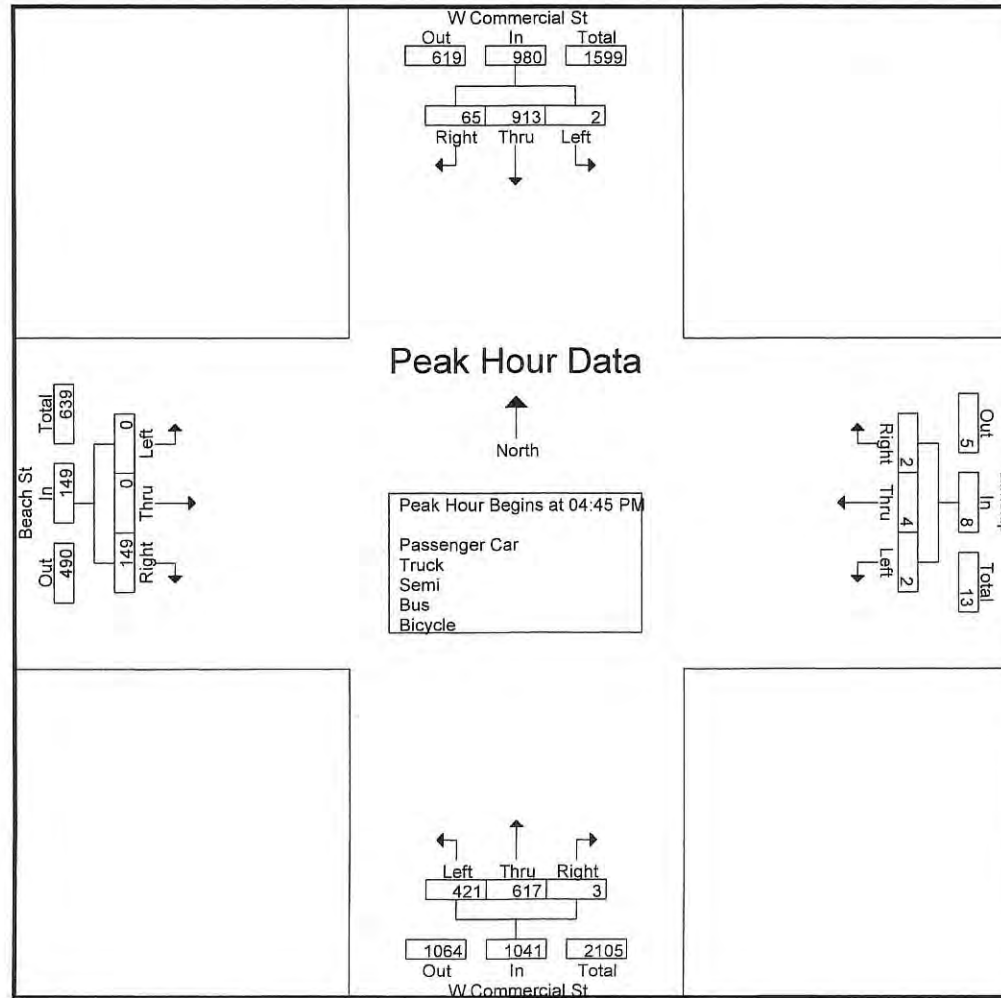


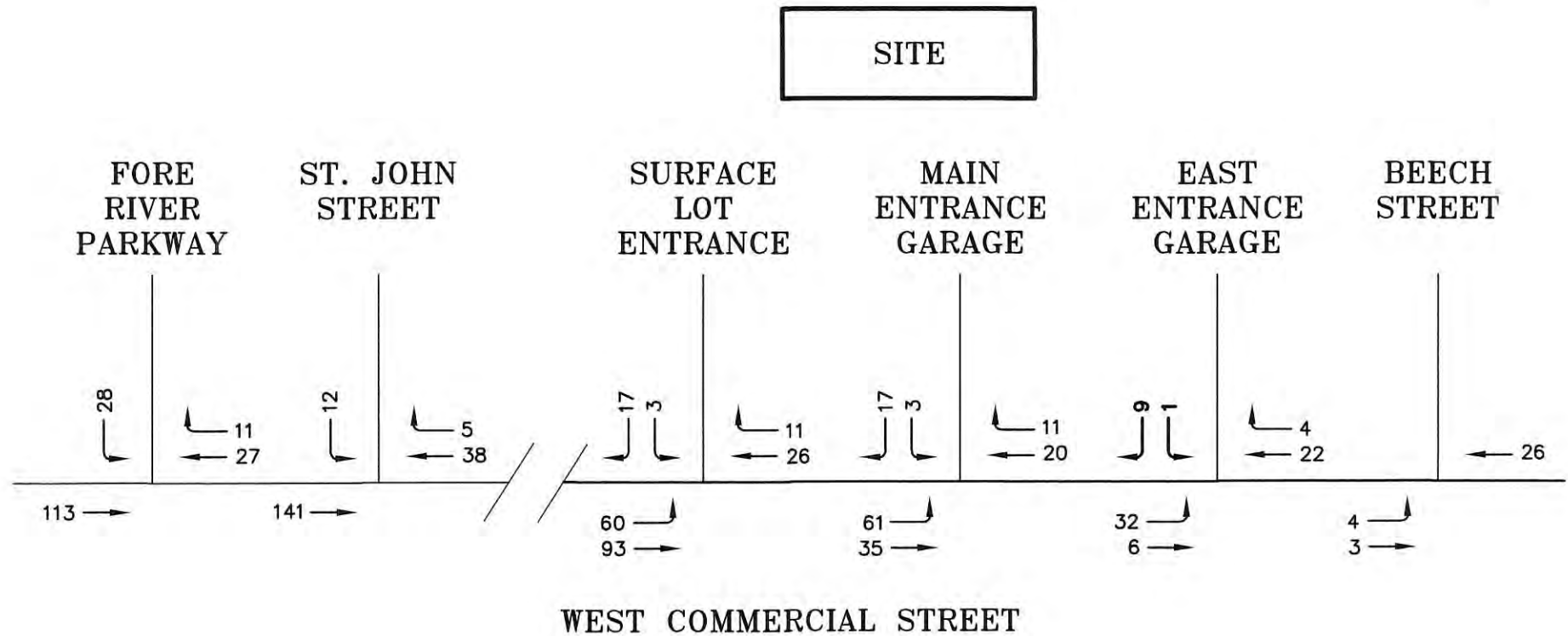
Traffic Solutions

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 : 6

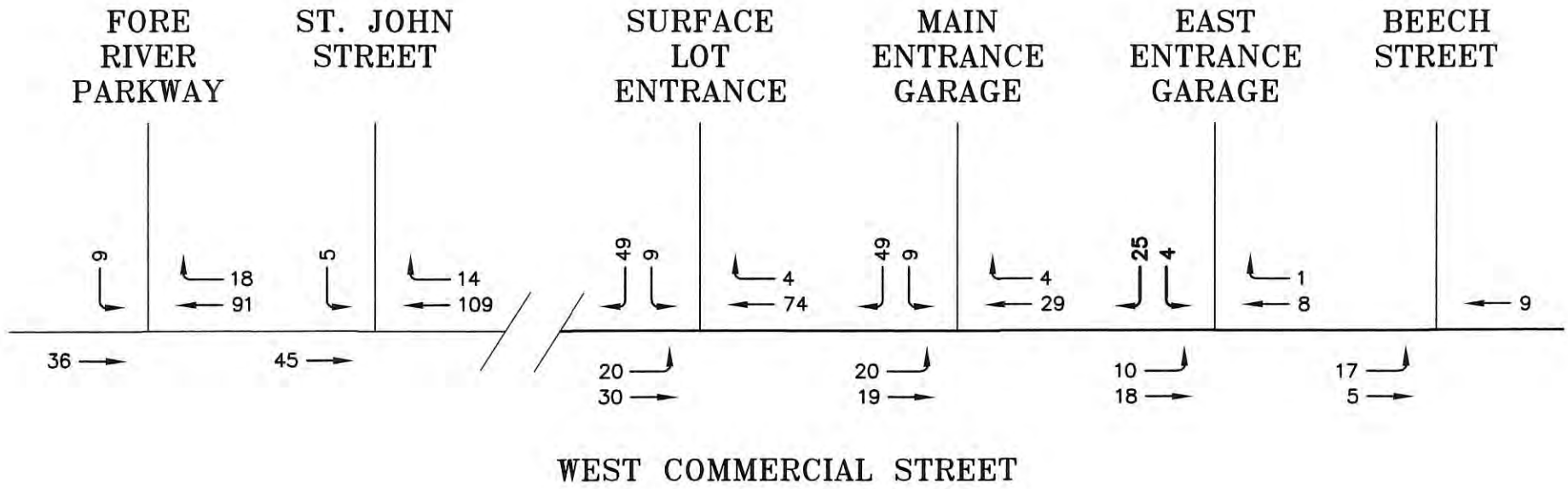




**CLINIC SITE TRIP ASSIGNMENT
AM PEAK HOUR
FIGURE 1**



SITE



CLINIC SITE TRIP ASSIGNMENT
PM PEAK HOUR
FIGURE 2

SECTION 2

TRAFFIC ACCIDENTS

MaineDOT's Accident Records Section provided the latest three-year (2016 through 2018) crash data for the section of West Commercial Street between Beach Street and the Fore River Parkway, a distance of 1.40 miles. MaineDOT's report is presented as follows:

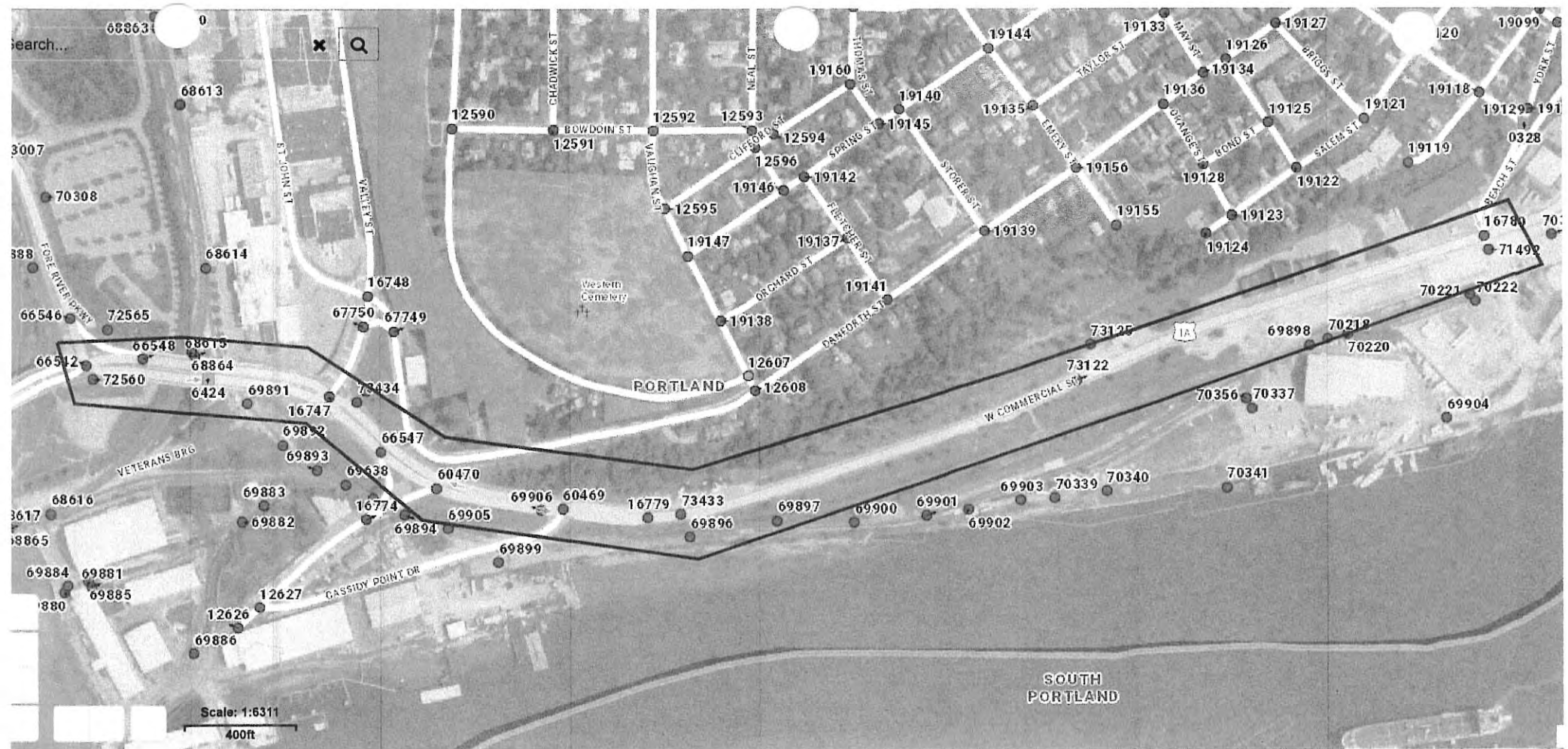
2016 -2018 Traffic Accident Summary

<u>Location</u>	<u>Total Crashes</u>	<u>Critical Rate Factor</u>
1. West Commercial Street @ Valley Street	26	0.75
2. West Commercial Street @ Beach Street	30	1.17
3. West Commercial Street @ Cassidy Point Drive	5	0.37
4. West Commercial Street btw. Fore River Parkway and Valley Street	3	0.29
5. West Commercial Street btw. Valley Street and Cassidy Point Drive	1	0.27
6. West Commercial Street near Benny's Diner	2	0.65
7. West Commercial Street btw. gravel turnout and Beach Street	12	0.51

The MaineDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:

- ***8 or more accidents***
- ***A Critical Rate Factor greater than 1.00***

As the data presented in the table shows, the intersection of West Commercial Street and Beach Street meets both MaineDOT's criteria for identification of a high crash location, with a total of 30 crashes and a corresponding critical rate factor of 1.17. MaineDOT provided a detailed vehicle collision diagram for the intersection that maps the crash patterns of each of the 30 vehicle collisions. That document visually presents two very distinct crash patterns occurring within the intersection; 18 crashes are "rear-end" crashes involving through vehicles on both approaches of West Commercial Street colliding with a second vehicle traveling in the same direction. A second crash pattern were "angle" collisions with a total of four incidences involving a motorist turning left from the eastbound approach of West Commercial Street to Beach Street stuck by a thru vehicle traveling westbound through the intersection.



Crash Summary port

Report Selections and Input Parameters

REPORT SELECTIONS

☒ Crash Summary I ☐ Section Detail ☒ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Portland: Rte 1/W Commercial St from intersection with Fore River Pkwy/Veterans Bridge (node 66542) to intersection with Beach St (node 16780)

REPORT PARAMETERS

Year 2016, Start Month 1 through Year 2018 End Month: 12

Route: 0001A	Start Node: 66542 End Node: 16780	Start Offset: 0 End Offset: 0	☐ Exclude First Node ☐ Exclude Last Node
Route: 001AS	Start Node: 16779 End Node: 60469	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node
Route: 001AS	Start Node: 60469 End Node: 16747	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node
Route: 001AS	Start Node: 16747 End Node: 66542	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node

Crash Summary I

Nodes														
Node	Route - MP	Node Description	U/R	Total Crashes	Injury	Crashes	Percent Annual M			Crash Rate	Critical Rate	CRF		
					K	A	B	C	PD	Injury	Ent-Veh			
16747	0001A - 9.86	Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST	9	26	0	1	2	4	19	26.9	10.594	0.82	1.10	0.00
												Statewide Crash Rate:	0.73	
16780	0001A - 10.69	Int of BEACH ST ENT TO PORTLAND YACHT RAMP BEACH	9	30	1	0	2	9	18	40.0	7.273	1.37	1.18	1.17
												Statewide Crash Rate:	0.73	
16779	0001A - 10.10	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	7.676	0.00	0.34	0.00
												Statewide Crash Rate:	0.15	
66547	0001A - 9.91	Int of CASSIDY POINT DR W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	4.020	0.00	0.40	0.00
												Statewide Crash Rate:	0.15	
73122	0001A - 10.40	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.818	0.00	0.40	0.00
												Statewide Crash Rate:	0.15	
66542	0001A - 9.70	Int of FORE RIVER PKY VETERANS BRIDGE	9	12	0	0	0	1	11	8.3	9.466	0.42	1.13	0.00
												Statewide Crash Rate:	0.73	
60469	0001A - 10.04	Int of CASSIDY POINT DR W COMMERCIAL ST	9	5	0	0	0	1	4	20.0	7.894	0.21	1.16	0.00
												Statewide Crash Rate:	0.73	
60470	0001A - 9.95	Int of CASSIDY POINT DR W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.976	0.00	0.40	0.00
												Statewide Crash Rate:	0.15	
73433	0001A - 10.12	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.818	0.00	0.40	0.00
												Statewide Crash Rate:	0.15	
66548	001AS - 2.59	Int of FORE RIVER PKY RD INV 3209586	2	0	0	0	0	0	0	0.0	5.487	0.00	0.37	0.00
												Statewide Crash Rate:	0.15	
Study Years: 3.00		NODE TOTALS:		73	1	1	4	15	52	28.8	64.022	0.38	0.59	0.64

Crash Summary I

Sec																	
Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	K	Injury Crashes				Percent Injury	Annual HMVM	Crash Rate	Critica. Rate	CRF
66542	16747	3140171	0 - 0.16	0001A - 9.70	0.16	2	3	0	0	0	1	2	33.3	0.00788	126.95	441.67	0.00
Int of FORE RIVER PKY VETERANS BRIDGE															Statewide Crash Rate: 216.35		
16747	66547	3117392	0 - 0.05	0001A - 9.86	0.05	2	1	0	0	0	0	1	0.0	0.00201	165.82	621.35	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST															Statewide Crash Rate: 216.35		
66547	60470	3510989	0 - 0.04	0001A - 9.91	0.04	2	0	0	0	0	0	0	0.0	0.00158	0.00	660.91	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST															Statewide Crash Rate: 216.35		
60470	60469	3510990	0 - 0.09	0001A - 9.95	0.09	2	1	0	0	0	0	1	0.0	0.00363	91.93	533.67	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST															Statewide Crash Rate: 216.35		
60469	16779	3121916	0 - 0.06	0001A - 10.04	0.06	2	1	0	0	0	0	1	0.0	0.00231	144.01	599.04	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST															Statewide Crash Rate: 216.35		
16779	73433	4628058	0 - 0.02	0001A - 10.10	0.02	2	2	0	0	0	0	2	0.0	0.00153	436.48	666.98	0.00
Non Int W COMMERCIAL ST															Statewide Crash Rate: 216.35		
73433	73122	4628059	0 - 0.28	0001A - 10.12	0.28	2	2	0	0	1	0	1	50.0	0.02138	31.18	358.15	0.00
Non Int W COMMERCIAL ST															Statewide Crash Rate: 216.35		
73122	16780	4364862	0 - 0.29	0001A - 10.40	0.29	2	12	0	0	1	1	10	16.7	0.02215	180.61	355.82	0.00
Non Int W COMMERCIAL ST															Statewide Crash Rate: 216.35		
16779	60469	3121919	0 - 0.06	001AS - 2.22	0.06	2	0	0	0	0	0	0	0.0	0.00227	0.00	602.24	0.00
Non Int W COMMERCIAL ST															Statewide Crash Rate: 216.35		
60469	16747	4628063	0 - 0.18	001AS - 2.28	0.18	2	0	0	0	0	0	0	0.0	0.00739	0.00	448.24	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST															Statewide Crash Rate: 216.35		
16747	66548	3117394	0 - 0.13	001AS - 2.46	0.13	2	3	0	0	0	1	2	33.3	0.00713	140.18	451.99	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST															Statewide Crash Rate: 216.35		
66548	66542	3121654	0 - 0.04	001AS - 2.59	0.04	2	0	0	0	0	0	0	0.0	0.00188	0.00	631.93	0.00
Int of FORE RIVER PKY RD INV 3209586															Statewide Crash Rate: 216.35		
Study Years:		3.00	Section Totals:		1.40		25	0	0	2	3	20	20.0	0.08114	102.70	291.09	0.35
			Grand Totals:		1.40		98	1	1	6	18	72	26.5	0.08114	402.57	415.60	0.97

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/Yacht Club

RTE # / RD #: 0001A

DATE DRAWN: 8/22/2019 DRAWN BY: Michelle

STUDY FROM: 1/1/2016

STUDY TO: 12/31/2018

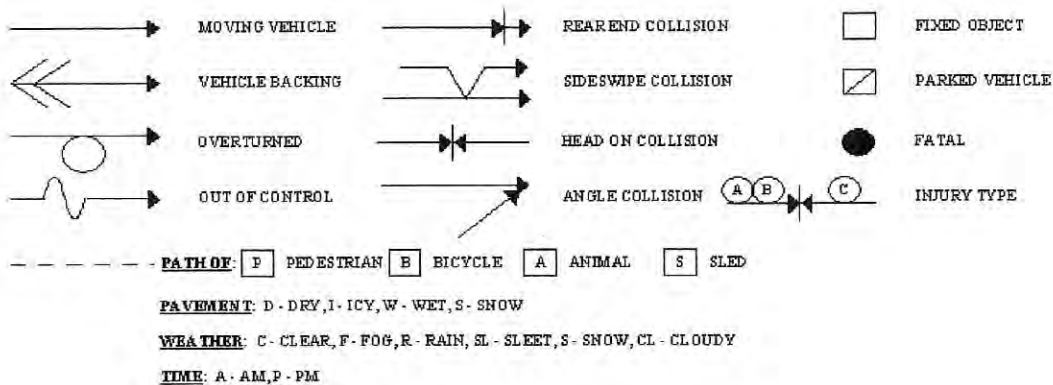
CRASH RATE: 1.37

CRF: 1.17

% INJURY: 40

TOTAL CRASHES: 30

LEGEND



Portland

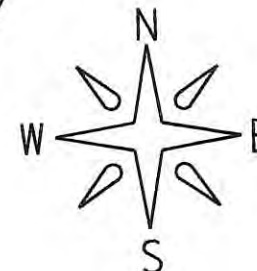
Node: 16780

Study Period: 2016-2018

of Crashes: 30 / CRF: 1.17

Prepared by Office of Safety (MP 8/22/19)

Beach St



West Commercial St
Rt 1A

Pole

Stop
4005 11-16-16 6:00A D/C Unknown
20364 6-20-18 1:01P D/C Unknown

7372 3-6-16 7:10A
D/C Asleep

12257 4-24-18 5:59P
D/C Fail To Yield

23985 8-11-17 11:20A
OII/C Inattention

MC

(C) 17921 6-29-16 4:07P W/R Follow Too Close
(C) 29695 10-19-16 4:14P D/C Follow Too Close
(C) 32685 11-14-16 4:21P D/C Follow Too Close
28223 9-21-17 2:14P D/C Follow Too Close
25199 8-31-16 9:55A D/CL Follow Too Close
20686 7-21-16 3:11P D/C Follow Too Close
24253 8-23-16 5:30P D/C Follow Too Close
(B) 11377 4-6-17 1:45A D/C Inattention
(C) 25652 9-6-18 7:42A D/C Follow Too Close
(C) 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

12363 5-2-16 9:01A W/R Follow Too Close

27334 9-11-17 4:46P D/C Follow Too Close (C)
21053 7-14-17 3:27P D/C Mechanical Failure
3227 1-29-16 5:39P D/C Follow Too Close
29319 10-16-16 12:29P D/C Follow Too Close
36659 12-14-16 4:42P D/C Follow Too Close (C)
9049 3-16-17 5:47P D/CL Follow Too Close (C)
13864 5-14-18 2:45P D/C Follow Too Close

6817 2-29-16 8:00A D/C Destruction External (C)

11220 4-16-16 2:18P
D/C Unknown

FATAL

(K) 34376 10-12-16 1:44P
D/C Operated Recklessly

Pole

Cement Barrier



= Traffic Signal

Portland Yacht Services Inc

SECTION 3

A. ENTRANCE/EXIT LOCATION

There will be three primary driveways into the site from West Commercial Street. All three driveways are proposed to be unsignalized. The westerly driveway will provide the primary access for staff/employees to the 150-space surface parking lot. Staff parking is located on the westside of the building to provide convenient access to the proposed building, as staff entry is differentiated from patient/visitor access into the building. The central driveway is the primary patient/visitor access route and it is located between the clinic building and the proposed site garage to allow for ease of patient access to the clinic building, as well as, vehicular movements in/out of the garage. The most easterly driveway is located east of the parking structure and will provide access for entering and exiting movements out of the garage. The driveway also provides for emergency and heavy vehicle movements around the garage and to the rear of the parking structure avoiding conflicts with other site uses through the westerly and central access driveways.

It is expected that each of the three driveways will require dedicated left-turn lanes for entry movements to the site from West Commercial Street. These lanes and the projected volumes of traffic through them are not expected to significantly overlap with left-turn movements into the Canal Landing Boat facility. The Canal Landing site design also provides three points of access onto West Commercial Street with the central and far westerly driveways infrequently used and carrying limited traffic volumes. The most easterly driveway into the boat yard is located approximately 250-feet east of the proposed parking garage. The Canal Landing traffic volumes are very low and are not expected to conflict with traffic generated by the proposed Clinic site. The existing West Commercial Street road section consists of basically two 15' wide travel lanes and approximately 6" paved shoulders on each side for a total of 42', although, in some areas it is wider at 46'. The right of way width is about 70' on the westerly end and up to 80' on the easterly end of the site frontage.

The Applicant seeks the City's direction on design considerations for providing left-turn treatments to each of the three proposed driveway entrances.

SECTION 3

B. ENTRANCE AND EXIT PLAN VIEW

The City of Portland's Technical Standards require the following sight distance standards for a non-mobility roadway:

Sight Distance Standards

Speed Limit	Sight Distance
25 mph	200 feet
30	250
35	305
40	360
45	425
50	495
55	570

West Commercial Street is currently posted at 40mph in the vicinity of the proposed Community Based Outpatient Clinic site, which requires an unobstructed sightline of 360-feet. A clear line-of-sight in excess of 500-feet was measured "*looking*" in both directions from each of the three proposed driveway entrances to the site.

SECTION 3

C. ENTRANCE/EXIT DESIGN

The proposed project, including all required off-site improvements (if applicable), will be designed and constructed as directed by the City of Portland.

SECTION 4

TITLE, RIGHT OR INTEREST

Attached is a WARRANTY DEED, signed on November 21, 2011 that grants to J.B. Brown & Sons, the described land for the proposed site. The attached Ground lease agreement between J.B. Brown & Sons and FDS JBB Portland, LLC serves as evidence of the RTI for the applicant to the property.

RELEASE DEED

MAINE CENTRAL RAILROAD COMPANY, a corporation duly organized and existing under the laws of the State of Maine, with offices at 1700 Iron Horse Park, North Billerica, Middlesex County, Massachusetts (the "Grantor") in consideration of Seven Hundred Ninety Three Thousand and 00/100 (\$793,000.00) Dollars paid to it by **J.B. BROWN & SONS**, with a mailing address of 36 Danforth Street, Portland, ME 04101 (the "Grantee") hereby grants to the Grantee all the Grantor's right, title and interest, without any warranties or covenants of title whatsoever, in a certain parcel of land, and the buildings, bridges, structures, crossings, fixtures and improvements thereon, if any, situated in Portland, County of Cumberland, State of Maine (the "Premises") described as follows:

SEE EXHIBIT "A" ATTACHED HERETO AND
MADE A PART HEREOF BY THIS REFERENCE.

This conveyance is subject to the following reservations, conditions, covenants and agreements:

1. This conveyance is made without granting any right of way, either by necessity or otherwise, over any remaining land or location of the Grantor.
2. ~~The Grantor hereby reserves an exclusive, permanent right of way and easement in, on, over, under, across and through the Premises for the purpose of accessing, constructing, installing, operating, maintaining, modifying, repairing, replacing, relocating and removing a telecommunications system or other system for transmission of intelligence or information by any means, whether now existing or hereafter devised, including such poles, pipes, wires, fibers, fiberoptic cables, repeater stations, attachments, appurtenances, structures or other equipment and property of any description necessary or useful for the same (the "Telecommunications Easement"). The Grantor further reserves the right to freely lease, license, mortgage, assign, pledge and otherwise alienate the Telecommunications Easement. The Grantee hereby covenants with the Grantor to recognize the Telecommunications Easement and, without the payment of any further consideration, to execute, acknowledge and deliver such instruments suitable for recording with the registry of deeds as the Grantor may reasonably~~

MAINE REAL ESTATE TAX PAID

~~require to acknowledge title to the Telecommunications Easement in the Grantor. The Grantor covenants to reasonably repair and restore the surface of the easement area after any work.~~

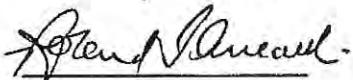
3. ~~The Grantor excepts from this conveyance any and all railroad tracks, railroad track materials (including, but not limited to, ties, connections, switches and ballast) and/or related equipment of any description located in whole or in part within the Premises (the "Trackage") and this conveyance is subject to the right of the Grantor to enter the Premises from time to time and at any and all times within the ninety (90) day period commencing with and subsequent to the date of delivery of this deed, with such men, equipment and materials as, in the reasonable opinion of the Principal Engineering Officer of the Grantor, are necessary for the removal of the Trackage. Days during the months of December, January, February and March shall not be included in the aforesaid ninety (90) day period. If the Trackage is not removed from the Premises by the expiration of said ninety (90) day period, the Trackage shall be deemed abandoned by the Grantor and shall then become the property of the Grantee.~~
4. ~~The Grantor excepts from this conveyance any and all advertising signs and/or billboards located upon the Premises which are not owned by the Grantor. Furthermore, this conveyance is subject to the right of the owners of said signs and/or billboards to go upon the Premises and remove them within ninety (90) days from the date of delivery of this deed.~~
5. By the acceptance of this deed and as part consideration therefor, the Grantee hereby assumes any and all agreements, covenants, obligations and liabilities of the Grantor in respect to any underground facilities, drainage culverts, walls, crossings and/or other structures of any nature and description located in whole or in part within the Premises.
6. By the acceptance of this deed and as part consideration therefor, the Grantee agrees to irrevocably waive, give up and renounce any and all claims or causes of action against the Grantor in respect of claims, suits and/or enforcement actions (including any administrative or judicial proceedings and any remedial, removal or response actions) ever asserted, threatened, instituted or requested by any person and/or governmental agency on account of: (a) any release of oil or hazardous materials or substances of any description on, upon or into the Premises in contravention of any ordinance, law or statute (including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Section 9601, et seq., as amended); and (b) any and all damage to real or personal property, natural resources and/or harm or injury to persons alleged to have resulted from such release of oil or hazardous materials or substances.

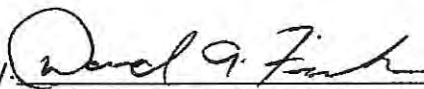
7. ~~By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to build and forever maintain fences (together with any necessary gates), suitable to the Principal Engineering Officer of the Grantor, along the boundaries of the Premises which are common to remaining land or location of the Grantor (the "Fences"), if Fences are ever required in the sole and reasonable opinion of said Principal Engineering Officer.~~
8. ~~This conveyance is subject to the following restriction for the benefit of other land or location of the Grantor, to wit: that from the date of delivery of this deed, the Grantor shall not be liable to the Grantee or any lessee or user of the Premises (or any part thereof) for any damage to any buildings or property upon them caused by fire, whether communicated directly or indirectly by or from locomotive engines of any description upon the railroad operated by the Grantor, or otherwise.~~
9. ~~By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to make no use of the Premises which, in the sole and reasonable opinion of the Principal Engineering Officer of the Grantor, adversely affects, increases or decreases drainage to, from, upon or in any remaining land or location of the Grantor. The Grantee agrees to indemnify and save the Grantor harmless from and against any and all loss, cost, damage or expense including, but not limited to, the cost of defending all claims and/or suits for property damage, personal injury or death arising out of or in any way attributable to any breach of the foregoing covenant.~~
10. ~~The Grantor excepts from this conveyance any and all overhead, surface or underground signal and communication line facilities of the Grantor located within the limits of the Premises and this conveyance is subject to the Grantor's use of any such facilities in their present locations and entry upon the Premises from time to time to maintain, repair, replace, renew, relay or remove such facilities.~~
11. The strikeout sections in this Deed are intentionally deleted.
12. Whenever used in this deed, the term "Grantor" shall not only refer to the **MAINE CENTRAL RAILROAD COMPANY**, but also its successors, assigns and affiliates and the term "Grantee" shall not only refer to the above-named Grantee, but also the Grantee's successors, assigns and grantees, as the case may be.

13. The several exceptions, reservations, conditions, covenants and agreements contained in this deed shall be deemed to run with the land and be binding upon the Grantee forever. In addition to the acceptance and recording of this deed, the Grantee hereby signifies assent to the said several exceptions, reservations, conditions, covenants and agreements, by joining in its execution.

IN WITNESS WHEREOF, the said **MAINE CENTRAL RAILROAD COMPANY** has caused this release deed to be executed in its name and its corporate seal to be hereto affixed by David A. Fink, its President, thereunto duly authorized this 21st day of November, 2011.

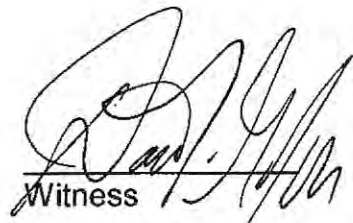
GRANTOR:
MAINE CENTRAL RAILROAD COMPANY

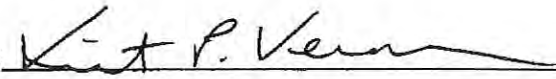

Witness

By: 
David A. Fink, President

SEAL

GRANTEE:
J.B. BROWN & SONS


Witness

By: 
Print Name: Vincent P. Veroneau

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

11/21, 2011

On this 21st day of November, 2011, before me, the undersigned notary public, personally appeared the above-named David A. Fink, the President of the **MAINE CENTRAL RAILROAD COMPANY** as aforesaid, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Notary Public: Roland L. Theriault
My Commission Expires: August 5, 2016
 **ROLAND L. THERIAULT**
Notary Public
Commonwealth of Massachusetts
My Commission Expires
August 5, 2016

STATE OF MAINE

Cumberland, ss.

11/23, 2011

On this 23rd day of November, 2011, before me, the undersigned notary public, personally appeared the above-named Vincent P. Veroneau, of **J.B. Brown & Sons**, as aforesaid, proved to me through satisfactory evidence of identification, which was personally known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Notary Public: David L. Galgay Jr.
My Commission Expires:
Attorney at Law -
David L. Galgay Jr.
BAR # 003643

Exhibit A

A certain lot or parcel of land, with the buildings thereon, situated on the northerly side of West Commercial Street, in the City of Portland, County of Cumberland, and State of Maine, bounded and described as follows:

Beginning at a point on the northerly sideline of West Commercial Street, on the westerly sideline of the former Emery Street now land of J. B. Brown and Sons;

Thence, S 66°06'27" W along the northerly sideline of said West Commercial Street 784.47 feet;

Thence, S 71°39'57" W along the northerly sideline of said West Commercial Street 731.36 feet;

Thence, S 80°52'21" W along the northerly sideline of said West Commercial street 437.92 feet to the West Commercial Street off-ramp;

Thence, along said off-ramp, the following courses and distances:

Northwesterly, along a curve to the right having a radius of 1023.32 feet, a delta of 7°02'02", and whose chord bears N 88°49'29" W, a distance of 125.55 feet, an arc length of 125.63 feet;

N 66°06'38" W a distance of 93.96 feet;

Northwesterly, along a curve to the left, having a radius of 194.00 feet, a delta of 38°27'00", and whose chord bears N 85°20'08" W, a distance of 127.76 feet, an arc length of 130.19 feet;

S 75°26'22" W a distance of 33.57 feet;

Thence; N 81°44'16" W along land now or formerly of the State of Maine 171.41 feet;

Thence, N 08°15'44" E along land of said State of Maine 22.46 feet to the southerly sideline of Danforth Street;

Thence along said Danforth Street the following courses and distances:

N 83°43'02" E a distance of 96.39 feet;

Northeasterly, along a curve to the left, having a radius of 1042.16 feet, a delta of 12°51'52", and whose chord bears N 77°17'06" E, a distance of 233.50 feet, an arc length of 233.99 feet;

N 70°51'10" E a distance of 187.93 feet;

Northeasterly, along a curve to the right, having a radius of 800.00 feet, a delta of 2°21'41", and whose chord bears N 72°02'04" E, a distance of 32.97 feet, an arc length of 32.97 feet to land now or formerly of South Rise Condominiums;

Thence along said South Rise Condominium land the following courses and distances:

S 11°41'22" E a distance of 168.00 feet;

N 81°56'51" E a distance of 271.00 feet;

N 77°01'13" E a distance of 96.62 feet;

N 75°17'24" E a distance of 51.37 feet to land now or formerly of Shaw;

Thence, N 72°46'26" E along land of said Shaw 94.47 feet;

Thence, N 35°07'51" W along land of said Shaw 69.73 feet to the southerly terminus of "K" Street;

Thence, along said "K" Street, along the southerly side of a 40 foot passageway and the terminus of "E" Street the following courses and distances:

N 55°46'28" E a distance of 17.74 feet;

N 55°46'28" E a distance of 58.47 feet;

N 54°19'46" E a distance of 397.81 feet to land now or formerly of the City of Portland;

Thence, S 35°05'23" E along land of said City of Portland 56.55 feet;

Thence, N 69°03'30" E along land of said City of Portland and land now or formerly of Noonan 85.21 feet;

Thence, N 34°36'51" W along land of said Noonan 92.60 feet to land now or formerly of McFarland;

Thence, N 54°37'05" E along land now or formerly of McFarland, Curtis, Dilworth, Moberg, McDonough and Robertson 367.27 feet to land now or formerly of Pollard & Lantos;

Thence, S 35°47'03" E along land of said Pollard & Lantos 119.22 feet;

Thence, N 54°52'09" E along land of said Pollard & Lantos, and land now or formerly of Bessire and Dyro 441.22 feet to the centerline of Emery Street;

Thence, S 35°05'32" E along the centerline of Emery Street, 153.86 feet;

Thence, N 55°14'50" E a distance of 30.00 feet to the easterly sideline of Emery Street;

Thence, S 35°05'32" E along said easterly sideline, 24.61 feet to the intersection of the easterly side of Emery Street at its intersection with the southerly sideline of Salem Street;

Thence, S 55°14'50" W along land now or formerly of J. B. Brown 60.00 feet;

Thence, S 35°05'22" E along land now or formerly of J. B. Brown 172.39 feet to West Commercial Street and the point of beginning, containing 10.65 acres, more or less. Also

conveying all right, title and interest of Maine Central Railroad Company in and to Emery Street lying within and adjacent to the land herein conveyed.

Reference, is made to a survey by Owen Haskell, Inc. dated October 13, 2011 Job # 2010-095P for a further description of the above described premises.

Reference is also made to the premises conveyed in that certain deed from the Portland Terminal Company to the Maine Central Railroad Company dated December 30, 1985 and recorded in the Cumberland County Registry of Deeds in Book 7026, Page 192.

3607968_1

Received
Recorded Register of Deeds
Nov 23, 2011 12:54:33P
Cumberland County
Pamela E. Lovley

GROUND LEASE AGREEMENT

THIS GROUND LEASE AGREEMENT ("Lease") is made this 27th day of November, 2018, by and between J.B. BROWN & SONS, a Maine corporation of Portland, Cumberland County, Maine (hereinafter referred to as "Landlord"), and FDS JBB PORTLAND, LLC, a Delaware limited liability company having its principal place of business in Arlington, Virginia (hereinafter referred to as "Tenant").

WITNESSETH:

In consideration of the mutual covenants and agreements contained herein and intending to be legally bound hereby, Landlord and Tenant hereby agree with each other as follows:

SECTION 1. Premises: Landlord hereby ground leases, demises and lets to Tenant, and Tenant hereby takes and hires from Landlord, for the term and upon and subject to the terms, conditions, covenants and provisions set forth in this Lease, the following described premises (sometimes hereinafter referred to as the "Premises"):

All of that certain tract, piece or parcel of land on the westerly side of Commercial Street in the City of Portland, County of Cumberland and State of Maine, being more particularly described in Exhibit A attached hereto,

together with any and all improvements, appurtenances, rights, privileges and easements benefiting, belonging or pertaining to the parcel described in Exhibit A. Landlord is the sole owner of fee simple title to the Premises. Tenant has entered into or intends to enter into a lease ("GSA Lease") with the United States General Services Administration ("GSA") pursuant to which the GSA intends to occupy the building to be constructed by Tenant in accordance with the requirements set forth in the Lease.

SECTION 2. Term: The initial term of this Lease shall commence on the date hereof (hereinafter referred to as the "Effective Date") and shall continue for a period ending at 11:59 p.m. on twentieth (20th) anniversary of the "Rent Commencement Date" (as herein defined), subject to extension pursuant to Section 3 below. The "Rent Commencement Date" shall be the first day of the month after the date on which Tenant's construction of its proposed building to be situated on the Premises is substantially complete and the GSA accepts the space pursuant to the GSA Lease, unless sooner terminated as herein provided.

SECTION 3. Extension Terms: At the expiration of the initial term of this Lease, the initial term shall be automatically extended for three (3) additional successive periods of ten (10) years each, each upon all of the same other terms, covenants and conditions contained in this Lease, but subject to increases in rent as set forth in Section 4 hereof; provided, however, that Tenant may cancel this Lease, effective as of the date of expiration of the initial term or as of the date of expiration of any of the ten (10) year extension periods, by giving written notice in accordance with Section 26 hereof of such cancellation to Landlord at least twelve (12) months prior to the expiration of the initial term, or the expiration of any of the said ten (10) year extension periods,

as the case shall be. The expression "term of this Lease" and expressions of similar tenor shall mean and refer to the initial term as the same shall have been extended in accordance herewith. The expression "lease year" shall mean each successive twelve-month period during the term of this Lease, with the first such "lease year" to begin with the Rent Commencement Date.

SECTION 4. Rent: During the initial term of this Lease, Tenant covenants and agrees to pay to Landlord, at the address set forth in Section 26 with regard to notices or at such other place as Landlord shall by notice to Tenant from time to time direct, without offset or deduction and without previous demand therefor, base rent in the amount of

payable in equal quarterly installments, each of which shall be one-quarter (1/4th) of said annual rent, in advance on each January 1st, April 1st, July 1st and October 1st.

The base rent amount for each option period shall be mutually agreed to between Landlord and Tenant no later than twelve (12) months prior to the expiration of the initial term, or the expiration of the then option period, but in no event shall the annual base rent be less than the base rent paid in the final year of the immediately preceding year.

SECTION 5. Rent to be Net to Landlord: It is the intention of the parties that the base rent paid to Landlord shall be net to Landlord so that this Lease yields to Landlord the base rent specified herein, and that all costs, expenses and obligations of every kind and nature whatsoever relating to the Premises during the term of this Lease shall be paid by Tenant.

SECTION 6. Use and Restrictions: The Premises may be used for any lawful purpose, including without limitation, leasing of the Premises or a portion thereof to the GSA pursuant to the GSA Lease.

SECTION 7. Taxes and Utility Expenses: (a)(1) Tenant shall, during the term of this Lease, as additional rent, pay and discharge punctually, as and when the same shall become due and payable, all taxes, special and general assessments, water rents, rates and charges, sewer rents and other governmental impositions and charges of every kind and nature whatsoever, extraordinary as well as ordinary (hereinafter referred to as "Taxes"), and each and every installment thereof which shall or may during the term of this Lease be charged, levied, laid, assessed, imposed, become due and payable, or a lien upon, or for, or with respect to, the Premises or any part thereof, or any buildings, appurtenances or equipment owned by Tenant thereon or therein or any part thereof, together with all interest and penalties thereon, under or by virtue of all present or future laws, ordinances, requirements, orders, directives, rules or regulations of the federal, state, county and municipal governments and of all other governmental authorities whatsoever (all of which shall also be included in the term "Taxes" as heretofore defined); and all sewer rents and charges for water, steam, gas, heat, hot water, electricity, light and power, and other service or services furnished to the Premises or the occupants thereof during the term of this Lease.

(2) To the extent that the same may be permitted by law, Tenant or its designees shall have the right to apply for the conversion of any assessment for local improvements assessed during the term of this Lease in order to cause the same to be payable in annual installments, and upon such conversion, Tenant shall pay and discharge punctually said

installments as they shall become due and payable during the term of this Lease. Landlord agrees to permit the application for the foregoing conversion to be filed in Landlord's name, if necessary, and shall execute any and all documents requested by Tenant to accomplish the foregoing result.

(3) Tenant shall be deemed to have complied with the covenants of this paragraph (a) if payment of such Taxes shall have been made either within any period allowed by law or by the governmental authority imposing the same during which payment is permitted without penalty or interest or before the same shall become a lien upon the Premises, and Tenant shall produce and exhibit to Landlord evidence of such payment, if Landlord shall demand the same in writing.

(b) All such Taxes, including assessments which have been converted into installments as set forth in the preceding paragraph (a), which shall become payable during each of the calendar or fiscal tax years, as the case may be, in which the term of this Lease commences or terminates, shall be apportioned pro rata between Landlord and Tenant in accordance with the respective portions of such year during which such term shall be in effect.

(c) (1) Tenant or its designee shall have the right to contest or review all such Taxes by legal proceedings, or in such other manner as it may deem suitable (which, if instituted, Tenant or its designees shall conduct promptly at its own cost and expense, and, if necessary, in the name of and with the cooperation of Landlord, and Landlord shall execute all documents reasonably necessary to accomplish the foregoing). Notwithstanding the foregoing, Tenant shall promptly pay all such Taxes if at any time the Premises or any part thereof shall then be immediately subject to forfeiture, or if Landlord shall be subject to any liability arising out of the nonpayment thereof.

(2) The legal proceedings referred to in the preceding subparagraph (1) shall include appropriate certiorari proceedings and appeals from orders therein and appeals from any judgments, decrees, or orders. In the event of any reduction, cancellation or discharge, Tenant shall pay the amount finally levied or assessed against the Premises or adjudicated to be due and payable on any such contested Taxes.

SECTION 8. Improvements. Repairs. Additions and Replacements: (a)(1) Tenant shall have the right to construct upon the Premises such buildings, appurtenant structures, roadways, walkways, parking areas, service areas and other similar and dissimilar improvements as Tenant shall desire, provided, however, that all such buildings, structures and other improvements shall be constructed in a good and workmanlike manner, in compliance with all applicable building and zoning codes and ordinances.

(2) After the Effective Date, Tenant shall submit to the City of Portland, Maine a completed application for site plan review. Thereafter, Tenant shall diligently and in good faith seek to obtain all zoning changes and variances, environmental and land use permits, and all other governmental licenses, permits and approvals that shall be necessary or convenient for the use and operation of the Premises in accordance with the terms of the GSA Lease. All the said zoning variances, environmental and land use permits, and other governmental licenses,

permits (including building permits) and approvals required to be obtained by Tenant for the use and operation of the Premises in accordance with the terms of the GSA Lease are hereinafter referred to as the "Permits."

(3) Landlord shall cooperate with Tenant, at no material out-of-pocket cost to Landlord, in any and all applications, proceedings and appeals relating to the Permits, and shall, at the request of Tenant, execute and deliver any application, instrument, consent, approval or other document as may be reasonably required for purposes of obtaining any of the Permits, provided that no such application, instrument, consent, approval or other document shall operate to require Landlord to incur any costs or expenses or shall operate to impose any restrictions on Landlord that are inconsistent with the rights and obligations of the parties set forth in this Lease. Tenant may prosecute such applications, proceedings and appeals in its own or in Landlord's name and through counsel of its choice, provided that if prosecuted in Landlord's name, Tenant shall use counsel reasonably acceptable to Landlord and shall indemnify, defend and hold harmless Landlord against any claims arising from Tenant's wrongful acts or the negligent or wrongful acts of Tenant's agents, principals, employees or contractors in prosecuting such applications, proceedings or appeals in Landlord's name.

(4) Notwithstanding anything to the contrary herein, if Tenant shall fail to obtain the Permits within thirty six (36) months after the Effective Date, Tenant may cancel and terminate this Lease by giving Landlord notice of such cancellation and termination within thirty six (36) months after the Effective Date, and upon the giving of such notice, this Lease shall thereby be cancelled and terminated and the parties hereto shall have no further rights or obligations hereunder except for those rights and obligations which by the express terms of this Lease survive such termination. For the purposes hereof, Tenant shall be deemed to have "obtained" the Permits only if (i) all necessary Permits have been issued, the Permits contain no conditions or requirements that in the reasonable opinion of Tenant will materially and adversely affect its proposed use of the Premises, the Permits are not subject to any legal challenge or appeal, and all periods within which any such challenge or appeal may be brought shall have expired, or (ii) Tenant shall notify Landlord that it has obtained all necessary Permits.

(5) Tenant shall perform its construction activities in a manner so as to avoid unreasonable interference with any operations of the Landlord within its adjacent or nearby real property and will cause its construction vehicles, equipment and materials to be stored within the area designated on the site plan or, if not so designated, within a staging area mutually acceptable to Landlord and Tenant, and will, upon request by Landlord, erect temporary construction fences or barricades around Tenant's construction area and will keep the remainder of the Landlord's adjacent or nearby real property free of Tenant's construction debris and equipment.

(b) During construction of the improvements on the Premises, Tenant shall maintain in force and effect, at its cost and expense, reasonable amounts of builder's risk insurance covering the improvements, and such other insurance as will protect Landlord, Tenant and their respective designees from claims for damages because of bodily injury, including death, and from claims for damages to property, which may arise out of or in connection with the construction activities at or near the Premises, whether performed by Tenant or by Tenant's contractors or subcontractors or anyone employed by any of them. Tenant shall deposit with

Landlord, prior to commencement of the construction and thereafter within ten (10) days prior to the expiration of the applicable policies, certificates evidencing such insurance coverage.

(c) Tenant alone shall be responsible for maintaining the buildings and improvements at any time erected on the Premises, and Landlord shall not be required to furnish any services or facilities or to make any improvements, repairs or alterations in or to the Premises during the term of this Lease.

(d) Until the expiration or sooner termination of this Lease, title to any building or buildings or improvements situate or erected on the Premises and the building equipment and other items installed thereon and any alteration, change or addition thereto shall remain solely in Tenant, and Tenant alone shall be entitled to deduct all depreciation on Tenant's income tax returns for any such building or buildings, building equipment and/or other items, improvements, additions, changes or alterations.

(e) On the last day or sooner termination of the term of this Lease, Tenant shall quit and surrender to Landlord the Premises, and any buildings and permanent improvements then thereon.

(f) During the term of this Lease, Landlord shall have the right, but not the obligation, to construct such access roadways and walkways between roadways and walkways of the Premises and Landlord's adjacent property as Landlord shall determine in its reasonable discretion.

SECTION 9. Requirements of Public Authority: (a) During the term of this Lease, Tenant shall, at its own cost and expense, promptly observe and comply with all present and future laws, ordinances, requirements, orders, directives, rules and regulations of the federal, state, county, town and city governments and of all other governmental authorities affecting the Premises or appurtenances thereto or any part thereof whether the same are in force at the commencement of the term of this Lease or may in the future be passed, enacted or directed.

(b) Tenant shall have the right to contest, by appropriate legal proceedings diligently conducted in good faith, in the name of Tenant, or Landlord (if legally required), or both (if legally required), without cost or expense to Landlord, the validity or application of any law, ordinance, rule, regulation or requirement of the nature referred to in paragraph (a) of this section and, if by the terms of any such law, ordinance, order, rule, regulation or requirement, compliance therewith may legally be delayed pending the prosecution of any such proceeding, Tenant may delay such compliance therewith until the final determination of such proceeding.

(c) Landlord agrees to execute and deliver any appropriate papers or other instruments which may be necessary or proper to permit Tenant so to contest the validity or application of any such law, ordinance, order, rule, regulation or requirement and to fully cooperate with Tenant in such contest.

SECTION 10. Covenant Against Liens: If, because of any act or omission of Tenant, any mechanic's lien or other lien, charge or order for the payment of money shall be filed against

Landlord or any portion of the Premises, Tenant shall, at its own cost and expense, cause the same to be discharged of record or bonded within thirty (30) days after written notice from Landlord to Tenant of the filing thereof; and Tenant shall indemnify and save harmless Landlord against and from all costs (including reasonable attorneys' fees), liabilities, suits, penalties, claims and demands resulting therefrom.

SECTION 11. Access to Premises: Subject to the terms of the GSA Lease, Landlord shall have the right to enter upon the Premises at all reasonable times upon reasonable prior notice to Tenant to examine the same provided such entry shall not unreasonably interfere with the businesses then being conducted on the Premises.

SECTION 12. Assignment and Subletting: Tenant shall have the right to enter into the GSA Lease and to assign this Lease and/or to sublet all or any part of the Premises at any time, and from time to time, during the term of this Lease, provided that, notwithstanding any such assignment or subletting, Tenant shall remain directly and primarily liable for the performance of its obligations under this Lease, unless the assignee or sublessee expressly agrees in writing with Landlord to assume all such obligations and has a financial creditworthiness that is reasonably acceptable to Landlord. As to any subletting or assignment of this Lease, within thirty (30) days after the execution of any such assignment, Tenant shall deliver to Landlord a copy of the instrument of assignment together with an agreement (which may be a part of the instrument of assignment) whereby the assignee shall assume, as a direct obligation to Landlord, all of the obligations of Tenant under this Lease.

SECTION 13. Signs: Tenant shall obtain the prior written approval of Landlord to install, maintain and replace upon the Premises or any part thereof any signs, which approval shall not be unreasonably withheld, conditioned or delayed. Any such signs shall comply with any applicable requirements of governmental authorities having jurisdiction and Tenant shall obtain any necessary permits for such purposes. As used in this Section 13, the word "sign" shall be construed to include any placard, light or other advertising symbol or object, irrespective of whether the same be temporary or permanent.

SECTION 14. Indemnity: (a) Tenant shall defend, save harmless, protect and indemnify Landlord from and against any and all losses, liabilities, damages, claims, suits, demands, actions, judgments, costs and expenses which shall arise from, grow out of, or be attributable to (i) Tenant's possession, use, occupation or control of the Premises during the term of the Lease, (ii) any injury to, or death of, any person or persons, or damage to any property while on or about the Premises during the term of the Lease, or (iii) any negligence, act or default of Tenant or its agents, servants, employees, guests or contractors. Tenant shall, at its own cost and expense, defend any and all suits or actions (just or unjust) which may be brought against Landlord or in which Landlord may be impleaded with others upon any such above-mentioned matter, except as may result from the acts set forth in paragraph (b) of this Section 14.

(b) Except for its gross negligence or willful misconduct or the gross negligence or willful misconduct of its officers, agents, servants, employees or contractors, Landlord shall not be responsible or liable for any damage or injury to any property, fixtures, buildings or other improvements, or to any person or persons, at any time on the Premises, including any damage

or injury to Tenant or to any of Tenant's officers, agents, servants, employees, contractors, customers or sublessees.

SECTION 15. Insurance: (a) Tenant shall provide at its expense, and keep in force during the term of this Lease, commercial general public liability insurance in a good and solvent insurance company or companies licensed to do business in the State of Maine, selected by Tenant, and reasonably satisfactory to Landlord, in the amount of at least One Million Dollars (\$1,000,000.00) per occurrence and Two Million Dollars (\$2,000,000.00) general aggregate. Such policy or policies shall include Landlord as an additional assured. Tenant agrees to deliver certificates of such insurance to Landlord at the beginning of the term of this Lease and thereafter not less than ten (10) days prior to the expiration of any such policy. Such insurance shall be noncancellable without ten (10) days' written notice to Landlord.

(b) During the term of this Lease, Tenant shall keep all buildings and improvements erected by Tenant on the Premises at any time insured for the benefit of Landlord and Tenant, as their respective interests may appear, against loss or damage by fire, and those casualties covered by the customary extended coverage endorsements, in a minimum amount necessary to avoid the effect of coinsurance provisions of the applicable policies. All proceeds payable at any time and from time to time by any insurance company under such policies shall be payable to Tenant. Any proceeds paid to Tenant shall be retained by Tenant, and Landlord shall not be entitled to, and shall have no interest in, such proceeds or any part thereof. Landlord shall, at Tenant's cost and expense, cooperate fully with Tenant in order to obtain the largest possible recovery and shall execute any and all consents and other instruments and take all other actions necessary or desirable in order to effectuate the same and to cause such proceeds to be paid as hereinbefore provided and Landlord shall not carry any insurance concurrent in coverage and contributing in the event of loss with any insurance required to be furnished by Tenant hereunder if the effect of such separate insurance would be to reduce the protection or the payment to be made under Tenant's insurance.

(c) Any insurance required to be provided by Tenant pursuant to this Lease may be provided by blanket insurance covering the Premises and other locations of Tenant provided such blanket insurance complies with all of the other requirements of this Lease with respect to the insurance involved.

(d) Each of Landlord and Tenant hereby releases the other and its officers, directors, shareholders, agents and employees, to the extent of any net insurance proceeds received by the releasor, from any and all liability or responsibility (to the other or anyone claiming through or under them by way of subrogation or otherwise) for any loss or damage to property caused by fire or other catastrophe, even if such fire or other catastrophe shall have been caused by the fault or negligence of the other party, or anyone for whom such party may be responsible.

SECTION 16. Destruction: In the event that, at any time during the term of this Lease, any one or more of the buildings on the Premises shall be destroyed or damaged in whole or in part by fire or other cause within the extended coverage of the fire insurance policies carried by Tenant in accordance with this Lease, then, Tenant, at its own cost and expense, shall cause the same to

be repaired, replaced or rebuilt within a period of time which, under all prevailing circumstances, shall be reasonable.

SECTION 17. Eminent Domain: (a) If the whole of the Premises shall be taken for any public or quasi-public use under any statute or by right of eminent domain or by private purchase in lieu thereof, then this Lease shall automatically terminate as of the date that possession has been taken. In the event of a partial taking (or purchase) of the Premises pursuant to which more than fifty percent (50%) of the land area of the Premises is so taken (or so purchased) or if as a result of a taking (or purchase) the Premises is deprived of direct access to the public streets and highways, or are not reasonably usable for Tenant's purposes, then Tenant shall have the right, but not the obligation, to terminate this Lease by giving written notice of such termination to Landlord on or prior to the date which is sixty (60) days after the date of such taking (or purchase), and upon the giving of such notice of termination the term of this Lease shall expire and come to an end on the last day of the calendar month in which such notice shall be given with the same force and effect as if said day had been originally fixed herein as the expiration date of the term of this Lease. In the event the Lease shall terminate or be terminated, the rental shall, if and when necessary, be adjusted to the day of the taking (or purchase) and neither party shall have any further rights or liabilities hereunder.

(b) In the event of a taking (or purchase) resulting in the termination of this Lease pursuant to the provisions of paragraph (a) of this Section 17 the parties hereto agree to cooperate in applying for and in prosecuting any claim for such taking and further agree that the aggregate net award pertaining to the Premises, after deducting all expenses and costs, including reasonable attorneys' fees, incurred in connection therewith, payable to both Landlord and Tenant shall be divided between Landlord and Tenant as follows:

(i) Landlord shall first be paid an amount equal to the fair market value of the land taken from Landlord, considered as a vacant, unencumbered and unrestricted land with available utilities, as of the date of taking (or purchase), together with interest thereon from the date of taking (or purchase) to the date of payment at the rate paid on said award, and if such value shall be officially determined and stated in the condemnation proceedings, then the amount thereof shall control for the purposes hereof; otherwise, the same, unless agreed upon by the parties to this Lease, shall be determined by arbitration;

(ii) Tenant shall then be paid an amount equal to the depreciated value of any leasehold improvements made upon the Premises by Tenant as carried on Tenant's books for financial reporting purposes; and

(iii) any amount then remaining, after the payments to Landlord and Tenant specified in subparts (i) and (ii) hereinabove, shall be paid to Landlord.

(c) (1) In the event of a partial taking (or purchase) not resulting in the termination of this Lease, pursuant to the provisions of paragraph (a) of this Section 17, Tenant shall, at its own cost and expense, make all repairs to the buildings and improvements on the Premises affected by such taking (or purchase) to the extent necessary to restore the same to a

complete architectural unit (to the extent permitted, however, taking into consideration the amount of land remaining after any such taking or purchase); provided, however, that Tenant shall not be obligated to expend an amount in excess of the proceeds of the net award available to Tenant for such purposes, as hereinafter provided.

(2) All compensation available or paid to Landlord and Tenant upon such a partial taking (or purchase) shall be paid to Tenant for the purpose of paying towards the cost of such restoration, or, in the event that the parties hereto agree that only a portion of the aggregate award is sufficient to so restore, then only such portion as agreed upon shall be paid to Tenant for such purpose and the balance shall be distributed pursuant to subparagraph (3) of this paragraph (c) of this Section 17.

(3) All compensation available or paid to Landlord and Tenant upon such a partial taking (or purchase) in excess of the amount thereof needed by Tenant to repair and restore the buildings and improvements shall be distributed in the same manner as is provided in subparts (i) and (ii) of paragraph (b) of this Section 17, except that all compensation for any temporary taking shall be distributed to Tenant without participation by Landlord.

SECTION 18. Utility Easements: Tenant shall have the right to enter into reasonable agreements with utility companies and/or public authorities which provide necessary utilities, creating easements in favor of such companies and/or authorities as are required in order to service the occupants of the buildings on the Premises, and Landlord covenants and agrees to consent thereto and to execute any and all documents, agreements and instruments, and to take all other actions, in order to effectuate the same, all at Tenant's cost and expense.

SECTION 19. Quiet Enjoyment: Tenant, upon paying the rent and additional rent and all other sums and charges to be paid by it as herein provided, and observing and keeping all covenants, warranties, agreements and conditions of this Lease on its part to be kept, shall quietly have and enjoy the Premises and appurtenant rights during the term of this Lease, without hindrance or molestation by any party claiming by, through or under Landlord.

SECTION 20. Tenant's Covenants; Environmental Compliance: (a) In addition and supplementary to any other provisions of this Lease and not in limitation thereof, Tenant covenants and agrees as follows:

(i) to pay when due all rent, additional rent and other charges hereunder, and to observe and perform all other agreements and obligations of Tenant under this Lease at the times and in the manner provided herein;

(ii) to procure any licenses and permits required for any use made of the Premises; and upon the expiration or termination of this Lease, to remove from the Premises all personal property, equipment, goods and effects of Tenant and those of all parties holding under Tenant and to yield up peaceably to Landlord the Premises in working order, repair and condition in all respects, damage by fire or other casualty or by condemnation or taking (provision for all

of which is made elsewhere in this Lease) and reasonable wear and tear only excepted;

(iii) not to make any use of the Premises which is improper, offensive or illegal or which is prohibited by the provisions of this Lease; nor to permit any act or thing to be done on the Premises which shall constitute waste or a nuisance; and

(iv) to furnish Landlord with the name, address and telephone number of Tenant's property manager of the Premises so that Landlord will at all times be able to contact the property manager of the Premises.

(b) Tenant shall not cause or permit the release, discharge, placement or deposit upon the Premises of any Hazardous Materials (as hereinafter defined). In the event any Hazardous Materials shall be released, discharged, placed or deposited upon the Premises during the term of this Lease, Tenant shall (1) conduct and complete all investigations, studies, sampling, and testing and all remedial, removal, reporting and other actions necessary to clean up and remove, or to identify and handle, all Hazardous Materials on, from or affecting the Premises in accordance with all applicable federal, state and local laws, regulations, rules, ordinances and policies, in accordance with the orders and directives of all federal, state and local governmental authorities, and (2) defend, indemnify and hold harmless Landlord, and its employees, agents, officers and directors, from and against any and all claims, demands, penalties, fines, liabilities, settlements, damages, costs or expenses (including, without limitation, reasonable attorney and consultant fees, investigation and laboratory fees, court costs and litigation expenses) of whatever kind or nature, known or unknown, contingent or otherwise, arising out of or in any way related to (i) the presence, disposal, release, or threatened release of any Hazardous Materials which are on, from or affecting the Premises caused by Tenant, its employees, agents, officers or directors; (ii) any personal injury (including wrongful death) or property damage (real or personal) arising out of or related to Hazardous Materials on, from or affecting the Premises caused by Tenant, its employees, agents, officers or directors; (iii) any lawsuit brought or threatened, settlement reached or government order relating to Hazardous Materials on, from or affecting the Premises and caused by Tenant, its employees, agents, officers or directors; and/or (iv) any violation of laws, orders, regulations, requirements, or demands of government authorities, or any policies or requirements of Landlord which are based upon or in any way related to Hazardous Materials on, from or affecting the Premises caused by Tenant, its employees, agents, officers or directors. For purposes of this provision, the term "Hazardous Materials" includes, without limitation, any flammable explosives, radioactive materials, hazardous materials, hazardous waste, hazardous or toxic substances, oil or petroleum products, asbestos or related materials; including as the same are defined in the Comprehensive Environmental Response Compensation and Liability Act of 1980, as amended (42 U.S.C. §§ 9601, et seq.), the Hazardous Materials Transportation Act, as amended (49 U.S.C. §§ 1801, et seq.), the Resource Conservation and Recovery Act, as amended (42 U.S.C. §§ 6901, et seq.), applicable Maine Statutes (including 38 M.R.S.A. §§ 561, et seq., 38 M.R.S.A. §§ 1361 et seq., 38 M.R.S.A. §§ 1301 et seq., and 38 M.R.S.A. §§ 1317, et seq.), and in the regulations adopted and publications promulgated pursuant thereto. Notwithstanding the foregoing, Tenant shall not be responsible or liable to Landlord for any Hazardous Materials to the extent that such

Hazardous Materials were on, from or affecting the Premises prior to the Rent Commencement Date or were generated, stored, handled, transported, disposed of, discharged or released by Landlord or its agents, employees, licensees or contractors, except to the extent exacerbated by any negligence or willful misconduct with respect to the foregoing by Tenant, its agents, employees, licensees or contractors. In addition to the foregoing, Tenant shall provide Landlord with copies of any notices, correspondence, warnings, guidance or other written materials received from any governmental authority or other person or entity in connection with Hazardous Materials on, upon, under, from or into the Premises and shall give Landlord written notice of its discovery or release of any Hazardous Materials on, upon, under, from or into the Premises. The foregoing provisions shall be in addition to any other obligations and liabilities Tenant may have under this Lease, at common law or otherwise, and shall survive the termination of this Lease.

(c) Tenant acknowledges Landlord's concern that the Premises be and remain in compliance with applicable environmental laws, regulations, rules, ordinances and policies and that Landlord has a direct interest in such matters and, therefore, without limiting Tenant's obligations under this Section 20, or otherwise, Tenant agrees that Landlord may, but shall be under no obligation to, undertake some or all of the matters referred to in the foregoing part (b) on behalf of Tenant, upon giving Tenant at least thirty (30) days prior written notice and failure by Tenant to undertake same, and thereupon Tenant shall have no further right to undertake such matters itself, but shall continue to be liable to Landlord pursuant to Tenant's indemnity.

SECTION 21. Defaults; Remedies: (a) In the event Tenant shall fail to pay any installment of rent or additional rent within ten (10) days after receipt of written notice from Landlord to Tenant, or if Tenant shall neglect or fail to perform or observe any of the terms, provisions, conditions and covenants herein contained, and on Tenant's part to be performed, or observed for a period of thirty (30) days after the Landlord shall have given Tenant notice of such neglect or failure, or if a receiver, guardian, conservator, trustee in bankruptcy or similar officer shall be appointed by a court of competent jurisdiction to take charge of all or any part of Tenant's property, which appointment is not stayed or terminated within ninety (90) days, or if Tenant commits any act of bankruptcy, or if a petition is filed by Tenant under any bankruptcy or insolvency law, and the same shall not be dismissed within ninety (90) days from the date upon which it is filed, and provided Tenant shall not cure said failure as provided in paragraph (b) of this Section 21; then, Landlord may, at its option, give to Tenant a notice of election to end the term of this Lease upon a date specified in such notice, which date shall be not less than sixty (60) days after the date of receipt by Tenant of such notice from Landlord, and upon the date specified in said notice, the term and estate hereby vested in Tenant shall cease and any and all other right, title and interest of Tenant hereunder shall likewise cease without further notice or lapse of time, as fully and with like effect as if the entire term of this Lease had elapsed.

(b) In the event that Landlord gives notice of a default of such a nature that it cannot be cured within such thirty (30) day period, then such default shall not be deemed to continue so long as Tenant, after receiving such notice, proceeds to cure the default as soon as reasonably possible and continues to take all steps necessary to complete the same within a period of time which, under all prevailing circumstances, shall be reasonable. No default shall be deemed to

continue if and so long as Tenant shall be so proceeding to cure the same in good faith or be delayed in or prevented from curing the same by any of the causes specified in Section 25 hereof.

(c) Upon any termination of the term of this Lease pursuant to paragraph (a) of this Section 21, or at any time thereafter, Landlord may, in addition to and without prejudice to any other rights and remedies Landlord shall have at law or in equity, reenter the Premises, and recover possession thereof and dispossess any or all occupants of the Premises in the manner prescribed by the statute relating to summary proceedings, or similar statutes.

(d) No such expiration or termination of this Lease, or summary proceedings, reentry or dispossess, shall relieve Tenant of its liability and obligation under this Lease, whether or not the Premises shall be relet, and Tenant covenants and agrees, in the event of any such expiration or termination of this Lease, or summary proceedings, reentry or dispossess, to pay to Landlord, upon demand, in a single lump sum, the total of (1) all minimum rent, additional rent and other charges due and unpaid as of the date of such expiration or termination, (2) all reasonable costs and expenses incurred by Landlord in connection with its termination of this Lease and/or recovery of possession of the Premises, and (3) either (x) as liquidated damages a sum equal to the discounted value (using as a discount rate the Prime Rate as quoted by The Wall Street Journal or its successor on the date of such payment) of the amount, if any, by which the rent reserved hereunder for the remainder of the term of this Lease shall exceed the fair rental value of the Premises for the remainder of the term of this Lease, discounted to the date of payment, or (y) amounts equal to the several installments of rent and other charges reserved as would, under the terms of this Lease, on the days originally fixed herein for the payment thereof, become due and payable if this Lease had not so expired or been terminated, or if Landlord had not entered or reentered as aforesaid, and whether the Premises be relet or remain vacant in whole or in part or for a period less than the remainder of the term, and for the whole thereof, up to but not exceeding the amount of any deficiency then existing after giving due credit for any net proceeds of any reletting after deducting all of Landlord's reasonable expenses in connection with such reletting, including reasonable brokers' and attorneys' fees and the reasonable costs of recovering possession of and refitting the Premises; and any suit brought to collect the amount of the deficiency for any month or other period shall not prejudice in any way the rights of Landlord to collect the amount of the deficiency for any subsequent month or other period by similar proceeding. Landlord shall use reasonable efforts to relet the Premises after any such expiration or termination of this Lease.

(e) If Tenant shall become a debtor under the United States Bankruptcy Code, 11 U.S.C. §§ 101 et seq. (the "Bankruptcy Code") then, to the extent that the Bankruptcy Code may be applicable or affect the provisions of this Lease, the following provisions shall also be applicable. If the trustee or debtor-in-possession shall fail to elect to assume this Lease within sixty (60) days after the commencement of a case under the Bankruptcy Code, this Lease shall be deemed to have been rejected; and the Landlord shall be thereafter immediately entitled to possession of the Premises and this Lease shall be terminated subject to and in accordance with the provisions of this Lease and of law (including such provisions for damages). No election to assume (and, if applicable to assign) this Lease by the trustee or debtor-in-possession shall be permitted or effective unless (i) all defaults shall have been cured and Landlord shall have been provided with adequate assurances reasonably satisfactory to Landlord, including (1) any

reasonably required guaranties and/or security deposits, and (2) any other reasonably required assurances that there will continue to be sufficient funds to professionally operate the Premises in strict compliance with all provisions of this Lease; and (ii) neither such assumption nor the operation of the Premises subsequent thereto shall, in Landlord's reasonable judgment, cause or result in any breach or other violation of any provision of this or any applicable lease, mortgage or other contract; and (iii) the assumption and, if applicable, the assignment of this Lease satisfies in full the provisions of the Bankruptcy Code, including, without limitation, Sections 365(b)(1) and (3) and (f)(2); and (iv) the assumption has been ratified and approved by order of such court or courts as have final jurisdiction over the Bankruptcy Code and the case. No assignment of this Lease by the trustee or debtor-in-possession shall be permitted or effective unless the proposed assignee likewise shall have satisfied (i), (ii), (iii) and (iv) of the preceding sentence regarding such assignment. When pursuant to the Bankruptcy Code the trustee or debtor-in-possession is obligated to pay reasonable use and occupancy charges, such charges shall not be less than the rent and other charges specified herein to be payable by Tenant. Neither Tenant's interest or estate in the Premises herein or created hereby nor any lesser interest or estate of Tenant shall pass to anyone under any law of any state or jurisdiction without the prior written consent of Landlord. In no event shall this Lease, if the term hereof has expired or has been terminated in accordance with the provisions of this Lease, be revived, and no stay or other proceedings shall nullify, postpone or otherwise affect the expiration or earlier termination of the term of this Lease pursuant to the provisions of this Section 21, or prevent Landlord from regaining possession of the Premises thereupon.

SECTION 22. Arbitration: (a) In any case in which this Lease provides that a dispute shall be determined by arbitration, the arbitration shall be facilitated through the services of JAMS and conducted in accordance with the following paragraphs.

(b) A party initiating arbitration proceedings may do so by giving notice to that effect to the other party. The notice shall designate a disinterested person as one of the arbitrators. The body which initiates arbitration is hereinafter referred to as the "first party". The other party is hereinafter referred to as the "second party". Within fifteen (15) days after the initiation of the arbitration proceedings, the second party shall give notice to the first party designating another disinterested person as an arbitrator. Within the next twenty (20) days, the two arbitrators shall select a third disinterested person as a third arbitrator. The three arbitrators shall judge the dispute. If the second party shall fail to appoint a second arbitrator within the fifteen (15) day period next following the notice initiating the arbitration, the arbitrator designated by the first party shall judge the dispute and the judgment of the first arbitrator shall be binding upon the parties.

(c) If the two arbitrators appointed by the parties shall be unable to agree upon the appointment of a third arbitrator within the twenty (20) day period after the second arbitrator is designated, the two arbitrators shall give written notice of the failure to agree to each of the parties. If the parties shall fail to agree upon the selection of a third arbitrator within fifteen (15) days after that notice has been received, then within thirty (30) days thereafter either party may apply for the appointment of a third arbitrator to the presiding justice of the existing session of the Cumberland County Superior Court.

(d) The determination of the majority of the arbitrators shall be conclusive upon the parties. The arbitrators shall be directed to interpret and apply the terms of this Lease. Judgment may be entered upon the award of the arbitrators by either party in the Cumberland County Superior Court.

(e) The obligation of Landlord and Tenant to submit a dispute to arbitration is limited to disputes arising under those Sections of this Lease which specifically provide for arbitration. Each party to the arbitration shall pay one-half (1/2) of the cost thereof.

SECTION 23. Waivers: The failure of Landlord or Tenant to complain of any act or omission on the part of the other party no matter how long the same may continue, shall not be deemed to be a waiver by said party of any of its rights hereunder. No waiver by Landlord or Tenant at any time, express or implied, of any breach of any provision of this Lease shall be deemed a waiver of a breach of any other provision of this Lease or a consent to any subsequent breach of the same or any other provision. No acceptance by Landlord of any partial payment shall constitute an accord or satisfaction but shall only be deemed a part payment on account.

SECTION 24. Zoning and Building Codes: Landlord covenants and agrees to cooperate fully with Tenant in any and all applications and proceedings and appeals made or prosecuted by Tenant in connection with obtaining any necessary approvals or consents under the zoning, land use and/or building regulations, ordinances, codes, laws and directives of all of the federal, state, town and other authorities having jurisdiction over the development and use of the Premises, including, without limitation, the Portland Planning Board and the State Board of Environmental Protection. Landlord shall execute any and all documents, instruments, consents and authorizations requested by Tenant which shall be necessary or desirable with respect thereto. Tenant may prosecute such applications, proceedings and appeals in its own name or in Landlord's name and through counsel of its choice, but shall do so at its own cost and expense.

SECTION 25. Force Majeure: In the event that Landlord or Tenant shall be delayed, hindered in or prevented from the performance of any act (except for the payment of rent) required hereunder by reason of strikes, lock-outs, labor troubles, inability to procure materials, failure of power, restrictive governmental laws or regulations, riots, insurrection, the act, failure to act or default of the other party, war or other reason beyond their control, then performance of such act shall be excused for the period of the delay, and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay.

SECTION 26. Notices: Every notice, approval, consent or other communication authorized or required by this Lease shall not be effective unless the same shall be in writing and sent postage prepaid by United States registered or certified mail, return receipt requested, directed to the other party at its address set forth hereinbelow, or such other address as either party may designate by notice given from time to time in accordance with this Section 26. The rent payable by Tenant hereunder shall be paid to Landlord at the same place where a notice to Landlord is herein required to be directed. All such notices and other communications initially shall be addressed to Landlord at 10 Free Street, Suite 100, Portland, Maine 04101; and to the Tenant at 1001 N. 19th Street, Suite 1401, Arlington, Virginia 22209.

SECTION 27. Certificates: Either party shall, without charge, at any time and from time to time hereafter, within fifteen (15) days after written request of the other, certify by written instrument duly executed and acknowledged to any mortgagee or purchaser, or proposed mortgagee or proposed purchaser, or any other person, firm or corporation specified in such request: (a) as to whether this Lease has been supplemented or amended, and if so, the substance and manner of such supplement or amendment; (b) as to the validity and force and effect of this Lease, in accordance with its tenor as then constituted; (c) as to the existence of any default thereunder; (d) as to the existence of any offsets, counterclaims or defenses thereto on the part of such other party; (e) as to the commencement and expiration dates of the term of this Lease; and (f) as to any other matters as may reasonably be so requested. Any such certificate may be relied upon by the party requesting it and any other person, firm or corporation to whom the same may be exhibited or delivered, and the contents of such certificate shall be binding on the party executing same.

SECTION 28. Leasehold Mortgages: Tenant and every successor and assign of Tenant is hereby given the right by Landlord in addition to any other rights herein granted, without Landlord's prior written consent, to mortgage its leasehold interest in this Lease, or any part or parts thereof, under one or more leasehold mortgages, and to assign this Lease, or any part or parts thereof, and any subleases as collateral security for such leasehold mortgage(s), upon the condition that all rights acquired under such leasehold mortgage(s) shall be subject to each and all of the covenants, conditions and restrictions set forth in this Lease, and to all rights and interests of Landlord herein, none of which covenants, conditions or restrictions is or shall be waived by Landlord by reason of the right given so to grant leasehold mortgages with respect to such interest in this Lease, except as expressly provided herein. The term "leasehold mortgage(s)" as used in this Section 28 and other provisions of this Lease shall include leasehold mortgages, leasehold deeds of trust, collateral or conditional assignments of Tenant's interest in this Lease and like instruments and all modifications, extensions, renewals and replacements thereto. No leasehold mortgage given by Tenant under the provisions of this Section shall be deemed to be an assignment of this Lease so as to require the assumption of said obligations and liabilities by the holder(s) of such mortgage. If Tenant and/or Tenant's successors and assigns shall grant a leasehold mortgage with respect to this leasehold or any part or parts thereof, and if the holder(s) of such leasehold mortgage(s) shall send to Landlord written notice of such leasehold mortgage(s) specifying the name and address of the leasehold mortgagee(s), Landlord agrees that so long as any such leasehold mortgage(s) shall remain unsatisfied of record or until written notice of satisfaction is given by the holder(s) to Landlord, the following provisions shall apply:

(a) There shall be no cancellation, surrender or modification of this Lease by joint action of Landlord and Tenant without the prior consent in writing of the leasehold mortgagee(s).

(b) Landlord shall, upon serving Tenant with any notice of default, also serve a copy of such notice upon the holder(s) of such leasehold mortgage(s), and no such notice of default to Tenant shall be effective unless and until a copy of such notice is served upon each such holder. The leasehold mortgagee(s) shall thereupon have the same period, after service of such notice upon it, to remedy or cause to be remedied the defaults complained of, and Landlord shall accept

such performance by or at the instigation of such leasehold mortgagee(s) as if the same had been done by Tenant.

(c) Anything herein contained notwithstanding, while such leasehold mortgage(s) remains unsatisfied of record, or until written notice of satisfaction is given by the holder(s) to Landlord, if any default shall occur which, pursuant to any provision of this Lease, entitles Landlord to terminate this Lease, and if before the expiration of thirty (30) days from the date of service of notice of termination upon such leasehold mortgagee(s) such leasehold mortgagee(s) shall have notified Landlord of its desire to nullify such notice and shall have paid to Landlord all rent and additional rent and other payments herein provided for, and then in default, and shall have complied or shall commence the work of complying with all of the other requirements of this Lease, if any are then in default, and shall prosecute the same to completion with reasonable diligence, then in such event Landlord shall not be entitled to terminate this Lease and any notice of termination theretofore given shall be void and of no effect.

(d) If Landlord shall elect to terminate this Lease by reason of any default of Tenant, the leasehold mortgagee(s) shall not only have the right to nullify any notice of termination by curing such default, as aforesaid, but shall also have the right to postpone and extend the specified date for the termination of this Lease as fixed by Landlord in its notice of termination, for a period of not more than six (6) months, provided that such leasehold mortgagee(s) shall cure or cause to be cured any then existing money defaults and meanwhile pay the rent, additional rent and comply with and perform all of the other terms, conditions and provisions of this Lease on Tenant's part to be complied with and performed, other than past non-monetary defaults, and provided further, that the leasehold mortgagee(s) shall forthwith take steps to acquire or sell Tenant's interest in this Lease by foreclosure of the mortgage(s) or otherwise and shall prosecute the same to completion with all due diligence. If at the end of said six (6) month period the leasehold mortgagee(s) shall be actively engaged in steps to acquire or sell Tenant's interest herein, the time of said leasehold mortgagee to comply with the provisions of this Section shall be extended for such period as shall be reasonably necessary to complete such steps with reasonable diligence and continuity.

(e) Landlord agrees that in the event of termination of this Lease for any reason, Landlord will at the election of the leasehold mortgagee enter into a new lease of the Premises with the leasehold mortgagee(s) or its nominee(s), for the remainder of the term, effective as of the date of such termination, at the rent and additional rent and upon the terms, provisions, covenants and agreements as herein contained and subject only to the same conditions of title as this Lease is subject to on the date of the execution hereof, and to the rights, if any, of the parties then in possession of any part of the Premises, provided:

(i) Said leasehold mortgagee(s) or its nominee(s) shall make written request upon Landlord for such new lease within thirty (30) days after the date of such termination and such written request is accompanied by payment to Landlord of sums then due to Landlord under this Lease.

(ii) Said leasehold mortgagee(s) or its nominee(s) shall pay to Landlord at the time of the execution and delivery of said new lease, any and all

sums which would at the time of the execution and delivery thereof be due pursuant to this Lease but for such termination, and in addition thereto, any expenses, including reasonable attorneys' fees, to which Landlord shall have been subjected by reason of such default.

(iii) Said leasehold mortgagee(s) or its nominee(s) shall perform and observe all covenants herein contained on Tenant's part to be performed and shall further remedy any other conditions which Tenant under this Lease was obligated to perform under the terms of this Lease.

(iv) Landlord shall not warrant possession of the Premises to Tenant under the new lease.

(v) Such new lease shall be expressly made subject to the rights, if any, of Tenant under this Lease.

(vi) Tenant under such new lease shall have the same right, title and interest in and to the buildings and improvements on the Premises as Tenant had under this Lease.

(f) Any leasehold mortgage holder or any person acquiring the leasehold estate pursuant to a foreclosure of the leasehold mortgage or a deed or assignment in lieu of such foreclosure may, upon such acquisition, without further consent of the Landlord, sell and assign the leasehold estate on such terms and conditions as it may determine and thereafter be relieved of all obligations under this Lease accruing from and after the date of such sale and assignment.

(g) Landlord agrees promptly after submission to execute, acknowledge and deliver any agreements modifying this Lease reasonably requested by any leasehold mortgagee(s), provided that such modification does not decrease Tenant's obligations or decrease Landlord's rights pursuant to this Lease.

(h) The leasehold mortgagee(s) shall be given notice of any arbitration proceedings by the parties hereto and shall have the right to intervene therein and be made a party to such proceedings, and the parties hereto do hereby consent to such intervention. In the event that the leasehold mortgagee(s) shall not elect to intervene or become a party to such proceedings, the leasehold mortgagee(s) shall receive notice of and a copy of any award or decision made in said arbitration proceedings.

(i) The proceeds from any insurance policies or arising from a condemnation are to be held by any leasehold mortgagee(s) and used pursuant to the provisions of this Lease, but the leasehold mortgagee(s) may reserve its rights to apply to the mortgage debt all, or any part, of Tenant's share of such proceeds pursuant to such leasehold mortgage(s).

(j) There shall be no merger of this Lease, nor of the leasehold estate created hereby, with the fee estate in the Premises, by reason of the fact that this Lease, or the leasehold estate created hereby, or any interest in either thereof, may be held directly or indirectly by or for the

account of any person who shall own the fee estate in the Premises or any portion therein, and no such merger shall occur unless and until all persons at the time having any interest in the fee estate and all persons having any interest in this Lease or the leasehold estate, including the leasehold mortgagee(s), shall join in a written instrument effecting such merger.

(k) Landlord shall upon request execute, acknowledge and deliver to each leasehold mortgagee(s) an agreement prepared at the sole cost and expense of Tenant in form satisfactory to such leasehold mortgagee(s) between Landlord, Tenant and the leasehold mortgagee(s), agreeing to all of the provisions of this Section 28.

SECTION 29.: Omitted.

SECTION 30. Acceptance of Premises: Tenant agrees to accept the Premises "as is", without any representation or warranty by Landlord as to the use or condition thereof.

SECTION 31. Attorneys' Fees: Landlord shall be entitled to recover from Tenant all costs and expenses (including reasonable attorneys' fees) reasonably incurred by Landlord in enforcing the provisions of this Lease and/or in repossessing the Premises upon termination of this Lease in accordance with Section 21 hereof. The provisions of this Section 31 shall survive the termination of this Lease.

SECTION 32. Governing Law: This Lease and the performance thereof shall be governed, interpreted, construed and regulated by the laws of the State of Maine.

SECTION 33. Partial Invalidity: If any term, covenant, condition or provision of this Lease or the application thereof to any person or circumstance shall, at any time or to any extent, be invalid or unenforceable, the remainder of this Lease, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term, covenant, condition and provision of this Lease shall be valid and enforceable to the fullest extent permitted by law.

SECTION 34. Short Form Lease: The parties will, at any time, at the request of either one, promptly execute duplicate originals of an instrument, in recordable form, which will constitute a short form of lease, setting forth a description of the Premises, the term of this Lease and any other portions thereof, excepting the rental provisions, as either party may request.

SECTION 35. Interpretation: Wherever herein the singular number is used, the same shall include the plural, and the masculine gender shall include the feminine and neuter genders, and vice versa, as the context shall require. The section headings used herein are for reference and convenience only, and shall not enter into the interpretation hereof. This Lease may be executed in several counterparts, each of which shall be an original, but all of which shall constitute one and the same instrument.

SECTION 36. Entire Agreement: No oral statements or prior written matter shall have any force or effect. Tenant agrees that it is not relying on any representations or agreements other

than those contained in this Lease. This Lease shall not be modified or cancelled except by writing subscribed by both parties.

SECTION 37. Parties: Except as herein otherwise expressly provided, the covenants, conditions and agreements contained in this Lease shall bind and inure to the benefit of Landlord and Tenant and their respective successors, personal representatives, administrators and assigns.

SECTION 38. Limitation of Landlord's Liability: It is understood and agreed that, except for matters resulting from the intentional misrepresentations, willful acts, or gross negligence of Landlord, Tenant shall look solely to the estate and property of Landlord subject to this Lease for the satisfaction of Tenant's remedies for the collection of a judgment (or other judicial process) requiring the payment of money by Landlord in the event of any default or breach by Landlord with respect to any of the terms, covenants and conditions of this Lease to be observed or performed by Landlord, and any other obligations of Landlord created by or under this Lease, and no other property or assets of Landlord or of its officers, directors, or members (as the case may be) shall be subject to levy, execution or other enforcement procedures for the satisfaction of Tenant's remedies except as aforesaid.

SECTION 39. Holding Over: In the event that Tenant shall continue in occupancy of the Premises after the expiration of the term hereof, such occupancy shall not be deemed to extend or renew the terms of this Lease, but such occupancy shall continue as a tenancy at will from month to month upon the covenants, provisions and conditions herein contained at a rent equal to 1.25 times the rent in effect during the last lease year of the term, prorated and payable for the period of such occupancy. This Section shall not be construed as giving Tenant any right to hold over after the expiration of the term hereof except as is otherwise expressly provided in this Lease.

SECTION 40. No Broker: Landlord and Tenant agree that no brokers have been involved in this transaction, and each agrees to hold and indemnify the other harmless from and against any losses, damages, costs or expenses (including reasonable attorneys' fee) that either party may suffer as a result of claims made or suits brought by any other broker in connection with this transaction, the obligated party hereunder to be the party whose conduct gives rise to such claim. The provisions of this Section 40 shall survive any termination of this Lease.

[SIGNATURES BEGIN ON NEXT PAGE]

IN WITNESS WHEREOF, the parties hereto have duly executed this Lease as of the day and year first above written.

WITNESS:

Ann L. Stelbello

J.B. BROWN & SONS

By: Vincent P. Veroneau
Its President

"Landlord"

WITNESS:

[Signature]

FDS JBB PORTLAND, LLC

By: FD Stonewater, LLC, its
Managing Member

By: Claiborne Williams
Its
Thereunto duly authorized

"Tenant"

EXHIBIT A

A certain lot or parcel of land situated on the westerly side of Commercial Street in the City of Portland, County of Cumberland and State of Maine, and being more particularly bounded and described as follows:

Attached

Proposed Description
Lot A
113 West Commercial Street
Portland, ME
November 12, 2019

A certain lot or parcel of land located on the northerly side of West Commercial Street in the City of Portland, County of Cumberland, State of Maine, bounded and described as follows:

Beginning at a capped iron rod (PLS 2518) located at the intersection with the southwesterly sideline of Emery Street and the northwesterly sideline of West Commercial Street. Thence:

- 1) S 66°07'19" W by said West Commercial Street a distance of Seven Hundred Eighty-Seven and 39/100 (787.39) feet to a point;
- 2) S 71°41'30" W by said West Commercial Street a distance of Six Hundred Seven and 20/100 (607.20) feet to a capped iron to be set;
- 3) N 18°18'30" W through land of the Grantor a distance of Fifty-Six and 55/100 (56.55) feet to a point at the centerline of a formerly contemplated street known as "K" Street and the southeasterly corner of land now or formerly of Marjorie R. Shaw as described in a deed recorded in the Cumberland County Registry of Deeds in Book 9747, Page 339;
- 4) N 35°07'13" W by said land of Shaw and the said centerline of "K" Street a distance of Sixty-Seven and 16/100 (67.16) feet to a capped iron rod (PLS 2518) located at the southerly sideline of a Forty (40) foot wide passageway;
- 5) N 54°52'47" E by said passageway a distance of Four Hundred Seventy-Nine and 00/100 (479.00) feet to a capped iron rod (PLS 2518) located at the centerline of a formerly contemplated street known as "E" Street;
- 6) S 35°07'13" E by said centerline of "E" Street a distance of One Hundred and 00/100 (100.00) feet to a capped iron rod (PLS 2518);
- 7) N 54°52'47" E by said "E" Street and land now or formerly of Susan Jane Noonan as described in a deed recorded in said Registry in Book 7400, Page 261 a distance of Eighty and 00/100 (80.00) feet to a capped iron rod (PLS 2518);
- 8) N 35°07'13" W by said land of Noonan a distance of One Hundred Seventeen and 61/100 (117.61) feet to a capped iron rod (PLS 2518) located at the southerly corner of land now or formerly of Devens M. Hamlen and Samar Post Jamali as described in a deed recorded in said Registry in Book 32451, Page 99;
- 9) N 54°40'20" E by said land of Hamlen and Jamali, land now or formerly of Michael R. Curtis and Margaret T. Curtis as described in a deed recorded in said Registry in Book 27799, Page 302, land now or formerly of Sarah P. Daignault 2016 Trust as described in a deed recorded in said Registry in Book 34034, Page 150, land now or formerly of George R. Moberg and Elizabeth J. Moberg as described in a deed recorded in said Registry in Book 2928, Page 450, land now or formerly of Michael Bruenjes and Judith

Bruenjes as described in a deed recorded in said Registry in Book 32805, Page 285, and land now or formerly of Sonia B. Robertson as described in a deed recorded in said Registry in Book 22292, Page 241 a distance of Three Hundred Sixty-Five and 73/100 (365.73) feet to a point at land now or formerly of Thomas R. Robinson and Laura C. Robinson as described in a deed recorded in said Registry in Book 31889, Page 194;

- 10) S 34°34'17" E by said land of Robinson a distance of One Hundred Eighteen and 82/100 (118.82) feet to a point;
- 11) N 54°51'25" E by said land of Robinson, land now or formerly of Mark Bessire and Aimee Bessire as described in a deed recorded in said Registry in Book 27820, Page 339, and land now or formerly of Stephen Dyro as described in a deed recorded in said Registry in Book 30108, Page 100 a distance of Four Hundred Thirteen and 77/100 (413.77) feet to a point at the southwesterly sideline of said Emery Street;
- 12) S 35°05'25" E by said Emery Street a distance of Three Hundred Fifty and 71/100 (350.71) feet to the point of beginning.

Bearings are referenced to grid north, Maine State Plane Coordinate System, West Zone, NAD83.

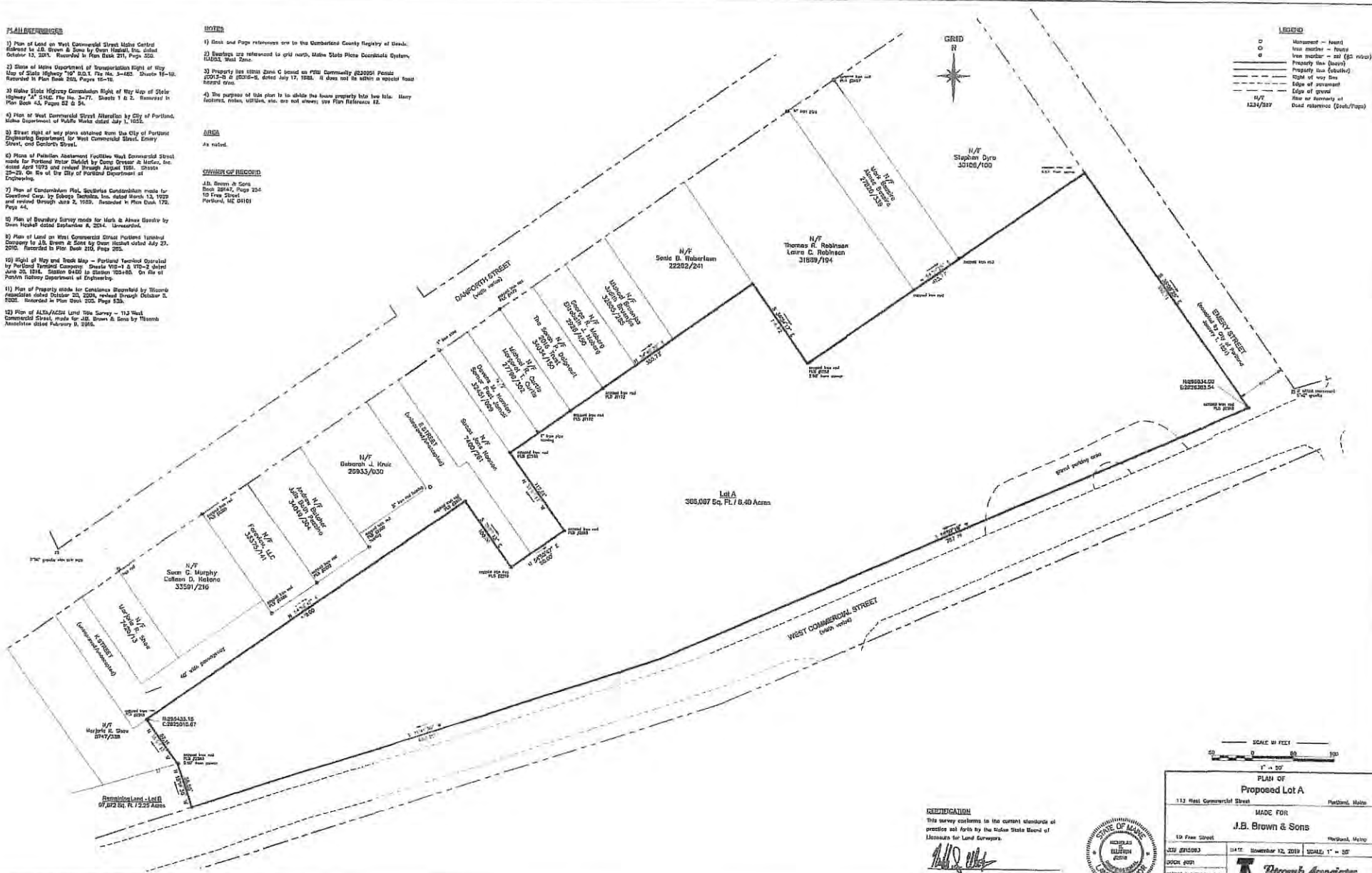
The above described parcel contains 366,067 square feet / 8.40 acres. Meaning and intending to describe a portion of property as described in a deed recorded in the Cumberland County Registry of Deeds in Book 29147, Page 254.

- 1) Plan of Land on West Commercial Street Between Main and Central Streets to J.B. Brown & Sons by John Haggard, Inc. dated 10/25/20, 200 pages through addendum 1, 10/25/20, 10/25/20, 10/25/20
- 2) Status of Maine Department of Transportation Right of Way of State Highway "90" R.O.D. The, No. 5-482, Sheets 10-10, 10/25/20, 10/25/20, 10/25/20, 10/25/20
- 3) Maine State Highway Commission Right of Way of 261 Highway "2" R.O.D. The, No. 5-727, Sheets 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-20, 2-21, 2-22, 2-23, 2-24, 2-25, 2-26, 2-27, 2-28, 2-29, 2-30, 2-31, 2-32, 2-33, 2-34, 2-35, 2-36, 2-37, 2-38, 2-39, 2-40, 2-41, 2-42, 2-43, 2-44, 2-45, 2-46, 2-47, 2-48, 2-49, 2-50, 2-51, 2-52, 2-53, 2-54, 2-55, 2-56, 2-57, 2-58, 2-59, 2-60, 2-61, 2-62, 2-63, 2-64, 2-65, 2-66, 2-67, 2-68, 2-69, 2-70, 2-71, 2-72, 2-73, 2-74, 2-75, 2-76, 2-77, 2-78, 2-79, 2-80, 2-81, 2-82, 2-83, 2-84, 2-85, 2-86, 2-87, 2-88, 2-89, 2-90, 2-91, 2-92, 2-93, 2-94, 2-95, 2-96, 2-97, 2-98, 2-99, 2-100, 2-101, 2-102, 2-103, 2-104, 2-105, 2-106, 2-107, 2-108, 2-109, 2-110, 2-111, 2-112, 2-113, 2-114, 2-115, 2-116, 2-117, 2-118, 2-119, 2-120, 2-121, 2-122, 2-123, 2-124, 2-125, 2-126, 2-127, 2-128, 2-129, 2-130, 2-131, 2-132, 2-133, 2-134, 2-135, 2-136, 2-137, 2-138, 2-139, 2-140, 2-141, 2-142, 2-143, 2-144, 2-145, 2-146, 2-147, 2-148, 2-149, 2-150, 2-151, 2-152, 2-153, 2-154, 2-155, 2-156, 2-157, 2-158, 2-159, 2-160, 2-161, 2-162, 2-163, 2-164, 2-165, 2-166, 2-167, 2-168, 2-169, 2-170, 2-171, 2-172, 2-173, 2-174, 2-175, 2-176, 2-177, 2-178, 2-179, 2-180, 2-181, 2-182, 2-183, 2-184, 2-185, 2-186, 2-187, 2-188, 2-189, 2-190, 2-191, 2-192, 2-193, 2-194, 2-195, 2-196, 2-197, 2-198, 2-199, 2-200, 2-201, 2-202, 2-203, 2-204, 2-205, 2-206, 2-207, 2-208, 2-209, 2-210, 2-211, 2-212, 2-213, 2-214, 2-215, 2-216, 2-217, 2-218, 2-219, 2-220, 2-221, 2-222, 2-223, 2-224, 2-225, 2-226, 2-227, 2-228, 2-229, 2-230, 2-231, 2-232, 2-233, 2-234, 2-235, 2-236, 2-237, 2-238, 2-239, 2-240, 2-241, 2-242, 2-243, 2-244, 2-245, 2-246, 2-247, 2-248, 2-249, 2-250, 2-251, 2-252, 2-253, 2-254, 2-255, 2-256, 2-257, 2-258, 2-259, 2-260, 2-261, 2-262, 2-263, 2-264, 2-265, 2-266, 2-267, 2-268, 2-269, 2-270, 2-271, 2-272, 2-273, 2-274, 2-275, 2-276, 2-277, 2-278, 2-279, 2-280, 2-281, 2-282, 2-283, 2-284, 2-285, 2-286, 2-287, 2-288, 2-289, 2-290, 2-291, 2-292, 2-293, 2-294, 2-295, 2-296, 2-297, 2-298, 2-299, 2-300, 2-301, 2-302, 2-303, 2-304, 2-305, 2-306, 2-307, 2-308, 2-309, 2-310, 2-311, 2-312, 2-313, 2-314, 2-315, 2-316, 2-317, 2-318, 2-319, 2-320, 2-321, 2-322, 2-323, 2-324, 2-325, 2-326, 2-327, 2-328, 2-329, 2-330, 2-331, 2-332, 2-333, 2-334, 2-335, 2-336, 2-337, 2-338, 2-339, 2-340, 2-341, 2-342, 2-343, 2-344, 2-345, 2-346, 2-347, 2-348, 2-349, 2-350, 2-351, 2-352, 2-353, 2-354, 2-355, 2-356, 2-357, 2-358, 2-359, 2-360, 2-361, 2-362, 2-363, 2-364, 2-365, 2-366, 2-367, 2-368, 2-369, 2-370, 2-371, 2-372, 2-373, 2-374, 2-375, 2-376, 2-377, 2-378, 2-379, 2-380, 2-381, 2-382, 2-383, 2-384, 2-385, 2-386, 2-387, 2-388, 2-389, 2-390, 2-391, 2-392, 2-393, 2-394, 2-395, 2-396, 2-397, 2-398, 2-399, 2-400, 2-401, 2-402, 2-403, 2-404, 2-405, 2-406, 2-407, 2-408, 2-409, 2-410, 2-411, 2-412, 2-413, 2-414, 2-415, 2-416, 2-417, 2-418, 2-419, 2-420, 2-421, 2-422, 2-423, 2-424, 2-425, 2-426, 2-427, 2-428, 2-429, 2-430, 2-431, 2-432, 2-433, 2-434, 2-435, 2-436, 2-437, 2-438, 2-439, 2-440, 2-441, 2-442, 2-443, 2-444, 2-445, 2-446, 2-447, 2-448, 2-449, 2-450, 2-451, 2-452, 2-453, 2-454, 2-455, 2-456, 2-457, 2-458, 2-459, 2-460, 2-461, 2-462, 2-463, 2-464, 2-465, 2-466, 2-467, 2-468, 2-469, 2-470, 2-471, 2-472, 2-473, 2-474, 2-475, 2-476, 2-477, 2-478, 2-479, 2-480, 2-481, 2-482, 2-483, 2-484, 2-485, 2-486, 2-487, 2-488, 2-489, 2-490, 2-491, 2-492, 2-493, 2-494, 2-495, 2-496, 2-497, 2-498, 2-499, 2-500, 2-501, 2-502, 2-503, 2-504, 2-505, 2-506, 2-507, 2-508, 2-509, 2-510, 2-511, 2-512, 2-513, 2-514, 2-515, 2-516, 2-517, 2-518, 2-519, 2-520, 2-521, 2-522, 2-523, 2-524, 2-525, 2-526, 2-527, 2-528, 2-529, 2-530, 2-531, 2-532, 2-533, 2-534, 2-535, 2-536, 2-537, 2-538, 2-539, 2-540, 2-541, 2-542, 2-543, 2-544, 2-545, 2-546, 2-547, 2-548, 2-549, 2-550, 2-551, 2-552, 2-553, 2-554, 2-555, 2-556, 2-557, 2-558, 2-559, 2-560, 2-561, 2-562, 2-563, 2-564, 2-565, 2-566, 2-567, 2-568, 2-569, 2-570,

1) Book and Page references are to the Cumberland County Registry of Deeds.
2) Bearings are referenced to grid north, Maine State Plane Coordinate System, NAD83, West Zone.
3) Property lies within Zone C based on FVM Community #230051 Points 2002-5 and 20216-9, dated July 17, 1981. It does not lie within a special town forest area.
4) The purpose of this plot is to divide the above property into two lots. Many features, poles, utilities, etc. are not shown; see Plan Reference #2.

As noted

J.H. Brown & Sons
Box 28147, Page 234
10 Free Steel
Portland, ME 04101



REMITIGATION
This survey conforms to the current standards of practice set forth by the Alaska State Board of Measures for Land Surveyors.

Michael S. Dittler, P.L.C. 7/25/11



PLAN OF
Proposed Lot A

113 Main Commercial Street
Portland, Maine

MADE FOR
J.B. Brown & Sons

10 Free Street
Portland, Maine

JEP #21025
BOOK 2021
RECORDING CHARGE: 0.00
FILE #2003

DATE: November 12, 2019
SCALE: 1" = 50'

T *Thorne Associates*
123 Gray Road, Falmouth, Maine 04105
708.833.8800

SECTION 5

PUBLIC OR PRIVATE RIGHTS-OF-WAY

The City of Portland has tentatively granted acceptance to allow the easterly garage entrance to be located within the Emery Street (Paper Street) Right-of-Way. There are no additional private or public encumbrances of the development parcel.

SECTION 6

SCHEDULE

The proposed project is currently under design with a targeted construction start date of March 2020 and completion slated for early 2022.

PLAN REFERENCES

- 1) Plan of Land on West Commercial Street Maine Central Railroad to J.B. Brown & Sons by Owen Haskell, Inc. dated October 13, 2011. Recorded in Plan Book 211, Page 350.
- 2) State of Maine Department of Transportation Right of Way Map of State Highway "10" D.O.T. File No. 3-483. Sheets 16-19. Recorded in Plan Book 208, Pages 16-19.
- 3) Maine State Highway Commission Right of Way Map of State Highway "A" S.H.C. File No. 3-77. Sheets 1 & 2. Recorded in Plan Book 43, Pages 52 & 54.
- 4) Plan of West Commercial Street Alteration by City of Portland, Maine Department of Public Works dated July 1, 1952.
- 5) Street right of way plans obtained from the City of Portland Engineering Department for West Commercial Street, Emery Street, and Danforth Street.
- 6) Plans of Pollution Abatement Facilities West Commercial Street made for Portland Water District by Camp Dresser & McKee, Inc. dated April 1973 and revised through August 1981. Sheets 25-29. On file at the City of Portland Department of Engineering.
- 7) Plan of Condominium Plat, Southrise Condominium made for Coastland Corp. by Sebago Technics, Inc. dated March 13, 1989 and revised through June 2, 1989. Recorded in Plan Book 179, Page 44.
- 8) Plan of Boundary Survey made for Mark & Aimee Bessire by Owen Haskell dated September 8, 2014. Unrecorded.
- 9) Plan of Land on West Commercial Street Portland Terminal Company to J.B. Brown & Sons by Owen Haskell dated July 27, 2010. Recorded in Plan Book 210, Page 285.
- 10) Right of Way and Track Map - Portland Terminal Operated by Portland Terminal Company. Sheets VID-1 & VID-2 dated June 30, 1916. Station 0+00 to Station 105+60. On file at PanAm Railway Department of Engineering.
- 11) Plan of Property made for Constance Bloomfield by Titcomb Associates dated October 20, 2004, revised through October 5, 2005. Recorded in Plan Book 205, Page 635.
- 12) Plan of ALTA/ACSM Land Title Survey - 113 West Commercial Street, made for J.B. Brown & Sons by Titcomb Associates dated February 9, 2016.

NOTES

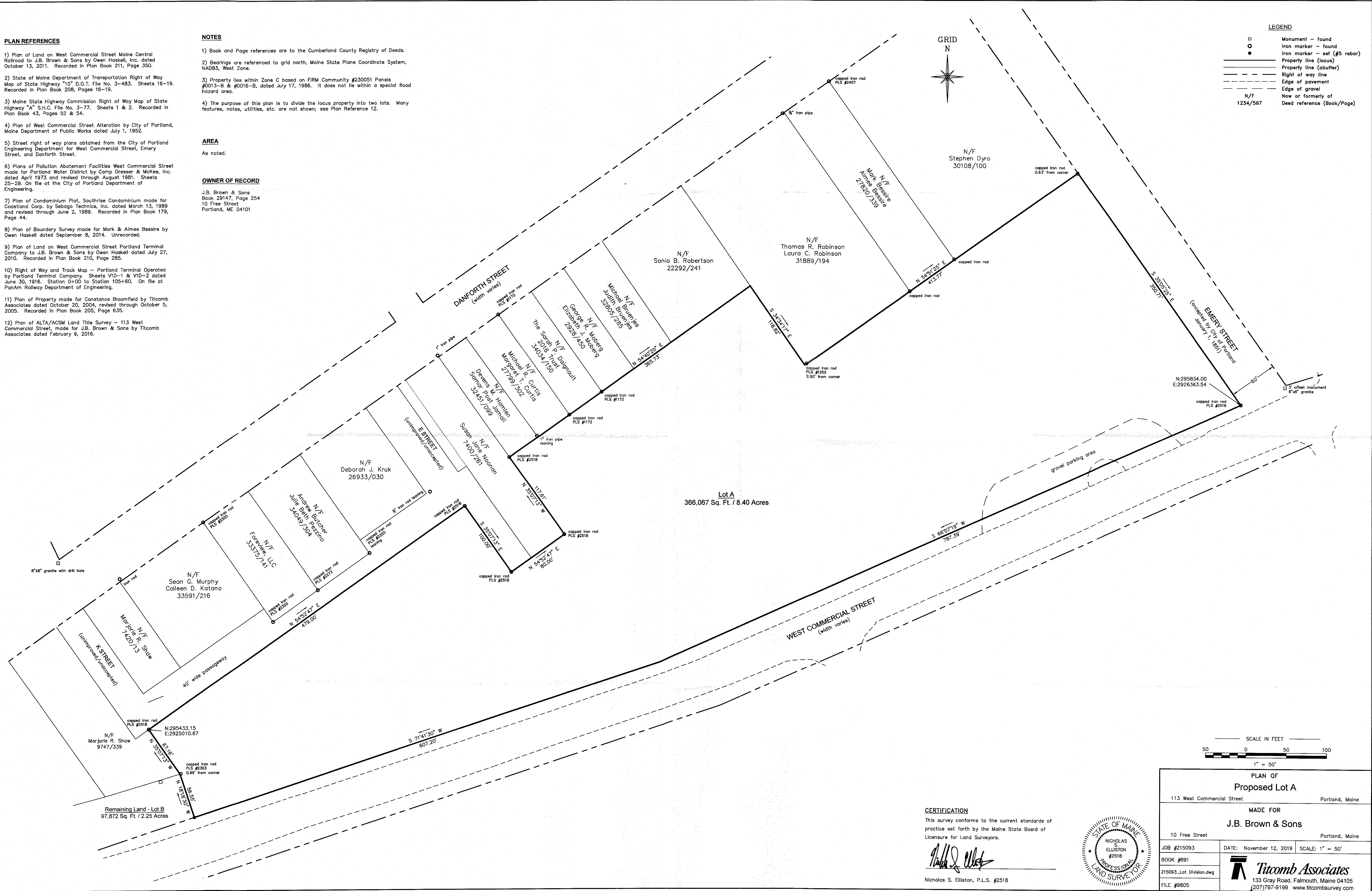
- 1) Book and Page references are to the Cumberland County Registry of Deeds.
- 2) Bearings are referenced to grid north, Maine State Plane Coordinate System, NAD83, West Zone.
- 3) Property lies within Zone C based on FIRM Community #230051 Panels #0015-B & #0016-B, dated July 17, 1986. It does not lie within a special flood hazard area.
- 4) The purpose of this plan is to divide the locus property into two lots. Many features, notes, utilities, etc. are not shown; see Plan Reference 12.

AREA

As noted.

OWNER OF RECORD

J.B. Brown & Sons
Book 29147, Page 254
10 Free Street
Portland, ME 04101



LEGEND

- Monument - found
- Iron marker - found
- Property line (locus)
- Property line (abutter)
- Right of way line
- Edge of pavement
- Edge of gravel
- Now or formerly of
- Deed reference (Book/Page)

N/F
1234/567

PLAN OF Proposed Lot A

113 West Commercial Street Portland, Maine

MADE FOR

J.B. Brown & Sons

10 Free Street Portland, Maine

JOB #215093	DATE: November 12, 2019	SCALE: 1" = 50'
BOOK #891		
215093_Lot Division.dwg		
FILE #9805		

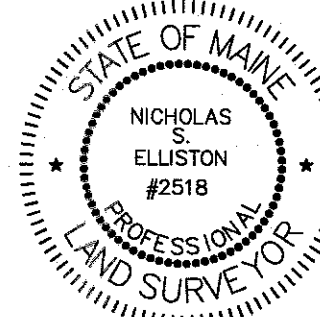
Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com

CERTIFICATION

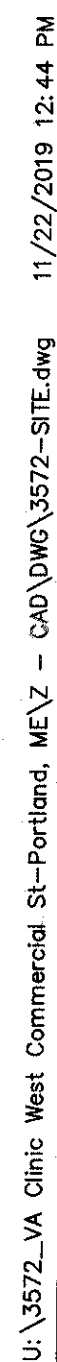
This survey conforms to the current standards of practice set forth by the Maine State Board of Licensure for Land Surveyors.

Nicholas S. Elliston

Nicholas S. Elliston, P.L.S. #2518



1.	EXISTING ZONE:	B5b - Urban Commercial Mixed-Use Zone R-4 - Residential Zone
2.	PARCEL SIZE:	8.40 ACRES
3.	SPACE AND BULK:	
		<u>REQUIRED / ALLOWED</u>
		<u>PROVIDED</u>
	MAXIMUM LOT COVERAGE	100%
	MAXIMUM BUILDING HEIGHT	55 FT. (62 FT. FOR ROOFTOP PROJECTIONS)
	MINIMUM LOT SIZE	NONE
	MINIMUM SIDE YARD	NONE
	MINIMUM REAR YARD	NONE
	MINIMUM FRONTAGE	NONE
	MAXIMUM FRONT YARD BUILDING SETBACK	10 FT.
4.	PARKING REQUIREMENT:	
	MEDICAL OFFICE - 1 SPACE/400SF	
	PROPOSED OUTPATIENT CLINIC 62,300 SF	156 SPACES
		400± SPACES



LEVEL III SITE PLAN APPLICATION	11.15.19	SRB	
Issued For	Date	By	



**GORRILL
PALMER**

Drawing Name:	OVERALL SITE LAYOUT PLAN
Project:	U.S. Department of Veterans Affairs – Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No. **C-40**

TRAFFIC IMPACT STUDY

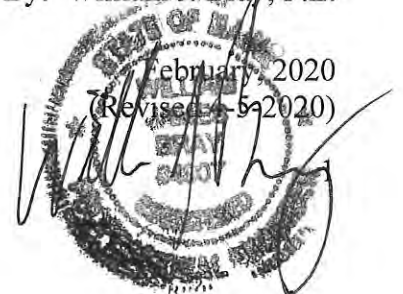
FOR

PROPOSED

Department of Veterans Affairs

“Community Based Outpatient Clinic”

Prepared For: J.B. Brown & Sons
Prepared By: William J. Bray, P.E.



INTRODUCTION

FDS JBB Portland, LLC are proposing to construct a 62,170 square foot two-story building on an 8.40-acre site located at 113 West Commercial Street. The Federal Department of Veterans Affairs (VA) will lease the proposed building creating a Community Based Outpatient Clinic. The proposed development includes a total of 532 on-site parking spaces with 150 surface parking spaces and 382 spaces within a three-level garage structure. The VA's lease agreement requires the applicant to provide a total of 400 on-site parking spaces to meet their programming needs. The remaining 132 unencumbered parking spaces within the proposed parking garage are presently being considered for accommodating existing parking needs of marine dependent businesses located along the Portland Waterfront.

There will be three primary driveways into the site from West Commercial Street. All three driveways are proposed to be unsignalized. The westerly driveway will provide primary access for staff/employees to the 150-space surface parking lot. Staff parking is located on the west side of the building to provide convenient access to the proposed building, as staff entry is differentiated from patient/visitor access into the building. The central driveway is the primary patient/visitor access route and it is located between the clinic building and the proposed site garage to allow for ease of patient access to the clinic building, as well as, vehicular movements in/out of the garage. The most easterly driveway is located east of the parking structure and will provide access for entering and exiting movements out of the garage. The driveway also provides for emergency and heavy vehicle movements around the garage and to the rear of the parking structure avoiding conflicts with other site uses through the westerly and central access driveways.

It is expected that each of the three driveways will require a separate left-turn lane treatment for entry movements to the site from West Commercial Street. These lanes and the projected volumes of traffic through them are not expected to significantly overlap with left-turn movements into the Canal Landing Boat facility. The Canal Landing site design also provides three points of access onto West Commercial Street with the central and far westerly driveways infrequently used and carrying limited traffic volumes. The most easterly driveway into the boat yard is located approximately 250-feet east of the proposed parking garage. The Canal Landing traffic volumes are very low and are not expected to conflict with traffic generated by the proposed clinic site.

The proposed project requires the applicant to receive approval for a Traffic Movement Permit (TMP) and Planning Board approval from the City of Portland. A TMP application was filed with the City on December 3, 2019 followed by a project scoping meeting conducted on Monday, December 30, 2019. The City's Traffic Consultant, at that time, identified a full traffic impact study would be required in support of the permit application.

The City's Traffic Consultant and Planning Staff determined the study area would include the following intersections:

- Commercial Street @ Beach Street
- West Commercial Street @ Cassidy Point Drive
- West Commercial Street @ Valley Street
- Valley Street/St. John Street and Danforth Street
- West Commercial Street @ Fore River Parkway

The traffic study requirements were further defined as follows:

- There was concurrence that the 10th edition of the ITE "**TRIP GENERATION**" manual was reasonable to use for the study. The City's Traffic Consultant advised that the State Traffic Engineer has authorized use of the 10th edition in the conduct of this traffic impact study.

- The Applicant will provide additional information on employee levels, current information on patients, etc. This item will be addressed under separate cover.
- Given the magnitude of difference between the Peak Hour of Adjacent Traffic and Generator, the traffic analysis is to include a sensitivity analysis of how the higher trip level may impact traffic operations.
- Other development projects to be included in the required traffic impact study to include the following development sites: 383 Commercial Street, Canal Landing, 184 Commercial Street, EWTMP, 58 Fore Street, Portland Square, MMC, Mercy Hospital, Thompson Point and Portland Transportation Center.
- The applicant shall provide backup data that supports the assignment (employee residence). There was a request to gain an understanding of patient origins as part of this analysis. This item will be addressed under separate cover.
- The application identified one HCL location at Commercial Street and Beach Street and it was requested that 2019 data be reviewed and mitigation strategies be identified. It was also requested that the crashes at the West Commercial Street/Valley Street intersection be reviewed.

EXISTING TRAFFIC

Existing Design Hour Traffic: Manual traffic turning movement counts were collected during both weekday peak commuter hours at four traffic intersections located within the general vicinity of the proposed site. The locations and the date of the data collection are listed as follows:

1. Commercial Street @ Beach Street – August 13, 2019
2. West Commercial Street @ Fore River Parkway – August 14, 2019
3. West Commercial Street @ Valley Street – August 15, 2019
4. West Commercial Street @ Cassidy Point Drive – 1-9-2020

All traffic entering and exiting each intersection was recorded in 15-minute intervals between 7:00 and 9:00 a.m. and, again, between 3:00 and 6:00 p.m. (Copies of the traffic data is attached as an appendix to the report). From a summary of the data, it was determined that the “*morning*” peak hour falls between 7:30 and 8:30 a.m. at each of the four study intersections and the “*evening*” peak hour occurs between either 4:30 and 5:30 or 4:45 and 5:45 p.m. at each of the noted study intersections.

Traffic data collected during the months of July and August is generally representative of “peak” travel conditions and further adjustment is not required.

Traffic data collected during the months of September through June typically requires an adjustment to reflect “*peak*” travel conditions found during the summer months of July and August. The traffic data collected at Location #4, West Commercial Street @ Cassidy Point Drive, was collected to only establish entry and exit volumes from Cassidy Point Drive; through traffic volumes in both directions on West Commercial Street were based upon traffic data collected at the West Commercial Street/Valley Street intersection during August 2019.

Figure 1 illustratively depicts the estimated 2019 Design Hour Traffic conditions at each of the five study intersections.

TRAFFIC SAFETY

Existing Safety Trends: MaineDOT's Accident Records Section provided the latest three-year (2016 through 2018) crash data for the section of West Commercial Street between Beach Street and the Fore River Parkway, a distance of 1.40 miles. MaineDOT's report is presented as follows:

Table 1
2016 -2018 Traffic Accident Summary

<u>Location</u>	<u>Total Crashes</u>	<u>Critical Rate Factor</u>
1. West Commercial Street @ Valley Street	26	0.75
2. West Commercial Street @ Beach Street	30	1.17
3. West Commercial Street @ Cassidy Point Drive	5	0.37
4. West Commercial Street btw. Fore River Parkway and Valley Street	3	0.29
5. West Commercial Street btw. Valley Street and Cassidy Point Drive	1	0.27
6. West Commercial Street near Benny's Diner	2	0.65
7. West Commercial Street btw. gravel turnout and Beach Street	12	0.51

The MaineDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:

- ***8 or more accidents***
- ***A Critical Rate Factor greater than 1.00***

Commercial Street/Beach Street/IMT Entrance: As the data presented in the table shows, the intersection of West Commercial Street and Beach Street meets both of MaineDOT's criteria for identification of a high crash location, with a total of 30 crashes and a corresponding critical rate factor of 1.17. MaineDOT provided a detailed vehicle collision diagram for the intersection that maps the crash patterns of each of the 30 vehicle collisions. That document visually presents two very distinct crash patterns occurring within the intersection; 18 crashes are "rear-end" crashes involving thru vehicles on both approaches of West Commercial Street colliding with a second vehicle traveling in the same direction. A second crash pattern were "angle" collisions with a total of four incidences involving a motorist turning left from the eastbound approach of West Commercial Street to Beach Street struck by a thru vehicle traveling westbound through the intersection.

2019 crash data was obtained from the MaineDOT for the Commercial Street/Beach Street intersection to further understand and evaluate the higher than expected frequency of traffic crashes reported for the intersection.

The MaineDOT updated (2017 through 2019) crash data for the Commercial Street/Beach Street intersection shows a very minor reduction in the number of crashes at the intersection (28 crashes vs. 30 crashes), and a minor change in the critical rate factor (1.09 vs. 1.17). The crash patterns presented in the more current crash data continue to show a high number of "rear-end" crashes (17 crashes) and a slight up-tick in the number of "angle" crashes with a total of 7 crashes. The MaineDOT crash diagram identifies that 13 of the 28 vehicle crashes occurred during either the morning or afternoon peak commuter hours, when traffic loadings are at peak conditions.

Traffic Solutions conducted a detailed review of traffic operations within the intersection to identify any plausible mitigation measures that potentially could improve traffic safety conditions within the intersection. The following findings and/or recommendations summarize that effort:

Operational Observations

- The average travel speeds of motorists traveling east on Commercial Street appears well in excess of the posted speed limit of 30mph.

- Drivers turning left from Commercial Street onto Beach Street during the permissive signal phase routinely complete the desired turn using very short vehicle gaps, oftentimes forcing westbound thru Commercial Street traffic to either slow or stop in the intersection. Very few motorists attempting the desired left-turn are able to complete the turn safely during the evening peak hour with the excessively heavy traffic volumes traveling westbound on Commercial Street.
- Motorists on the Beach Street approach make a right-turn on red onto Commercial Street using very short vehicle gaps in the thru traffic stream.
- Motorists turning left from Commercial Street onto Beach Street were found “running the red light” generally during each traffic signal cycle, creating numerous near misses with opposing traffic. This observed safety condition is clearly affirmed with the high number of reported left-turn crashes occurring at the intersection.

Recommended Mitigation Measures

- Prohibit “*Right-Turn on Red*” turns from the Beach Street approach.
- Add a “*Red Signal Ahead*” Advance Traffic Light Warning Road Sign on the outside of the curve on the east approach of Commercial Street.
- Add improved directional sign on West Commercial Street in advance of the left-turn lane to Beach Street providing approaching drivers with clear destination information; such as, Casco Bay Bridge Left-Lane, Old Port Area Thru Lane.
- Long Term the City may want to consider changing the permissive/protected signal phase for left-turns to Beach Street to address the number of crashes involving left-turn movements in the intersection.

West Commercial Street @ Valley Street: Traffic safety conditions reported by MaineDOT for the study intersection of West Commercial Street and Valley Street shows a total of 26 vehicle crashes occurred at the intersection between the years of 2016 through 2018. Although this location doesn’t meet MaineDOT’s criterion as a high crash location, the City Reviewers requested a review of the intersection to determine what possible mitigation measures could be implemented to reduce the high number of traffic crashes occurring within the intersection. The primary crash pattern in the intersection; again, similar to the findings at the Beach Street intersection is “*rear-end*” crashes with a total of 9 crashes; a second crash pattern with a total of 6 crashes were “*angle*” crashes and a final crash pattern with a total of 5 reported crashes were “*side-swipe*” crashes involving motorists traveling in either the dual left-turn or right-turn lanes in the intersection.

This location doesn’t currently meet MaineDOT’s criterion as a high crash location, however, the number of reported crashes is somewhat excessive. Traffic Solutions has conducted a field review of existing traffic operations and provided a listing of possible mitigation measures for consideration.

Operational Observations

- The dual left-turn lanes on the West Commercial Street approach unknowingly direct approaching drivers unfamiliar with the area into a possible lane entrapment condition at the connecting signalized intersection at St. John Street @ Valley Street.
- White painted “*dot-lines*” guiding turning traffic through the intersection are not present in either the dual left-turn or right-turn lanes. Drivers using both dual lanes routinely were observed straddling both turn lanes. This driver action occasionally creates near misses with aggressive approaching drivers.
- Lane markings on the Valley Street approach at West Commercial Street do not extend to the St. John Street intersection, which creates confusion as to the required lane utilization on the approach.

Recommended Mitigation Measures

- Stripe white “dot-dash” lines through the intersection for both the dual left and right-turn traffic movements. This proposed striping improvement coupled with the following signing recommendation could potentially limit the number of side-swipe crashes occurring in the intersection.
- The City working with MaineDOT should consider adding advance directional lane utilization sign messages that inform approaching drivers which of the dual left-turn lanes to use in advance of the St. John Street/Danforth Street intersection.
- The entire length of the Valley Street approach at West Commercial Street extending back to the St. John Street intersection should be striped with white lane use and symbol markings.
- The City may want to consider adding additional lane use symbols on all approaches to better inform approaching drivers of the intended lane uses on each intersection approach.

SITE TRAFFIC

Site Trip Generation - Community Based Outpatient Clinic: Trip generation for the proposed Veterans Affairs Clinic project is based upon tables presented in the 10th edition⁽¹⁾ of the Institute of Transportation’s Engineers “TRIP GENERATION” manual. The following trip rates were applied in that effort:

Land-Use Code 630 – Clinic [62,170 square foot building]

Weekday Street Peak Hour – AM Peak	= 3.69 trips/1,000sf
Weekday Street Peak Hour – PM Peak	= 3.28 trips/1,000sf
Weekday Peak Hour of Site – AM Peak	= 5.22 trips/1,000sf
Weekday Peak Hour of Site – PM Peak	= 4.64 trips/1,000sf

- (1) **NOTE:** MaineDOT requires the use of trip tables presented in the 7th edition of the ITE publication for estimating all trip generation for development projects requiring a Traffic Movement Permit. The earlier publication provides very minimal peak hour trip generation data for a clinic site; as a result, trip data in the 10th edition was applied. This process was reviewed with the State Traffic Engineer and approved for site trip calculation purposes.

Table 2, below, provides a summary of the trip generation for the proposed Community Based Outpatient Clinic project:

Table 2
Peak Hour Trip Generation Summary

<u>Peak Hour Time Period</u>	<u>Peak Hour Trip Generation</u>
AM Peak Hour (Street)	229 trips
PM Peak Hour (Street)	204 trips
AM Peak Hour (Generator)	325 trips
PM Peak Hour (Generator)	288 trips

As highlighted in the preceding Table 2, the proposed Veterans Administration’s Community Based Outpatient Clinic (CBOC) development is expected to generate a total of **229** trips during the morning street peak hour and a slightly less volume of trips (**204** trips) in the evening peak hour of the street. Site trip projections for both the morning and afternoon peak hours of the clinic site are somewhat higher at 325 trips mid-morning of a typical weekday and 288 trips mid-afternoon of the proposed site.

Site Trip Generation – Extra Parking Garage Trips (Existing Marine Dependent Businesses): The remaining 132 unencumbered parking spaces within the proposed parking garage are presently being considered for accommodating existing parking needs of marine dependent businesses located along the Portland Waterfront. Trips generated by occupants of these parking spaces will most likely arrive and depart the parking structure during times of the day or evening other than the peak hours of a typical weekday. However, to project a “worse-

case” condition, trips generated by these extra garage spaces have been estimated based upon existing peak hour parking trends found at an existing waterfront parking garage. The parking garage data shows that approximately 33% of the garage capacity enters or exits the structure in the AM peak hour with a directional split of 89% entering the garage and 11% exiting. The parking trends found in the evening peak hour are similar but reversed from the AM trends, with approximately 27% of the garage capacity entering or exiting the garage. The PM peak hour distribution shows about 14% of the PM trips enter and 86% exit the parking garage. These trip patterns were applied in estimating the existing garage trips that potentially will be generated by the extra (132) garage spaces in the proposed garage. Accordingly, the extra garage spaces can be expected to generate a total of 44 trips in the AM peak hour and 36 spaces in the evening peak hour. Thirty-nine of the morning trips and five of the afternoon trips will enter the garage and the remaining trips (5 AM peak and 31 PM peak) will exit.

Vehicle Trip Composition: This report has assumed all vehicle trips generated by the proposed VA Clinic site are “primary” or “new” vehicle trips to the area street network. Trips generated by the existing marine dependent businesses are existing trips presently circulating along the Commercial Street corridor, as such, their actual traffic impacts are limited to the most easterly driveway entrance to the proposed parking structure.

Site Trip Distribution VA Clinic Site: The 10th Edition of the Institute of Transportation Engineers “TRIP GENERATION” publication provides the following trip distributions rates for a proposed clinic site:

Land-Use Code 630 – Clinic

AM Peak Hour Street)	= 78% enter/22% exit
PM Peak Hour (Street)	= 29% enter/71% exit
AM Peak Hour (Generator)	= 58% enter/42% exit
PM Peak Hour (Generator)	= 46% enter/54% exit

Table 3, as follows, summarizes the peak hour directional distributional volumes for the proposed CBOC site:

Table 3
Site Trip Distribution Summary

<u>Peak Hour Time period</u>	<u>CBOC Building Trip Distribution Volumes</u>		<u>Total Trips</u>
	<u>Enter</u>	<u>Exit</u>	
AM Peak Hour (Street)	179 trips	50 trips	229 trips
PM Peak Hour (Street)	59 trips	145 trips	204 trips
AM Peak Hour (Generator)	189 trips	136 trips	325 trips
PM Peak Hour (Generator)	132 trips	156 trips	288 trips

Accordingly, in the morning peak hour of the street, the heaviest volume of trips (179 trips) enter the site and in the evening peak hour a reverse pattern occurs with 145 trips exiting the site. The remaining trips (50 trips) in the morning peak hour will exit the site and 59 trips in the evening peak hour enter the site.

Projected trip patterns occurring during the mid-morning and mid-afternoon peak hours of the site are estimated at 189 trips entering the site in the mid-morning peak hour and 156 trips exiting the site in the mid-afternoon peak hour. The remaining balance of 136 trips in the morning peak hour exits the site and the remaining trips (132 trips) in the afternoon peak hour enters the site.

Site Trip Distribution – Existing Marine Dependent Businesses: Parking operational data gathered for an existing parking structure located in the Eastern Waterfront section of the City provides the following existing distribution patterns for the 132 parking garage spaces:

AM Peak Hour – Total of 44 Trips
39 trips enter/5 trips exit

PM Peak Hour – Total of 36 Trips
5 trips enter/31 trips exit

Vehicle Trip Assignment – Proposed VA Clinic Site: The Department of Veterans Affairs provided general residency information for employees presently working at the 144 Fore Street facility in the City of Portland that shows the majority of employees reside in Portland, South Portland, Yarmouth and Falmouth. They have also advised that the expected service area of the proposed Clinic will encompass the majority of Cumberland and York counties.

A population-based traffic model was considered an appropriate instrument for assigning site generated traffic to the study area intersections. The site travel model includes the 2010 Census population of 17 municipalities generally located in the Greater Portland Area that have a combined 2010 population of 277,240 persons. Communities located both south and north of the Greater Portland Area were purposely omitted from the model development, understanding Veterans currently have other clinical options located both north and south of the proposed Portland site.

The travel model process divides the 2010 population value of each community by the total population of the 17 municipalities (277,240) and assigns the resultant percent value; either partially or fully, to one of four general travel routes to the proposed Clinic site: 1) Fore River Parkway; 2) Veterans Parkway; 3) Commercial Street East and 4) Casco Bay Bridge.

Table 4 presents the results of the population-based trips model process. As highlighted on the noted table, approximately 47% of the site trips will use the Fore River Parkway to access the proposed Clinic site; 33% will travel across the Veterans Bridge to access the site and about 11% of the site traffic will use Commercial Street from the east while the remaining 9% will use the Casco Bay Bridge for access. The trip assignment process also includes further minor trip adjustments directing lesser volumes of trips through the Valley Street/St. John Street/Danforth Street intersection. These minor trip adjustments were generally based upon existing vehicle splits found at the study intersection during both peak hour time periods.

Table 4
Population Based Model
Travel Assignment Summary
VA Community Based Outpatient Clinic

<u>Community Name</u>	<u>2010 Population</u>	<u>Percent of Total</u>	<u>Site Trip Assignment (Percentage)</u>			
			<u>Fore River Pkwy.</u>	<u>Veterans Bridge</u>	<u>Commercial Street (E)</u>	<u>Casco Bay Bridge</u>
Portland	66,193	23.9	15	-	8.9	-
Scarborough	18,910	6.8	-	6.8	-	-
South Portland	25,004	9.0	-	3.5	-	5.5
Cape Elizabeth	9,013	3.3	-	-	-	3.3
Falmouth	11,180	4.0	3.5	-	0.5	-
Westbrook	17,515	6.3	4.8	0.5	-	-
Cumberland	7,203	2.6	2.0	-	1.0	-
Freeport	7,878	2.8	2.8	-	0.6	-
Windham	16,997	6.1	6.1	-	-	-
Gorham	16,371	5.9	4.8	1.0	-	-
N. Yarmouth	3,573	1.3	1.3	-	-	-
Yarmouth	8,350	3.0	3.0	-	-	-
Standish	9,872	3.6	3.6	-	-	-
Saco	18,482	6.7	-	6.7	-	-
Biddeford	21,277	7.7	-	7.7	-	-

Kennebunk	10,798	3.9	-	3.9	-	-
Old Orchard Beach	8,624	3.1	-	3.1	-	-
TOTAL			46.9%	33.3%	11.0%	8.8%
	277,240	100%	80.2%		19.8%	

Site Trip Assignment – Existing Marine Dependent Businesses: These trips are existing trips presently traveling the Commercial Street corridor. Trips generated by these existing businesses, again, were directionally assigned through the most easterly garage driveway entrance applying the general directional assignment paths presented in Table 4 above. The trip assignment for these existing trips require minor adjustments to the projected through volumes along Commercial Street. Minor volumes of through trips were appropriately reduced for the AM peak hour and increased in the PM peak hour.

Figures 2a and 2b illustratively present traffic assignments, respectively, for the morning and evening peak hours of the street.

Site Trip Assignment – Peak Hour of Generator (Sensitivity Analysis): A trip assignment was prepared representing trip generation for both the AM and PM peak hour of the generator in conducting the requested sensitivity analysis. Table 2, above, establishes the volume of AM and PM peak hour trips generated by the proposed project during the AM and PM peak hour of the site (generator). The trip projections are shown as follows:

AM Peak Hour = 325 trips

PM Peak Hour = 288 trips

These vehicle trips were then assigned through the study intersections applying the directional travel routing information presented in the preceding Table 4.

Figures 2c and 2d present the trip assignments prepared for the AM and PM peak hours of the site (generator), respectively.

2022 PRE- AND POST-DEVELOPMENT TRAVEL FORECASTS

Other Development Traffic: Traffic generated by projects that have been approved by the local Planning Board and/or the Maine Department of Transportation, yet are not opened, must be included in the estimate of pre-development traffic. The City has advised that trips generated by the following projects must be included as other development trips through the study intersections:

<i>383 Commercial Street</i>	<i>58 Fore Street</i>
<i>Canal Landing</i>	<i>Portland Square</i>
<i>184 Commercial Street</i>	<i>MMC</i>
<i>EWTMP</i>	<i>Mercy Hospital</i>
<i>Thompson's Point</i>	<i>Portland Transportation Center</i>

Site trips generated by each of these listed development sites were appropriately assigned through the study intersections and these assignments are illustratively highlighted on Figure 3.

2022 Design Hour Traffic: The VA Clinic project is expected to be completed in 2022; therefore, 2019 design hour traffic volumes shown on Figure 1 require an annual adjustment to forecast 2022 travel conditions at each of the study intersections. Annual growth rates of less than 1% per year have been applied in recent development projects in the City. Traffic Solutions has applied a more conservative 1% growth adjustment in projecting 2022

travel conditions at the study intersections. Figure 4 illustratively presents the estimated 2022 design hour traffic volumes for the study intersections.

2022 Pre-Development Traffic: Future 2022 pre-development travel conditions were prepared for the study intersections by combining the Other Development traffic presented on Figure 3 with the 2022 Design Hour traffic forecasts presented on Figure 4. Figure 5 presents the estimated 2022 pre-development travel forecasts for the study intersections.

2022 Post-Development Traffic: Separate 2022 post-development traffic assignments were prepared for: 1) Peak Hour of the Street Conditions and 2) Peak Hour of the Generator Travel Conditions (Sensitivity Analysis). Figures 6a and 6b illustratively present the 2022 post-development traffic forecasts for the former travel period during the AM and PM peak hours, respectively, and Figures 7a and 7b highlight the projected 2022 post-development assignments for the peak hours of the generator travel conditions.

MOBILITY ANALYSIS

Capacity analyses of 2022 Pre- and Post-development traffic conditions forecast for each study intersection were conducted utilizing the Synchro and Sim Traffic computer traffic models. Two 2022 post-development travel conditions were analyzed: 1) peak hour trip generation projected for the peak hours of the street and 2) peak hour trip generation representative of the peak hour of the generator (sensitivity analysis). Lastly, traffic operations at each of the three proposed driveway entrances to the proposed site were evaluated, again, for both defined travel conditions.

Levels of Service rankings are similar to the academic grading system, where an “A” is very good with little delay and “F” represents very poor conditions.

The following table summarizes the relationship between delay and Level of Service for a signalized intersection:

Level of Service Criteria for Signalized Intersections

<u>Level of Service</u>	<u>Total Control Delay (sec/veh)</u>
A	Up to 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	Greater than 80.0

Each of the five study intersections for the 2022 pre-development condition were evaluated based upon existing intersection geometry and traffic signal timing and phasing inputs. The analyses conducted for both 2022 post-development conditions, again, are based upon existing intersection geometry, signal timing and optimization of signal timing inputs. Table 5, as follows, provides the results of the capacity analyses conducted for each of the five signalized study intersections for both the 2022 pre- and post-development travel conditions:

Table 5
Signalized Intersection Capacity Analysis
2022 Pre- and Post-Development Conditions

	2022 Pre-Development						2022 Post-Development Peak Hour Volumes (Street)						2022 Post-Development Peak Hour Volumes (Generator)					
	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS	
Intersection /Approach																		
1. Commercial St./Beach St./IMT Ent.																		
- Commercial St. WB	20 sec	B		92 sec	F		23 sec	C		91 sec	F		24 sec	C		90 sec	F	
- Commercial St. EB	20 sec	B		76 sec	E		11 sec	B		63 sec	E		11 sec	B		76 sec	E	
- Beach St. SB	23 sec	C		50 sec	D		18 sec	B		53 sec	D		20 sec	B		53 sec	D	
- IMT Ent. NB	18 sec	B		93 sec	F		39 sec	D		115 sec	F		28 sec	C		133 sec	F	
- Overall	20 sec	B		81 sec	F		16 sec	B		74 sec	E		16 sec	B		81 sec	F	
2. W. Commercial St. @ Cassidy Point Dr.																		
- W. Commercial St. WB	2 sec	A		3 sec	A		3 sec	A		11 sec	B		2 sec	A		17 sec	B	
- W. Commercial St. EB	28 sec	C		11 sec	B		17 sec	B		8 sec	A		26 sec	C		8 sec	A	
- Cassidy Point Dr. NE	5 sec	A		12 sec	B		10 sec	A		12 sec	B		13 sec	B		19 sec	B	
- Overall	19 sec	B		7 sec	A		12 sec	B		9 sec	A		17 sec	B		12 sec	B	
3. Fore River Pkwy/W. Commercial St./Valley St.																		
- W. Commercial St. WB	30 sec	C		57 sec	E		18 sec	B		99 sec	F		18 sec	B		111 sec	F	
- Fore River Pkwy EB	26 sec	C		26 sec	C		17 sec	B		25 sec	C		17 sec	B		31 sec	C	
- Valley St. SB	9 sec	A		15 sec	B		12 sec	B		15 sec	B		12 sec	B		16 sec	B	
- Overall	24 sec	C		33 sec	C		16 sec	B		46 sec	D		16 sec	B		53 sec	D	
4. Veterans Bridge @ Fore River Pkwy																		
- Veterans Bridge EB	13 sec	B		15 sec	B		13 sec	B		14 sec	B		13 sec	B		16 sec	B	
- Fore River Pkwy WB	9 sec	A		22 sec	C		8 sec	A		20 sec	B		8 sec	A		21 sec	C	
- Fore River Pkwy SB	36 sec	D		33 sec	C		40 sec	D		34 sec	C		40 sec	D		61 sec	E	
- Overall	14 sec	B		20 sec	B		15 sec	B		20 sec	B		15 sec	B		24 sec	C	
5. Valley St./St. John St./Danforth St.																		
- Valley St. NB	6 sec	A		14 sec	B		7 sec	A		15 sec	B		7 sec	A		14 sec	B	
- Valley St. SB	24 sec	C		73 sec	E		29 sec	C		61 sec	E		27 sec	C		48 sec	D	
- St. John St. EB	27 sec	C		38 sec	D		28 sec	C		48 sec	D		26 sec	C		41 sec	D	
- Danforth St. WB	33 sec	C		34 sec	C		34 sec	C		38 sec	D		34 sec	C		39 sec	D	
- Overall	20 sec	B		30 sec	C		21 sec	C		33 sec	C		20 sec	B		31 sec	C	

Each of the five study intersections are expected to operate overall at acceptable levels of service in the morning peak hour under projected 2022 pre-development travel conditions. Vehicle delay values less than 25 seconds were determined for each study intersection, which is representative of Level of Service C travel conditions - an acceptable level of service. Similar results are forecast for the PM peak hour at four of the five locations (Locations 2 thru 5), where overall traffic operations meet acceptable levels of service. Vehicle delay values less than 35 seconds were calculated for each of the four identified study intersections. Traffic operation results determined for the final intersection at Commercial Street/Beach Street and the IMT Driveway entrance location are significantly different; whereby, thru traffic in both directions on Commercial Street will experience excessive vehicle delay, typical of Level of Service E/F travel conditions.

The 2022 post-development analysis evaluates two travel assignments: 1) 2022 Post-Development (Street Volumes) and 2) 2022 Post-development (Generator Volumes) for both peak hour time periods. The simulation model results show traffic operations in the morning peak hour for both travel assignment conditions are very similar to the results determined for the 2022 pre-development travel conditions. ***[The Reader is cautioned that the post-development results reflect traffic signal timing optimization at each of the five study intersections. These traffic signal timing adjustments help minimize the overall traffic impacts generated by the added site traffic.]*** Each intersection in the morning peak hour, under both described traffic loadings, will operate overall at Level of Service C or better travel conditions. Conditions found in the evening peak hour are also very similar to the results determined for the 2022 pre-development evening peak hour. Vehicle delay and level of service values determined for locations 2 thru 5 meet and/or exceed Level of Service C/D travel conditions. Again, traffic conditions measured for Location #1: Commercial Street/Beach Street/IMT Driveway Entrance intersection show excessive vehicle delay is expected under both travel conditions. Notably, thru traffic traveling westbound on Commercial Street will experience average vehicle delays of 90 seconds or more in the evening peak hour under both travel assignment conditions.

Post-development travel conditions at each of the three unsignalized site driveway intersections with West Commercial Street were evaluated assuming dual (left and right) exit lanes on each of the three driveway approaches and construction of a Center Two-Way Left-Turn Lane on Commercial Street for accommodating left-turn entry traffic to each driveway entrance. Two travel conditions were evaluated; 2022 Post-Development (Street Volumes) Condition and 2022 Post-Development (Generator Volumes) Condition.

The following table summarizes the relationship between delay and Level of Service for an unsignalized intersection:

Level of Service Criteria for Unsignalized Intersections

<u>Level of Service</u>	<u>Total Control Delay (sec/veh)</u>
A	Up to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

The results of the dual analyses conducted for each of the three proposed site driveway intersections are presented in the following Table 6:

Table 6
Site Driveways
Unsignalized Intersection Capacity Analysis
2022 Post-Development

Site Driveway/Approach	2022 Post-Development Peak Hour Volumes (Street)				2022 Post-Development Peak Hour Volumes (Generator)			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Employee Surface Lot								
- W. Commercial St. EB	8 sec	A	4 sec	A	10 sec	A	5 sec	A
- W. Commercial St. WB	3 sec	A	4 sec	A	3 sec	A	8 sec	A
- Driveway SB	10 sec	A	42 sec	E	12 sec	B	57 sec	F
- Overall	6 sec	A	5 sec	A	7 sec	A	7 sec	A
2. Main Garage Entrance								
- W. Commercial St. EB	3 sec	A	5 sec	A	3 sec	A	4 sec	A
- W. Commercial St. WB	1 sec	A	2 sec	A	1 sec	A	2 sec	A
- Garage Entrance SB	12 sec	B	26 sec	D	13 sec	B	34 sec	D
- Overall	2 sec	A	4 sec	A	3 sec	A	4 sec	A
3. Secondary Garage Entrance								
- W. Commercial St. EB	2 sec	A	3 sec	A	2 sec	A	3 sec	A
- W. Commercial St. WB	5 sec	A	5 sec	A	5 sec	A	5 sec	A
- Garage Entrance SB	13 sec	B	25 sec	C	12 sec	B	26 sec	D
- Overall	3 sec	A	4 sec	A	3 sec	A	5 sec	A

The preceding Table 6 demonstrates that each of the proposed site driveway intersections at W. Commercial Street will meet and exceed the parameters for Level of Service A travel conditions during each of the four post-development travel conditions. Motorists exiting through each of the three site driveways during both evening peak hour conditions are delayed in completing both left and right exit movements onto W. Commercial Street. Vehicle delay values of 34 seconds or less were determined from the site driveway exit lanes onto W. Commercial Street at both the Main and Secondary Driveway entrances; traffic exiting through the employee surface lot will experience greater levels of delay under both evening travel conditions.

VEHICLE QUEUE ASSESSMENT

A vehicle queuing analysis was conducted using the SimTraffic microsimulation traffic software. The model was set up in a manner that vehicles exiting left out of the three site driveways would use the CTWLTL before merging with EB Commercial Street through traffic. Generally, the model shows that for the post-development scenarios (as well as the model using trip generation based on the generator peak hour traffic) 95th percentile queues of 2 to 3 car lengths in each critical entry and exit lane. The exception occurs at the employee surface lot in the AM peak hour where left-turn entry trips to the parking lot peak at around 337-feet. Adequate vehicle storage should be provided in the CTWLTL lane of at least 300-feet to ensure sufficient storage is provided to accommodate the expected vehicle queue.

Post-Development AM

Location	W. Commercial Street EB Left-Turn Entry	Driveway Left-Turn Exit Lane	Driveway Right-Turn Exit Lane
Secondary Entrance	59	15	32
Employee Entrance	237	17	41
Main Entrance	54	18	42

Post-Development AM - Generator

Location	W. Commercial Street EB Left-Turn Entry	Driveway Left-Turn Exit Lane	Driveway Right-Turn Exit Lane
Secondary Entrance	54	28	43
Employee Entrance	337	31	55
Main Entrance	59	33	50

Post-Development PM

Location	W. Commercial Street EB Left-Turn Entry	Driveway Left-Turn Exit Lane	Driveway Right-Turn Exit Lane
Secondary Entrance	32	32	60
Employee Entrance	131	39	84
Main Entrance	37	33	64

Post-Development PM - Generator

Location	W. Commercial Street EB Left-Turn Entry	Driveway Left-Turn Exit Lane	Driveway Right-Turn Exit Lane
Secondary Entrance	49	34	64
Employee Entrance	113	35	110
Main Entrance	70	42	82

SIGHT DISTANCE

The City of Portland's Technical Standards require the following sight distance standards for a non-mobility roadway:

Sight Distance Standards

Speed Limit	Sight Distance
25 mph	200 feet
30	250
35	305
40	360
45	425
50	495
55	570

West Commercial Street is currently posted at 40mph across a portion of the frontage of the proposed site, with the remaining section posted at 30mph. The City's Technical Standards require an unobstructed sight distance of 250-feet for a posted speed limit of 30mph and 360-feet for a 40mph speed limit. A clear line-of-sight in excess of 500-feet was measured "looking" in both directions from each of the three proposed driveway entrances to the site.

SUMMARY

1. The proposed Veterans Administration's Community Based Outpatient Clinic (CBOC) development is expected to generate a total of **229** trips during the morning street peak hour and a slightly less volume of trips (**204** trips) in the evening peak hour of the street. Site trip projections for both the morning and afternoon

peak hours of the clinic site are somewhat higher at 325 trips mid-morning of a typical weekday and 288 trips mid-afternoon of the proposed site.

2. An additional 44 trips in the morning peak hour and 36 trips in the evening peak hour are also generated by the surplus parking spaces in the proposed parking garage. The site design creates an additional 132 parking spaces not required by the Veterans Administration CBOC project. These extra parking spaces are currently being considered for accommodating existing parking needs of existing marine dependent businesses located along the Portland Waterfront. Trips generated by occupants of these extra site parking spaces, which will ingress and egress the proposed garage structure through the most easterly garage entrance, are existing trips presently found on Commercial Street. It is very likely that most of these vehicle trips occur during times other than the peak travel times of a typical day. However, to project a “*worse-case*” condition, trips generated by these extra garage spaces have been appropriately combined with the peak hour trip totals for proposed VA Clinic site.
3. MaineDOT’s Accident Records Section provided the latest three-year (2016 through 2018) crash data for the section of West Commercial Street between Beach Street and the Fore River Parkway. The road safety data identifies a single intersection as a high crash location. MaineDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:
 - **8 or more accidents**
 - **A Critical Rate Factor greater than 1.00**

As the data presented in the table shows, the intersection of West Commercial Street and Beach Street meets both of MaineDOT’s criteria for identification of a high crash location with a total of 30 crashes and a corresponding critical rate factor of 1.17. MaineDOT provided a detailed vehicle collision diagram for the intersection that maps the crash patterns of each of the 30 vehicle collisions. That document visually presents two very distinct crash patterns occurring within the intersection; 18 crashes are “rear-end” crashes involving through vehicles on both approaches of West Commercial Street colliding with a second vehicle traveling in the same direction. A second crash pattern were “angle” collisions with a total of four incidences involving a motorist turning left from the eastbound approach of West Commercial Street to Beach Street stuck by a thru vehicle traveling westbound through the intersection. Further review of this intersection was completed based upon safety data provided by MaineDOT for the study years of 2017 through 2019. The more current safety data shows a similar but slightly lower number of crashes (28) and a lower critical rate factor of 1.09 than the data presented for the 2016 thru 2018 study period.

Further review of traffic operations within the intersection were conducted to determine if intersection geometry and/or driver behaviors were potentially impacting the higher than expected level of traffic crashes. The findings of the field review show:

- Average travel speeds of motorists traveling east on Commercial Street appear well in excess of the posted speed limit of 30mph.
- Drivers turning left from Commercial Street onto Beach Street during the permissive signal phase routinely complete the desired turn using very short vehicle gaps, oftentimes forcing westbound thru Commercial Street traffic to either slow or stop in the intersection.
- Very few motorists attempting the desired left-turn onto Beach Street are able to complete the turn safely during the evening peak hour with the excessively heavy traffic volumes traveling westbound on Commercial Street.
- Motorists on the Beach Street approach make a right-turn on red onto Commercial Street using very short vehicle gaps in the thru traffic stream.
- Motorists turning left from Commercial Street onto Beach Street were found “running the red light” generally during each traffic signal cycle, creating numerous near misses with opposing

traffic. This observed safety condition is clearly affirmed with the high number of reported left-turn crashes occurring at the intersection.

Traffic Solutions would recommend four possible mitigation measures that with implementation, may potentially improve existing safety conditions.

Recommended Mitigation Measures

- Evaluate the long-term safety benefits of converting the Eastbound Commercial Street permissive/protected Beach Street left-turn traffic signal phase to a protected signal phase, only.
- Prohibit “*Right-Turn on Red*” turns from the Beach Street approach.
- Add a “*Red Signal Ahead*” Advance Traffic Light Warning Road Sign on the outside of the curve on the east approach of Commercial Street.
- Add improved directional signage on West Commercial Street in advance of the left-turn lane to Beach Street providing approaching drivers with clear destination information; such as, Casco Bay Bridge Left-Lane, Old Port Area Thru Lane.

West Commercial Street @ Valley Street Intersection: A detailed safety review of this signalized intersection was completed as directed by the City Staff and Traffic Peer Review Consultant. Although this location doesn’t currently meet MaineDOT’s criterion as a high crash location, the number of reported crashes is somewhat excessive. MaineDOT’s most recent 2016 through 2018 report shows a total of 26 vehicle crashes occurred at the intersection. The primary crash pattern occurring in the intersection; again, similar to the findings at the Beach Street intersection, is “*rear-end*” crashes with a total of 9 crashes. A second crash pattern with a total of 6 crashes were “*angle*” crashes and a final crash pattern with a total of 5 reported crashes were “*side-swipe*” crashes involving motorists traveling in either the dual left-turn or right-turn lanes in the intersection.

Traffic Solutions conducted a field review of existing conditions at the intersection with the following comments:

- The dual left-turn lanes on the West Commercial Street approach lead approaching drivers unfamiliar with the area into a possible lane entrapment condition at the connecting signalized intersection at St. John Street @ Valley Street.
- White painted “*dot-lines*” guiding turning traffic through the intersection are not present in either the dual left-turn or right-turn lanes. Drivers using both dual lanes routinely were observed unknowingly straddling both lanes. This driver action occasionally creates near misses with aggressive approaching drivers.
- Lane markings on the Valley Street approach at West Commercial Street do not extend to the St. John Street intersection, which creates confusion as to the required lane utilization on the approach.

Traffic Solutions suggests the following possible mitigation measures for improving safety conditions at the intersection.

- Stripe white “*dot-dash*” lines through the intersection for both the dual left and right-turn traffic movements. This proposed striping improvement coupled with the following signing recommendation could potentially limit the number of side-swipe crashes occurring in the intersection.
- The City working with MaineDOT should consider adding advance directional lane utilization sign messages that inform approaching drivers which of the dual left-turn lanes to use in advance of the St. John Street/Danforth Street intersection.
- The entire length of the Valley Street approach at West Commercial Street extending back to the St. John Street intersection should be striped with appropriate white lane and symbol markings.

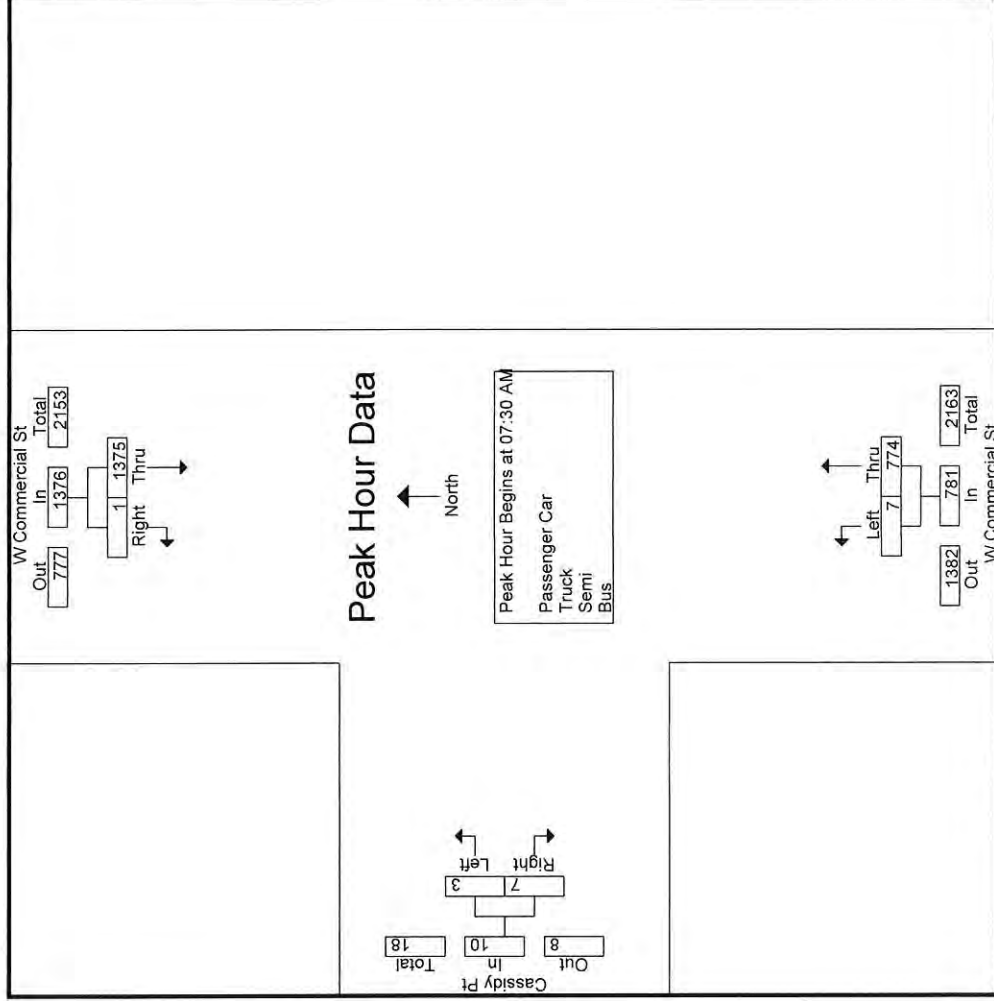
- The City may want to consider adding additional lane use symbols on all approaches to better inform approaching drivers of the intended lane uses on each intersection approach.
4. Each of the five study intersections are expected to operate overall at acceptable levels of service in the morning peak hour under projected 2022 pre-development travel conditions. Similar results are forecast during the PM peak hour at four of the five locations (Locations 2 thru 5), where overall traffic operations meet acceptable levels of service. Traffic operation results determined for the final intersection at Commercial Street/Beach Street and the IMT Driveway entrance location are significantly different; whereby, thru traffic in both directions on Commercial Street will experience excessive vehicle delay, typical of Level of Service E/F travel conditions.
 5. Two 2022 post-development travel conditions were tested to determine the expected operational impacts at each of the five study intersections. These travel conditions included: 1) 2022 Post-Development (Street Volumes) and 2) 2022 Post-development (Generator Volumes) for both peak hour time periods. The simulation model results show traffic conditions in the morning peak hour for both travel assignment conditions are very similar to the results determined for the 2022 pre-development travel conditions. ***[The reader is cautioned that the post-development results reflect traffic signal timing optimization at each of the five study intersections. These traffic signal timing adjustments help minimize the overall traffic impacts generated by the added site traffic.]*** Each intersection in the morning peak hour, under both described traffic loadings, will operate overall at Level of Service C or better travel conditions. Conditions found in the evening peak hour are also very similar to the results determined for the 2022 pre-development evening peak hour. Vehicle delay and level of service values determined for locations 2 thru 5 meet and/or exceed Level of Service C/D travel conditions. Again, traffic conditions measured for Location #1: Commercial Street/Beach Street/IMT Driveway Entrance intersection shows excessive vehicle delay is expected under both forecast travel conditions.

City Staff and Consultant asked that the traffic analyses include a sensitivity analysis of how the higher peak hour trip levels projected for the peak hour of the generator potentially impact operations at the study intersections. A second traffic assignment, which added more than 80 peak hours trips in both peak hour time periods, was tested concurrently with the analyses completed for post-development travel conditions based upon site trip generation for the street peak hour. A “side-by-side” comparison of the results of the dual 2022 post-development analyses shows that the added site trips included in the second 2022 post-development travel condition has no measurable additional impact at each of the five study intersections.

6. The results of the detailed capacity analysis completed for each of the three site driveway intersections demonstrates that acceptable levels of service are provided at each site entrance. Each driveway intersection is projected to operate at Level of Service A travel conditions. Motorists leaving the employee surface lot in the evening peak hour will experience somewhat lengthy delay in exiting onto W. Commercial Street.
7. Generally, the model shows that for the post-development scenarios (as well as the model using trip generation based on the generator peak hour traffic) 95th percentile vehicle queues of 2 to 3 car lengths are expected in each critical entry and exit lane. The exception occurs at the employee surface lot in the AM peak hour where left-turn entry trips to the parking lot peak at around 337-feet. Adequate vehicle storage should be provided in the CTWLTL lane of at least 300-feet to ensure sufficient storage is provided to accommodate the expected vehicle queue.
8. Acceptable vehicle sight distance is provided at each of the three proposed site driveway entrances. Sightline distances in excess of 500-feet was measured directionally at each of the three sight entrances.

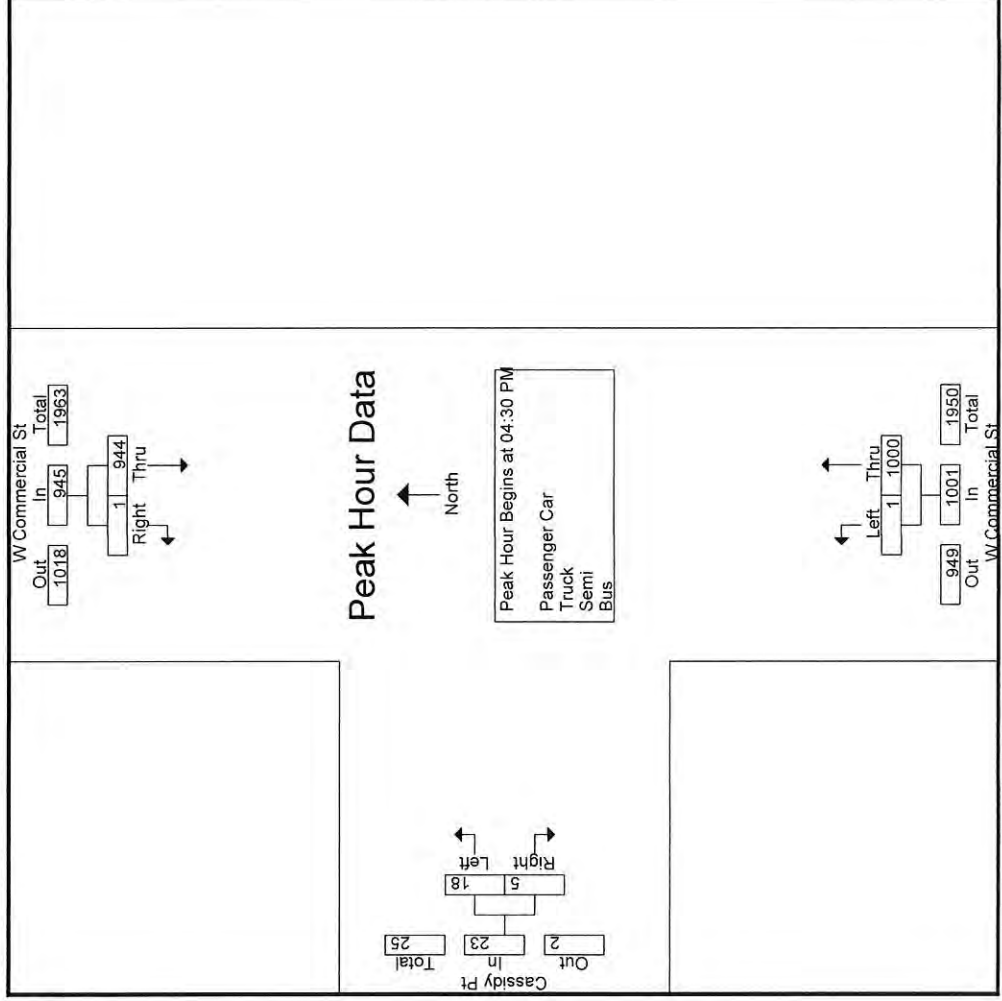
Portland W Commercial & Cassidy Pt
 January 9, 2020 AM
 Sunny
 Count by Jen Gilbert

File Name : Portland West Commercial & Cassidy Point 12-9-20 AM
 Site Code : 00109201
 Start Date : 1/9/2020
 Page No : 6



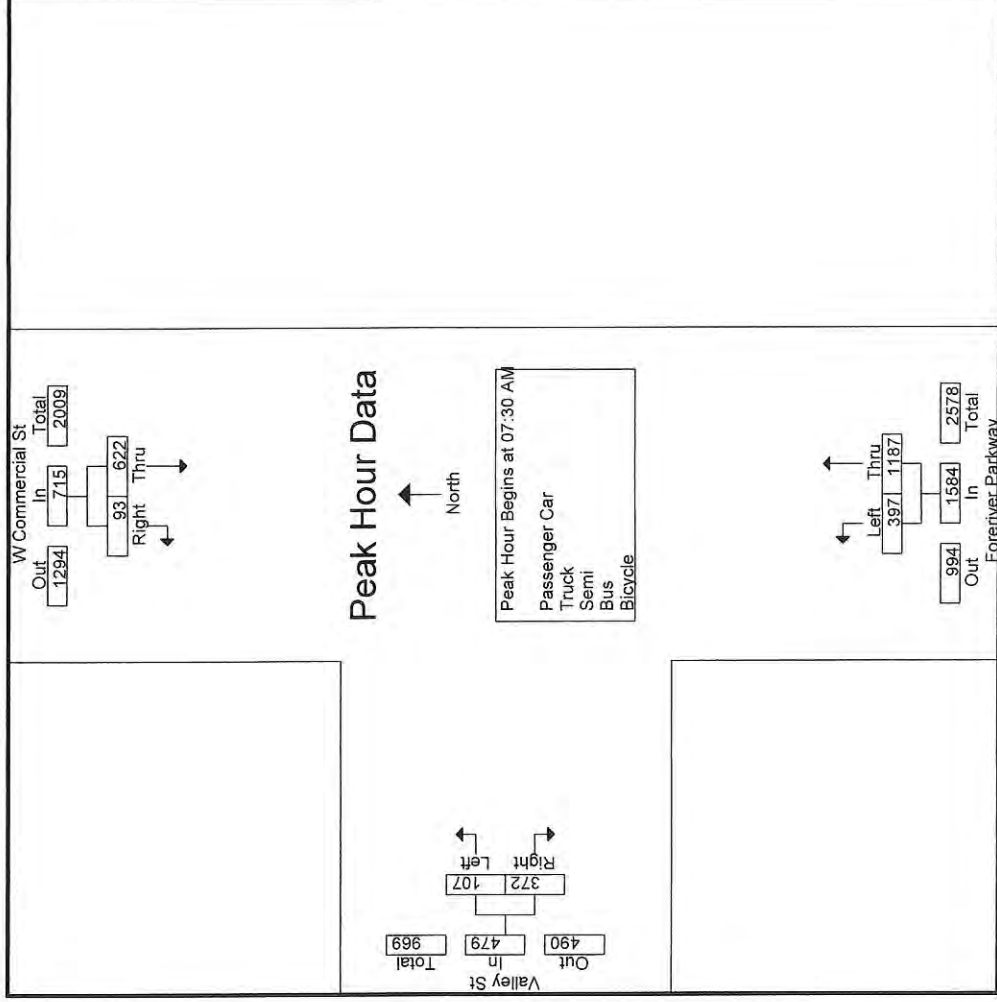
Portland W Commercial & Cassidy Pt
January 9, 2020 PM
Sunny
Count by Jen Gilbert

File Name : Portland West Commercial & Cassidy Point 12-9-20 PM
Site Code : 00109202
Start Date : 1/9/2020
Page No : 6



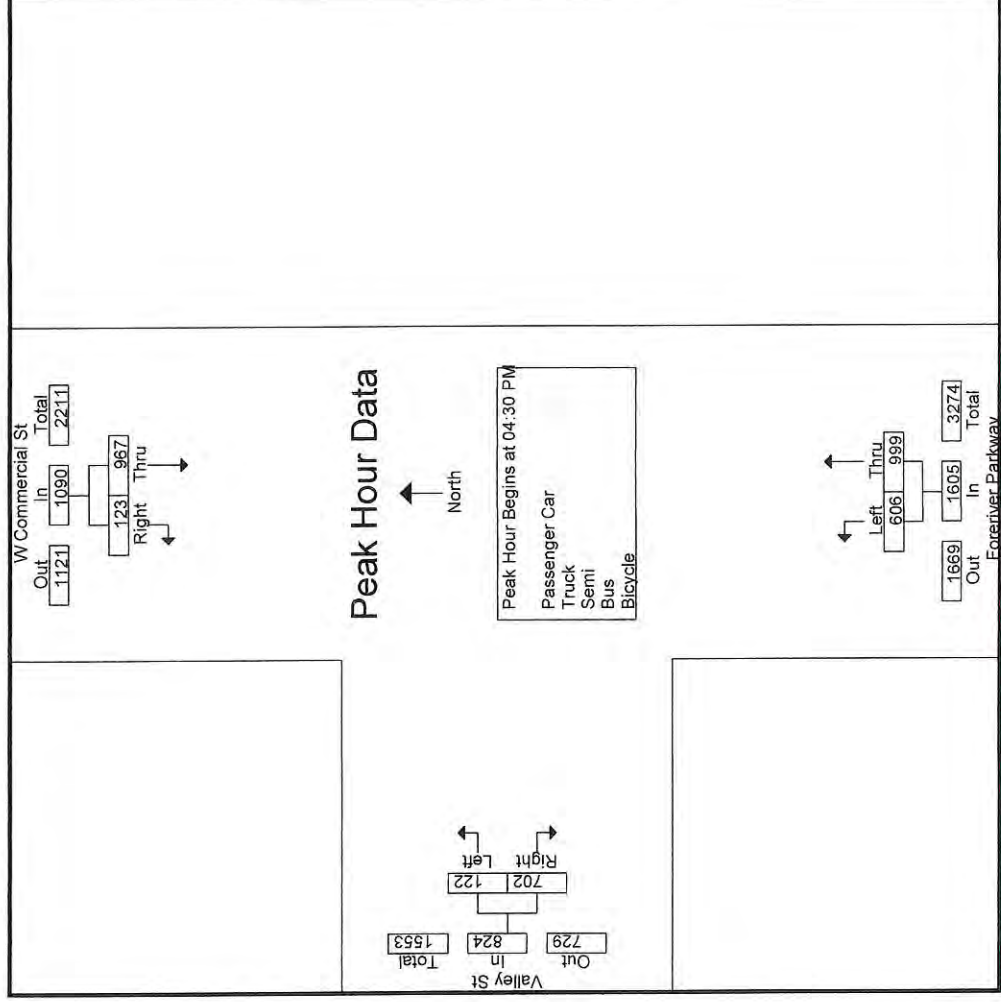
Portland Fore River, Valley & WCommercial
August 15, 2019 AM
Sunny
Count by Jen Gilbert

File Name : Portland Fore River Parkway, Valley St & W Commercial St 8-15-19 AM
Site Code : 00815191
Start Date : 8/15/2019
Page No : 6



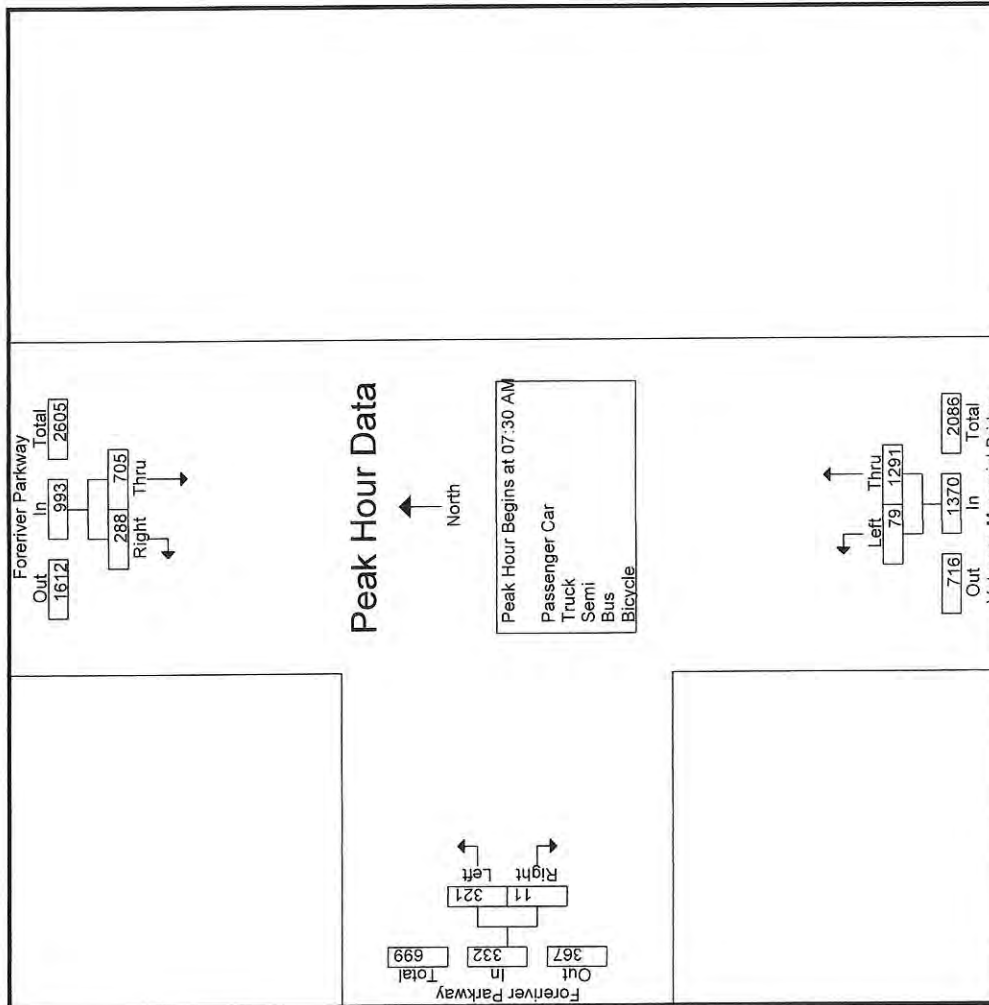
Portland Fore River, Valley & WCommerical
 August 15, 2019 PM
 Sunny
 Count by Jen Gilbert

File Name : Portland Fore River Parkway, Valley St & W Commerical St 8-15-19 PM
 Site Code : 00815192
 Start Date : 8/15/2019
 Page No : 6



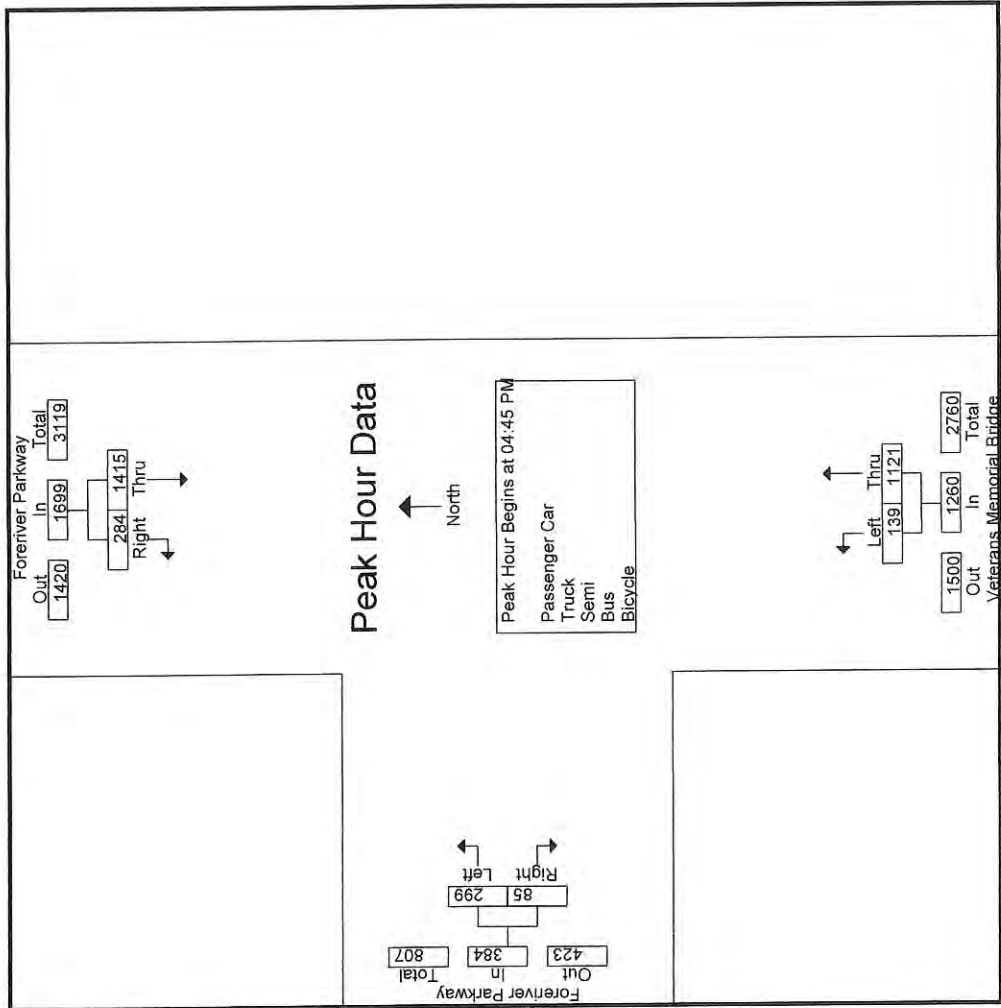
Portland Foreriver Parkway & Memorial Br
August 14, 2019 AM
Sunny
Count by Jen Gilbert

File Name : Portland Foreriver Parkway & Veterans Memorial Brid
Site Code : 00814191
Start Date : 8/14/2019
Page No : 6



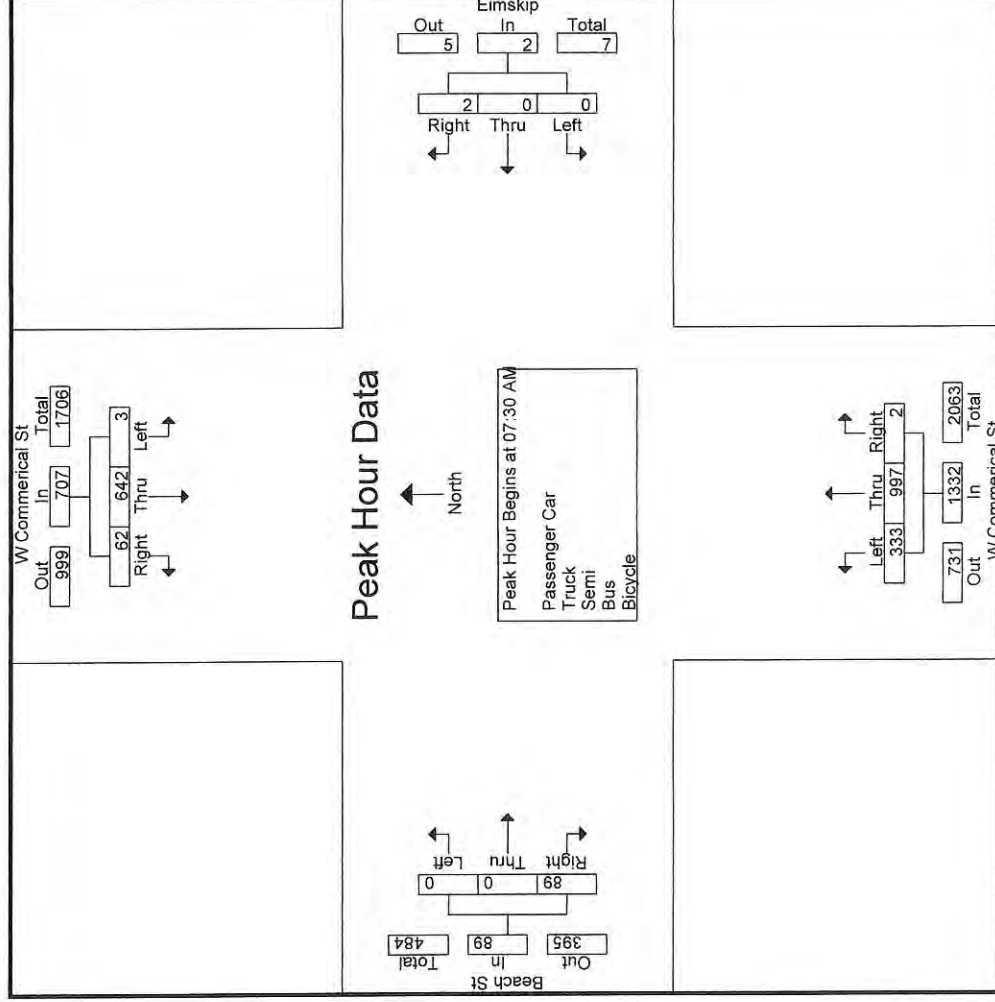
Portland Foreriver Parkway & Memorial Br
August 14, 2019 PM
Sunny
Count by Jen Gilbert

File Name : Portland Foreriver Parkway & Veterans Memorial Bridge 8-14-19 PM
Site Code : 00814192
Start Date : 8/14/2019
Page No : 6



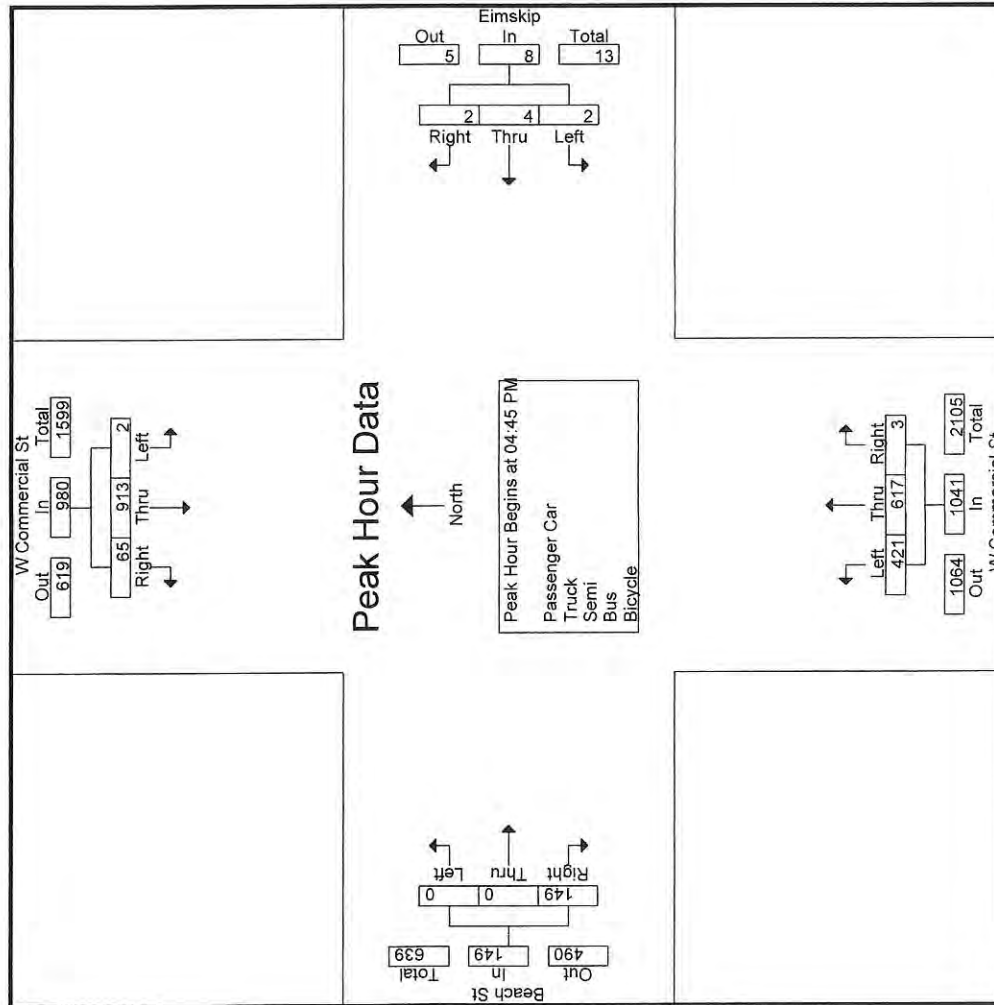
Portland W Commerical & Beach St
August 13, 2019 AM
Light Rain
Count by Jen Gilbert

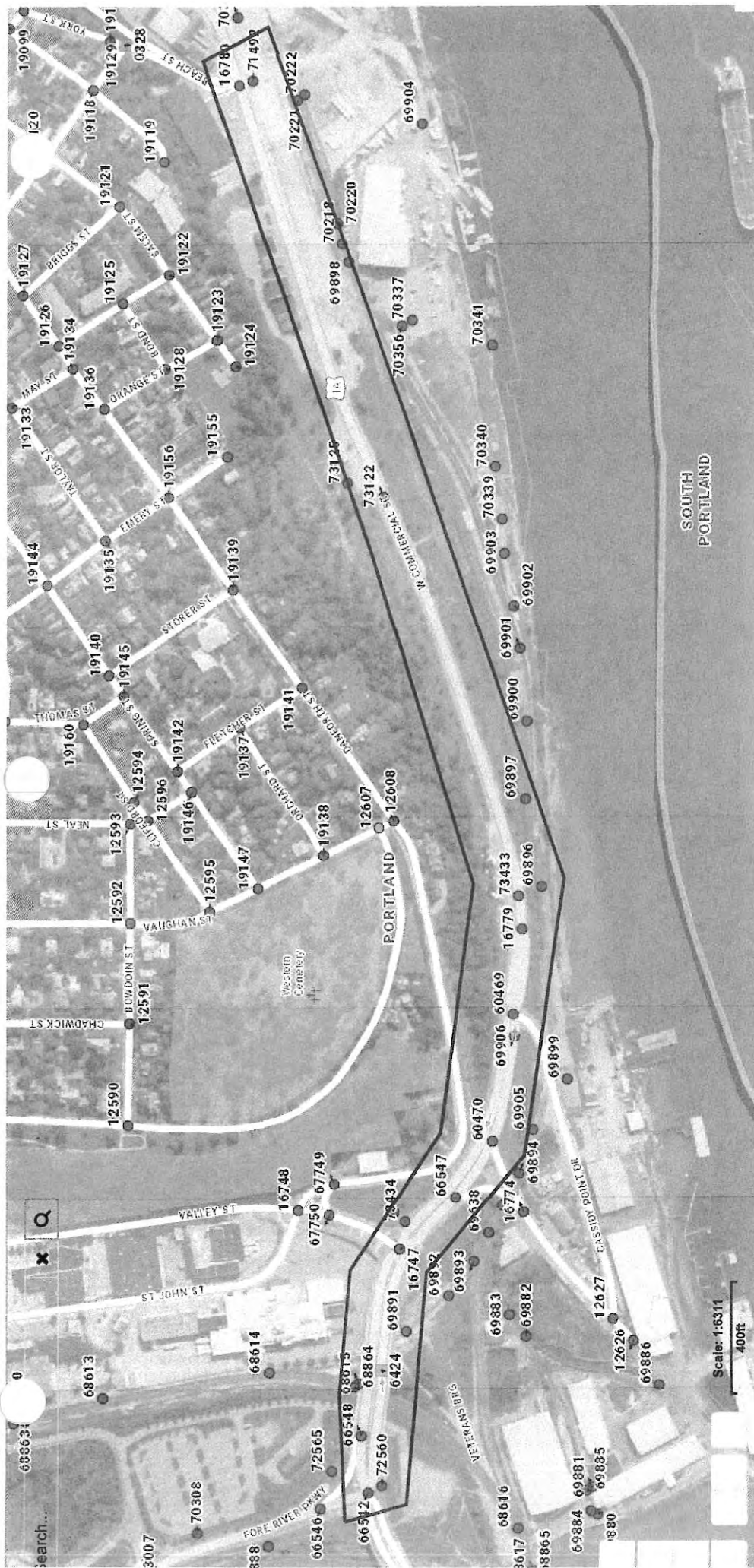
File Name : Portland W Commerical St & Beach St 8-14-19 AM
Site Code : 00813191
Start Date : 8/13/2019
Page No : 6



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 : 6





Crash Summary port**Report Selections and Input Parameters****REPORT SELECTIONS**
☒ Crash Summary I ☐ Section Detail ☒ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary
REPORT DESCRIPTION

Portland: Rte 1/W Commercial St from intersection with Fore River Pkwy/Veterans Bridge (node 66542) to intersection with Beach St (node 16780)

REPORT PARAMETERS

Year 2016, Start Month 1 through Year 2018 End Month: 12

Route: 0001A	Start Node: 66542 End Node: 16780	Start Offset: 0 End Offset: 0	☐ Exclude First Node ☐ Exclude Last Node
Route: 001AS	Start Node: 16779 End Node: 60469	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node
Route: 001AS	Start Node: 60469 End Node: 16747	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node
Route: 001AS	Start Node: 16747 End Node: 66542	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node

Crash Summary I

Nodes																
Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes			Percent Annual M			Crash Rate	Critical Rate	CRF			
					K	A	B	C	PD	Injury				Ent-Veh		
16747	0001A - 9.86	Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST	9	26	0	1	2	4	19	26.9	10.594	0.82	1.10	0.00		
											Statewide Crash Rate:	0.73				
16780	0001A - 10.69	Int of BEACH ST ENT TO PORTLAND YACHT RAMP BEACH ST	9	30	1	0	2	9	18	40.0	7.273	1.37	1.18	1.17		
											Statewide Crash Rate:	0.73				
16779	0001A - 10.10	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	7.676	0.00	0.34	0.00		
											Statewide Crash Rate:	0.15				
66547	0001A - 9.91	Int of CASSIDY POINT DR W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	4.020	0.00	0.40	0.00		
											Statewide Crash Rate:	0.15				
73122	0001A - 10.40	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.818	0.00	0.40	0.00		
											Statewide Crash Rate:	0.15				
66542	0001A - 9.70	Int of FORE RIVER PKY VETERANS BRIDGE	9	12	0	0	0	1	11	8.3	9.466	0.42	1.13	0.00		
											Statewide Crash Rate:	0.73				
60469	0001A - 10.04	Int of CASSIDY POINT DR W COMMERCIAL ST	9	5	0	0	0	1	4	20.0	7.894	0.21	1.16	0.00		
											Statewide Crash Rate:	0.73				
60470	0001A - 9.95	Int of CASSIDY POINT DR W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.976	0.00	0.40	0.00		
											Statewide Crash Rate:	0.15				
73433	0001A - 10.12	Non Int W COMMERCIAL ST	2	0	0	0	0	0	0	0.0	3.818	0.00	0.40	0.00		
											Statewide Crash Rate:	0.15				
66548	001AS - 2.59	Int of FORE RIVER PKY RD INV 3209586	2	0	0	0	0	0	0	0.0	5.487	0.00	0.37	0.00		
											Statewide Crash Rate:	0.15				
Study Years: 3.00				NODE TOTALS:		73	1	1	4	15	52	28.8	64.022	0.38	0.59	0.64

Crash Summary I

Sec

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section U/R Length	Total 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	3	0	0	0	1	2	0.00788	126.95	441.67	0.00
Int of FORE RIVER PKY VETERANS BRIDGE US 1A																
16747	66547	3117392	0 - 0.05	0001A - 9.86	0.05	2	1	0	0	0	1	1	0.00201	165.82	621.35	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST US 1A																
66547	60470	3510989	0 - 0.04	0001A - 9.91	0.04	2	0	0	0	0	0	0	0.00158	0.00	660.91	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST US 1A																
60470	60469	3510990	0 - 0.09	0001A - 9.95	0.09	2	1	0	0	0	1	1	0.00363	91.93	533.67	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST US 1A																
60469	16779	3121916	0 - 0.06	0001A - 10.04	0.06	2	1	0	0	0	1	1	0.00231	144.01	599.04	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST US 1A																
16779	73433	4628058	0 - 0.02	0001A - 10.10	0.02	2	2	0	0	0	2	2	0.00153	436.48	666.98	0.00
Non Int W COMMERCIAL ST US 1A																
73433	73122	4628059	0 - 0.28	0001A - 10.12	0.28	2	2	0	0	1	0	1	0.02138	31.18	358.15	0.00
Non Int W COMMERCIAL ST US 1A																
73122	16780	4364862	0 - 0.29	0001A - 10.40	0.29	2	12	0	0	1	1	10	0.02215	180.61	355.82	0.00
Non Int W COMMERCIAL ST US 1A																
16779	60469	3121919	0 - 0.06	001AS - 2.22	0.06	2	0	0	0	0	0	0	0.00227	0.00	602.24	0.00
Non Int W COMMERCIAL ST US 1AS																
60469	16747	4628063	0 - 0.18	001AS - 2.28	0.18	2	0	0	0	0	0	0	0.00739	0.00	448.24	0.00
Int of CASSIDY POINT DR W COMMERCIAL ST US 1AS																
16747	66548	3117394	0 - 0.13	001AS - 2.46	0.13	2	3	0	0	0	1	2	0.00713	140.18	451.99	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST US 1AS																
66548	66542	3121654	0 - 0.04	001AS - 2.59	0.04	2	0	0	0	0	0	0	0.00188	0.00	631.93	0.00
Int of FORE RIVER PKY RD INV 3209586 US 1AS																
Study Years:					3.00											
Section Totals:					1.40	25	0	0	0	2	3	20	0.08114	102.70	291.09	0.35
Grand Totals:					1.40	98	1	1	1	6	18	72	0.08114	402.57	415.60	0.97

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/Yacht Club

RTE # / RD #: 0001A

DATE DRAWN: 8/22/2019 DRAWN BY: Michelle

STUDY FROM: 1/1/2016

STUDY TO: 12/31/2018

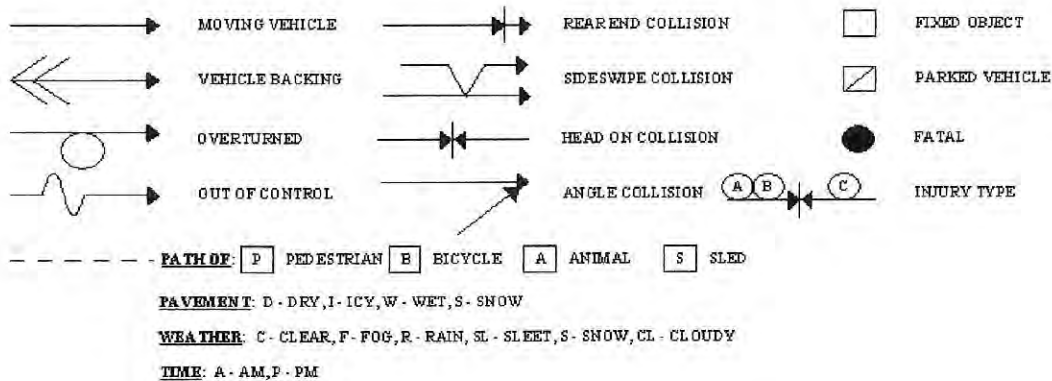
CRASH RATE: 1.37

CRF: 1.17

% INJURY: 40

TOTAL CRASHES: 30

LEGEND



Portland

Node: I6747

Study Period: 2016-2018

of Crashes: 26 / CRF: .74

Prepared by Office of Safety (MP 1/7/20)

Valley St.



Fore River Parkway

29795 9-6-16 62MP W/R Fall To Yield
5369 2-11-17 10.15A S/C Fall To Yield
8175 6-25-17 9.17A D/C Bicycle Error
8293 4-17-18 4.3MP W/C Fall To Yield
4228 1-29-16 6.15A D/C Follow Too Close
20532 1-27-18 4.55P D/C Fall To Keep in Lane

1570 1-13-17 7.65P W/R Fall To Keep in Lane
3334 8-7-17 4.65TP D/C Fall To Yield
900 1-4-17 1.00P D/C HIT & Run

3566 10-17-17 7.41A D/C Fall To Yield
24598 8-30-16 4.45P D/C Follow Too Close
5495 2-8-18 6.1MP W/C Follow Too Close
462 2-5-16 3.30P S/S Follow Too Close

308 1-2-18 7.50A D/C Fall To Keep in Lane

Median

Median

38958 12-14-17 1.47A D/C Follow Too Close
3509 1-17-18 7.50A S/S UNKNOWN
3566 12-8-16 4.45P D/C Follow Too Close
40669 12-28-17 1.25A D/C Follow Too Close
1077 1-2-18 10.04A D/C Follow Too Close

26022 8-21-17 5.30P D/C Swerve To Avoid
42074 2-17-17 1.5A D/C D/U
6257 6-10-18 10.05P D/C D/U/Ron Red Light

2403 4-8-17 10.35A D/C Fall To Keep in Lane
6029 6-15-16 9.04P D/C D/U/Ron Red Light

West Commercial St



= Traffic Signal

INTERSECTION NODE CRASH

Portland Node: 16780

Study Period: 2017-2019

PRELIMINARY CRASH DATA

of Crashes: 28 / CRF: 1.09

Prepared by Office of Safety

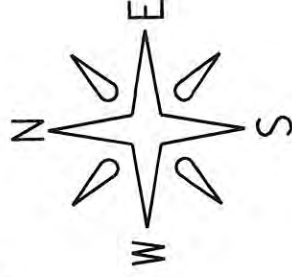
(KAG 1/8/20)

Pole

Stop

West Commercial St
Rt 1A

Beach St



20364 6-20-18 6:00P D/C Unknown

23985 8-11-17 11:20A
Oll/C Inattention

MC

12257 4-24-18 5:59P
D/C Fail To Yield



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
27334 9-11-17 4:46P D/C Follow Too Close
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
13864 5-14-18 2:45P D/C Follow Too Close

left only lane

58620 7-18-19 12:26P D/C Operated Recklessly

53394 5-30-19 8:23A D/C Follow Too Close

59705 7-22-19 4:54P W/R Distracted/Cigarette

51297 5-9-19 12:35P D/C Follow Too Close

Cement Barrier

61408 8-12-19 9:45P D/C Follow Too Close

67021 10-4-19 11:06A D/CL Distracted

28223 9-21-17 2:44P D/C Follow Too Close

74073 11-21-19 4:49P D/C Follow Too Close

11377 4-6-17 1:45A D/C Inattention

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

9879 3-24-18 4:08P D/C Fail To Yield

70246 11-4-19 6:00P D/C Fail To Yield

67023 10-4-19 2:24P D/CL Fail To Yield



= Traffic Signal



Portland Yacht Services Inc

Portland

Node: 16747

Study Period: 2016-2018

of Crashes: 26 / CRF: .74

Prepared by Office of Safety (MP 1/7/20)

Valley St.



Fore River Parkway

308 1-2-8 750A D/C Fall To Keep in Lane

Median

Median

West Commercial St

= Traffic Signal



25795 9-6-16 62P W/R Fall To Yield
5369 2-11-17 803A S/C Fall To Yield
6775 6-25-17 941TA D/C Bicycle Error
293 4-11-8 45P W/C Fall To Yield
4228 1-29-16 645A D/C Follow Too Close
20532 7-27-8 165P D/C Fall To Keep in Lane

670 1-13-17 755P W/R Fall To Keep in Lane
3334 8-7-17 45TP D/C Fall To Yield
90 1-8-17 740P D/C Hit & Run

3566 10-17-17 741A D/C Fall To Yield

24598 8-30-16 450P D/C Follow Too Close
5485 2-8-18 613P W/C Follow Too Close
4652 2-5-16 330P S/S Follow Too Close

2602 8-21-17 510P D/C Swerve To Avoid

38958 12-14-17 841TA D/C Follow Too Close
3509 1-17-18 720A S/S Unknown
3566 12-8-16 445P D/C Follow Too Close
4056 12-28-17 728A D/C Follow Too Close
1071 1-2-18 804A D/C Follow Too Close

6251 6-10-18 1005P D/C 0111/Ron Road Light
42014 2-1-17 16A D/C 0111
4243 4-8-17 1039A D/C Fall To Keep in Lane
6029 6-13-16 940P D/C 0111/Ron Road Light



34239 1-13-17 862P W/R Hit & Run

Summary of All Intervals

Run Number	1	2	3	5	6	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	3732	3855	3763	3778	3689	3764
Vehs Exited	3678	3821	3661	3686	3616	3691
Starting Vehs	160	166	157	128	144	151
Ending Vehs	214	200	259	220	217	222
Travel Distance (mi)	4045	4160	4027	4071	3951	4051
Travel Time (hr)	214.4	228.8	228.7	216.5	212.9	220.3
Total Delay (hr)	72.8	82.8	87.6	73.9	74.6	78.3
Total Stops	5869	6787	7223	5701	6227	6360
Fuel Used (gal)	148.5	153.9	150.7	149.5	145.5	149.6

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	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	5	6	Avg
Vehs Entered	3732	3855	3763	3778	3689	3764
Vehs Exited	3678	3821	3661	3686	3616	3691
Starting Vehs	160	166	157	128	144	151
Ending Vehs	214	200	259	220	217	222
Travel Distance (mi)	4045	4160	4027	4071	3951	4051
Travel Time (hr)	214.4	228.8	228.7	216.5	212.9	220.3
Total Delay (hr)	72.8	82.8	87.6	73.9	74.6	78.3
Total Stops	5869	6787	7223	5701	6227	6360
Fuel Used (gal)	148.5	153.9	150.7	149.5	145.5	149.6

1: VMB & Fore River Pkwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.5	0.0	0.1	0.3
Total Del/Veh (s)	12.5	9.2	35.7	14.2

2: Fore River Pkwy/W. Commercial & Valley St Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	25.8	30.4	8.5	24.3

3: Valley St & St. John St/Danforth Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	3.6	1.4	0.0	1.5	1.5
Total Del/Veh (s)	27.1	33.3	5.6	23.7	19.9

4: Cassidy Point & W. Commercial Performance by approach

Approach	EB	WB	NE	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	28.2	2.3	4.6	19.0

5: Ferry Terminal/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.8	0.1	0.2	0.3
Total Del/Veh (s)	19.5	19.6	18.1	22.6	19.6

Total Network Performance

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)					0.9
Total Del/Veh (s)					71.2

Intersection: 1: VMB & Fore River Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	164	323	278	188	205	238	204
Average Queue (ft)	71	183	156	89	113	151	109
95th Queue (ft)	142	288	256	163	183	217	191
Link Distance (ft)		1434	1434	768	768	1249	1249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90						
Storage Blk Time (%)	4	17					
Queuing Penalty (veh)	31	14					

Intersection: 2: Fore River Pkwy/W. Commercial & Valley St

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	232	350	500	473	323	346	98	113	126	91
Average Queue (ft)	88	182	242	208	187	214	41	43	50	34
95th Queue (ft)	176	318	435	405	299	324	79	90	94	72
Link Distance (ft)			768	768	830	830		304	304	304
Upstream Blk Time (%)			0	0						
Queuing Penalty (veh)			0	0						
Storage Bay Dist (ft)	350	350					400			
Storage Blk Time (%)			3			0				
Queuing Penalty (veh)			14			0				

Intersection: 3: Valley St & St. John St/Danforth

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	294	175	289	88	94	92	36	34
Average Queue (ft)	99	128	153	35	27	34	6	3
95th Queue (ft)	287	199	250	74	73	73	23	19
Link Distance (ft)	562		480		304	304	480	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		100		300			100	
Storage Blk Time (%)	2	22	0					
Queuing Penalty (veh)	6	0	0					

Intersection: 4: Cassidy Point & W. Commercial

Movement	EB	EB	WB	WB	NE	NE
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	735	727	117	129	22	30
Average Queue (ft)	363	308	20	21	1	4
95th Queue (ft)	817	778	77	87	13	19
Link Distance (ft)	830	830		294	548	548
Upstream Blk Time (%)	0	0				
Queuing Penalty (veh)	3	1				
Storage Bay Dist (ft)			250			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Ferry Terminal/Beach St & W. Commercial

Movement	EB	EB	B16	B16	WB	WB	NB	SB
Directions Served	L	TR	T		L	TR	R	TR
Maximum Queue (ft)	369	406	367	257	52	567	30	124
Average Queue (ft)	166	152	80	9	3	277	3	45
95th Queue (ft)	314	330	317	94	26	479	21	94
Link Distance (ft)		2975	294	294		1078	321	442
Upstream Blk Time (%)			1	0				
Queuing Penalty (veh)			11	1				
Storage Bay Dist (ft)	700				75			
Storage Blk Time (%)						27		
Queuing Penalty (veh)						1		

Network Summary

Network wide Queuing Penalty: 82

Summary of All Intervals

Run Number	1	3	4	5	6	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	4062	4111	4151	4157	4131	4123
Vehs Exited	4036	4082	4087	4075	4045	4067
Starting Vehs	180	190	185	157	161	174
Ending Vehs	206	219	249	239	247	229
Travel Distance (mi)	4232	4248	4294	4288	4208	4254
Travel Time (hr)	220.5	218.4	231.9	238.6	219.4	225.7
Total Delay (hr)	72.0	69.4	81.2	87.9	71.5	76.4
Total Stops	6353	6141	7250	7641	6334	6745
Fuel Used (gal)	155.0	154.7	159.9	160.2	154.0	156.8

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	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	3	4	5	6	Avg
Vehs Entered	4062	4111	4151	4157	4131	4123
Vehs Exited	4036	4082	4087	4075	4045	4067
Starting Vehs	180	190	185	157	161	174
Ending Vehs	206	219	249	239	247	229
Travel Distance (mi)	4232	4248	4294	4288	4208	4254
Travel Time (hr)	220.5	218.4	231.9	238.6	219.4	225.7
Total Delay (hr)	72.0	69.4	81.2	87.9	71.5	76.4
Total Stops	6353	6141	7250	7641	6334	6745
Fuel Used (gal)	155.0	154.7	159.9	160.2	154.0	156.8

1: VMB & Fore River Pkwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.4	0.0	0.1	0.2
Total Del/Veh (s)	12.6	7.5	39.8	14.7

2: Fore River Pkwy/W. Commercial & Valley St Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	16.7	18.1	11.9	16.3

3: Valley St & St. John St/Danforth Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	3.6	1.4	0.0	1.2	1.5
Total Del/Veh (s)	27.9	33.9	6.6	28.7	21.2

4: Cassidy Point & W. Commercial Performance by approach

Approach	EB	WB	NE	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	16.5	2.5	10.0	11.7

5: Ferry Terminal/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.9	0.1	0.1	0.3
Total Del/Veh (s)	11.3	22.6	39.1	18.1	15.5

15: W. Commercial & Sec. Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.5	4.5	13.3	2.7

17: W. Commercial & Employee Lot Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.8	0.0	0.1	1.2
Total Del/Veh (s)	8.4	2.5	10.4	6.4

19: W. Commercial & Main Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	2.9	1.3	12.0	2.4

Total Network Performance

Denied Del/Veh (s)	1.7
Total Del/Veh (s)	62.4

Intersection: 1: VMB & Fore River Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	165	317	310	135	151	285	253
Average Queue (ft)	74	180	163	65	90	173	144
95th Queue (ft)	149	279	262	125	136	251	223
Link Distance (ft)		1434	1434	768	768	1249	1249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90						
Storage Blk Time (%)	5	16					
Queuing Penalty (veh)	39	13					

Intersection: 2: Fore River Pkwy/W. Commercial & Valley St

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	256	286	305	324	241	272	101	176	139	106
Average Queue (ft)	103	178	149	180	131	160	40	85	70	45
95th Queue (ft)	198	257	262	292	214	243	82	150	113	83
Link Distance (ft)			768	768	830	830		304	304	304
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	350	350					400			
Storage Blk Time (%)	0		0							
Queuing Penalty (veh)	0		0							

Intersection: 3: Valley St & St. John St/Danforth

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	346	175	302	95	74	109	44	26
Average Queue (ft)	117	141	168	33	25	39	9	4
95th Queue (ft)	316	202	268	79	63	84	33	19
Link Distance (ft)	562		480		304	304	480	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		100		300				100
Storage Blk Time (%)	2	24	0				0	
Queuing Penalty (veh)	7	0	0				0	

Intersection: 4: Cassidy Point & W. Commercial

Movement	EB	EB	WB	WB	NE	NE
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	508	525	135	128	38	44
Average Queue (ft)	138	178	23	23	3	4
95th Queue (ft)	486	528	80	89	19	21
Link Distance (ft)	830	830		308	548	548
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			250			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Ferry Terminal/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	R	R
Maximum Queue (ft)	259	312	22	602	42	86
Average Queue (ft)	128	140	2	295	2	37
95th Queue (ft)	220	270	13	524	20	70
Link Distance (ft)	1239	1239		1078	321	442
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75			
Storage Blk Time (%)				30		
Queuing Penalty (veh)				1		

Intersection: 15: W. Commercial & Sec, Ent.

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	70	20	23	30
Average Queue (ft)	28	1	2	10
95th Queue (ft)	59	10	15	32
Link Distance (ft)	341	1239	465	465
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: W. Commercial & Employee Lot

Movement	EB	EB	B21	B21	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	414	474	361	340	4	29	46
Average Queue (ft)	57	214	115	156	0	3	15
95th Queue (ft)	237	592	351	386	3	17	41
Link Distance (ft)	385	385	308	308	792	515	515
Upstream Blk Time (%)	0	4	1	3			
Queuing Penalty (veh)	2	38	8	27			
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 19: W. Commercial & Main Ent.

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	57	13	29	52
Average Queue (ft)	26	1	3	15
95th Queue (ft)	54	6	18	42
Link Distance (ft)	792	341	491	491
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 136

Summary of All Intervals

Run Number	1	2	3	4	6	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	4294	4231	4158	4255	4273	4241
Vehs Exited	4216	4187	4130	4222	4177	4187
Starting Vehs	165	177	213	180	185	182
Ending Vehs	243	221	241	213	281	239
Travel Distance (mi)	4432	4394	4266	4376	4389	4371
Travel Time (hr)	239.2	244.2	235.0	238.7	243.1	240.1
Total Delay (hr)	83.9	89.3	84.8	85.0	89.1	86.4
Total Stops	7471	8063	7938	7793	7993	7852
Fuel Used (gal)	164.2	165.0	159.3	162.1	164.5	163.0

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	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	6	Avg
Vehs Entered	4294	4231	4158	4255	4273	4241
Vehs Exited	4216	4187	4130	4222	4177	4187
Starting Vehs	165	177	213	180	185	182
Ending Vehs	243	221	241	213	281	239
Travel Distance (mi)	4432	4394	4266	4376	4389	4371
Travel Time (hr)	239.2	244.2	235.0	238.7	243.1	240.1
Total Delay (hr)	83.9	89.3	84.8	85.0	89.1	86.4
Total Stops	7471	8063	7938	7793	7993	7852
Fuel Used (gal)	164.2	165.0	159.3	162.1	164.5	163.0

1: VMB & Fore River Pkwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.5	0.0	0.1	0.3
Total Del/Veh (s)	12.7	7.6	39.9	14.7

2: Fore River Pkwy/W. Commercial & Valley St Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	16.8	18.1	11.7	16.4

3: Valley St & St. John St/Danforth Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	3.6	1.4	0.0	1.2	1.4
Total Del/Veh (s)	26.3	33.5	7.0	27.4	20.4

4: Cassidy Point & W. Commercial Performance by approach

Approach	EB	WB	NE	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1
Total Del/Veh (s)	25.5	1.9	12.6	17.1

5: Ferry Terminal/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.9	0.1	0.2	0.3
Total Del/Veh (s)	11.1	24.3	28.3	20.1	16.0

15: W. Commercial & Sec. Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.5	4.6	12.0	2.7

17: W. Commercial & Employee Lot Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	3.7	0.0	0.1	2.4
Total Del/Veh (s)	9.8	2.6	12.2	7.4

19: W. Commercial & Main Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	3.3	1.4	13.0	2.8

Total Network Performance

Denied Del/Veh (s)	2.5
Total Del/Veh (s)	67.9

Intersection: 1: VMB & Fore River Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	164	340	322	160	162	267	256
Average Queue (ft)	67	184	167	68	91	177	148
95th Queue (ft)	136	286	274	131	142	250	225
Link Distance (ft)		1434	1434	768	768	1249	1249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90						
Storage Blk Time (%)	6	17					
Queuing Penalty (veh)	45	14					

Intersection: 2: Fore River Pkwy/W. Commercial & Valley St

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	279	311	344	353	296	299	109	166	149	116
Average Queue (ft)	105	175	156	188	149	181	40	77	73	49
95th Queue (ft)	210	269	270	297	247	273	84	137	123	84
Link Distance (ft)			768	768	830	830		304	304	304
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	350	350					400			
Storage Blk Time (%)	0	0	0							
Queuing Penalty (veh)	0	1	0							

Intersection: 3: Valley St & St. John St/Danforth

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	309	175	294	89	86	140	49	26
Average Queue (ft)	101	135	162	36	27	44	9	3
95th Queue (ft)	284	203	255	76	68	100	30	16
Link Distance (ft)	562		480		304	304	480	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		100		300				100
Storage Blk Time (%)	2	22	0				0	
Queuing Penalty (veh)	7	0	0				0	

Intersection: 4: Cassidy Point & W. Commercial

Movement	EB	EB	WB	WB	NE	NE
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	754	761	110	137	29	47
Average Queue (ft)	254	306	21	26	2	6
95th Queue (ft)	675	717	75	95	14	26
Link Distance (ft)	830	830		308	548	548
Upstream Blk Time (%)	0	0				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (ft)			250			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Ferry Terminal/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	R	R
Maximum Queue (ft)	246	255	41	636	54	107
Average Queue (ft)	138	116	3	322	6	37
95th Queue (ft)	227	247	25	584	32	77
Link Distance (ft)	1239	1239		1078	321	442
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75			
Storage Blk Time (%)				30		
Queuing Penalty (veh)				1		

Intersection: 15: W. Commercial & Sec, Ent.

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	69	4	37	43
Average Queue (ft)	24	0	7	18
95th Queue (ft)	54	4	28	43
Link Distance (ft)	341	1239	465	465
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: W. Commercial & Employee Lot

Movement	EB	EB	B21	B21	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	447	470	350	349	14	34	66
Average Queue (ft)	98	251	187	224	0	9	25
95th Queue (ft)	337	625	418	448	8	31	55
Link Distance (ft)	385	385	308	308	792	515	515
Upstream Blk Time (%)	1	6	2	6			
Queuing Penalty (veh)	4	56	17	56			
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 19: W. Commercial & Main Ent.

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	69	19	37	57
Average Queue (ft)	27	1	10	24
95th Queue (ft)	59	10	33	50
Link Distance (ft)	792	341	491	491
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 201

Summary of All Intervals

Run Number	1	2	4	5	7	Avg
Start Time	4:57	4:57	4:57	4:57	4:57	4:57
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	4477	4489	4368	4476	4517	4464
Vehs Exited	4366	4415	4314	4384	4328	4361
Starting Vehs	230	226	210	231	210	221
Ending Vehs	341	300	264	323	399	325
Travel Distance (mi)	4495	4497	4436	4492	4489	4482
Travel Time (hr)	404.3	381.6	408.6	433.7	443.1	414.3
Total Delay (hr)	245.2	222.3	251.6	274.6	284.3	255.6
Total Stops	9354	8874	8313	9136	10977	9334
Fuel Used (gal)	204.5	199.8	204.4	211.5	213.3	206.7

Interval #0 Information Seeding

Start Time	4:57
End Time	5:00
Total Time (min)	3
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	4	5	7	Avg
Vehs Entered	4477	4489	4368	4476	4517	4464
Vehs Exited	4366	4415	4314	4384	4328	4361
Starting Vehs	230	226	210	231	210	221
Ending Vehs	341	300	264	323	399	325
Travel Distance (mi)	4495	4497	4436	4492	4489	4482
Travel Time (hr)	404.3	381.6	408.6	433.7	443.1	414.3
Total Delay (hr)	245.2	222.3	251.6	274.6	284.3	255.6
Total Stops	9354	8874	8313	9136	10977	9334
Fuel Used (gal)	204.5	199.8	204.4	211.5	213.3	206.7

1: VMB & Fore River Pkwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.6	0.0	0.2	0.3
Total Del/Veh (s)	14.9	21.5	33.0	20.2

2: Fore River Pkwy/W. Commercial & Valley St Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	26.1	57.4	14.7	33.0

3: Valley St & St. John St/Danforth Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	3.6	1.3	0.0	3.2	1.5
Total Del/Veh (s)	37.8	34.7	13.8	73.1	29.7

4: Cassidy Point & W. Commercial Performance by approach

Approach	EB	WB	NE	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	11.3	2.9	11.7	7.4

5: Ferry Terminal/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	295.7	0.1	0.2	140.1
Total Del/Veh (s)	75.8	91.9	92.6	50.2	81.1

Total Network Performance

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)			84.1		
Total Del/Veh (s)			112.0		

Intersection: 1: VMB & Fore River Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	164	342	317	366	384	256	238
Average Queue (ft)	105	189	144	256	272	154	122
95th Queue (ft)	168	290	253	341	356	229	203
Link Distance (ft)		1434	1434	768	768	1249	1249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90						
Storage Blk Time (%)	16	18					
Queuing Penalty (veh)	113	26					

Intersection: 2: Fore River Pkwy/W. Commercial & Valley St

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	387	418	586	450	530	545	332	172	226	186
Average Queue (ft)	214	293	188	114	356	376	104	72	119	69
95th Queue (ft)	401	425	443	313	525	547	339	135	196	135
Link Distance (ft)			768	768	830	830		304	304	304
Upstream Blk Time (%)			0	0						
Queuing Penalty (veh)			0	0						
Storage Bay Dist (ft)	350	350					400			
Storage Blk Time (%)	1	8	0			11				
Queuing Penalty (veh)	8	48	0			18				

Intersection: 3: Valley St & St. John St/Danforth

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	474	175	410	156	196	303	217	159
Average Queue (ft)	205	154	230	34	79	124	63	44
95th Queue (ft)	491	206	360	98	151	242	193	109
Link Distance (ft)	562		480		304	304	480	
Upstream Blk Time (%)	1		0			0	0	
Queuing Penalty (veh)	0		0			1	0	
Storage Bay Dist (ft)		100		300				100
Storage Blk Time (%)	1	40	3				13	1
Queuing Penalty (veh)	3	2	3				7	0

Intersection: 4: Cassidy Point & W. Commercial

Movement	EB	EB	WB	WB	NE	NE
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	520	478	136	171	52	9
Average Queue (ft)	153	89	37	59	10	1
95th Queue (ft)	391	301	109	155	34	6
Link Distance (ft)	830	830		297	548	548
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			250			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Ferry Terminal/Beach St & W. Commercial

Movement	EB	EB	B15	WB	WB	NB	NB	SB
Directions Served	L	TR	T	L	TR	LT	R	TR
Maximum Queue (ft)	774	1614	67	76	1126	58	26	198
Average Queue (ft)	588	647	14	3	1066	8	2	108
95th Queue (ft)	865	2042	121	32	1270	34	17	179
Link Distance (ft)		2972	297		1078	321	321	442
Upstream Blk Time (%)		2	0		44			
Queuing Penalty (veh)		27	2		0			
Storage Bay Dist (ft)	700			75				
Storage Blk Time (%)	13	5			36			
Queuing Penalty (veh)	112	23			1			

Network Summary

Network wide Queuing Penalty: 395

Summary of All Intervals

Run Number	1	2	3	4	7	Avg
Start Time	4:57	4:57	4:57	4:57	4:57	4:57
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	4589	4660	4659	4671	4724	4662
Vehs Exited	4401	4485	4547	4518	4487	4488
Starting Vehs	203	211	241	215	193	213
Ending Vehs	391	386	353	368	430	383
Travel Distance (mi)	4608	4603	4631	4634	4658	4627
Travel Time (hr)	467.5	463.6	453.9	432.2	438.4	451.1
Total Delay (hr)	303.7	300.4	289.6	268.0	273.5	287.0
Total Stops	10906	10703	10217	9230	10939	10396
Fuel Used (gal)	220.4	221.1	219.0	213.7	217.8	218.4

Interval #0 Information Seeding

Start Time	4:57
End Time	5:00
Total Time (min)	3
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	7	Avg
Vehs Entered	4589	4660	4659	4671	4724	4662
Vehs Exited	4401	4485	4547	4518	4487	4488
Starting Vehs	203	211	241	215	193	213
Ending Vehs	391	386	353	368	430	383
Travel Distance (mi)	4608	4603	4631	4634	4658	4627
Travel Time (hr)	467.5	463.6	453.9	432.2	438.4	451.1
Total Delay (hr)	303.7	300.4	289.6	268.0	273.5	287.0
Total Stops	10906	10703	10217	9230	10939	10396
Fuel Used (gal)	220.4	221.1	219.0	213.7	217.8	218.4

1: VMB & Fore River Pkwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.6	0.0	0.2	0.3
Total Del/Veh (s)	14.2	20.1	34.1	19.5

2: Fore River Pkwy/W. Commercial & Valley St Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	25.1	98.5	15.1	46.3

3: Valley St & St. John St/Danforth Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	6.3	1.6	0.0	2.8	2.3
Total Del/Veh (s)	48.0	38.0	14.5	60.7	32.7

4: Cassidy Point & W. Commercial Performance by approach

Approach	EB	WB	NE	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	7.6	10.7	12.4	9.1

5: Ferry Terminal/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	312.6	0.1	0.2	147.7
Total Del/Veh (s)	63.2	91.0	115.1	52.8	74.4

15: W. Commercial & Sec. Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	2.8	5.2	25.3	4.4

17: W. Commercial & Employee Lot Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	4.6	4.2	41.7	5.3

19: W. Commercial & Main Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	5.4	1.5	26.1	4.1

Total Network Performance

Denied Del/Veh (s)	86.4
Total Del/Veh (s)	124.9

Intersection: 1: VMB & Fore River Pkwy

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	165	325	294	382	410	30	282	254
Average Queue (ft)	100	179	145	246	264	1	153	127
95th Queue (ft)	168	276	246	329	344	21	228	203
Link Distance (ft)		1434	1434	768	768	768	1249	1249
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	90							
Storage Blk Time (%)	15	16						
Queuing Penalty (veh)	110	23						

Intersection: 2: Fore River Pkwy/W. Commercial & Valley St

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	387	423	601	466	780	805	475	163	264	270
Average Queue (ft)	205	277	158	156	575	595	293	72	124	78
95th Queue (ft)	390	413	456	374	923	936	637	132	211	165
Link Distance (ft)			768	768	830	830		304	304	304
Upstream Blk Time (%)			0	0	5	6			0	0
Queuing Penalty (veh)			1	1	41	50			0	0
Storage Bay Dist (ft)	350	350					400			
Storage Blk Time (%)	2	10	0			48				
Queuing Penalty (veh)	12	58	0			85				

Intersection: 3: Valley St & St. John St/Danforth

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	526	175	419	317	178	299	162	126
Average Queue (ft)	244	157	236	48	83	136	51	48
95th Queue (ft)	567	207	381	180	155	278	125	109
Link Distance (ft)	562		480		304	304	480	
Upstream Blk Time (%)	6		1			0		
Queuing Penalty (veh)	0		0			1		
Storage Bay Dist (ft)		100		300				100
Storage Blk Time (%)	1	45	6				11	1
Queuing Penalty (veh)	7	2	7				6	1

Intersection: 4: Cassidy Point & W. Commercial

Movement	EB	EB	WB	WB	B21	NE	NE
Directions Served	T	TR	LT	T	T	L	R
Maximum Queue (ft)	275	316	206	258	161	42	9
Average Queue (ft)	60	111	89	116	47	9	1
95th Queue (ft)	203	284	260	321	247	28	7
Link Distance (ft)	830	830		308	385	548	548
Upstream Blk Time (%)			1	4	0		
Queuing Penalty (veh)			0	62	6		
Storage Bay Dist (ft)			250				
Storage Blk Time (%)			4	8			
Queuing Penalty (veh)			34	59			

Intersection: 5: Ferry Terminal/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	TR	LT	R	R
Maximum Queue (ft)	1002	764	22	1121	50	61	231
Average Queue (ft)	690	214	1	1060	7	4	108
95th Queue (ft)	1103	845	9	1312	31	26	196
Link Distance (ft)	1239	1239		1078	321	321	442
Upstream Blk Time (%)	0	2		44			
Queuing Penalty (veh)	0	10		0			
Storage Bay Dist (ft)			75				
Storage Blk Time (%)				36			
Queuing Penalty (veh)				1			

Intersection: 15: W. Commercial & Sec, Ent.

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	40	71	4	33	79
Average Queue (ft)	9	24	0	10	30
95th Queue (ft)	32	161	3	32	60
Link Distance (ft)	341	341	1239	465	465
Upstream Blk Time (%)		1			
Queuing Penalty (veh)		7			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: W. Commercial & Employee Lot

Movement	EB	EB	B21	B21	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	116	377	118	192	180	50	108
Average Queue (ft)	24	47	9	22	28	13	38
95th Queue (ft)	131	273	83	124	179	39	84
Link Distance (ft)	385	385	308	308	792	515	515
Upstream Blk Time (%)	0	2	0	0			
Queuing Penalty (veh)	1	13	0	1			
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 19: W. Commercial & Main Ent.

Movement	EB	EB	SB	SB
Directions Served	L	T	L	R
Maximum Queue (ft)	48	161	38	77
Average Queue (ft)	11	42	10	32
95th Queue (ft)	37	318	33	64
Link Distance (ft)	792	792	491	491
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		1		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 601

Summary of All Intervals

Run Number	10	11	12	8	9	Avg
Start Time	4:57	4:57	4:57	4:57	4:57	4:57
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	4729	4740	4688	4809	4675	4726
Vehs Exited	4482	4578	4473	4587	4429	4510
Starting Vehs	219	225	209	220	223	221
Ending Vehs	466	387	424	442	469	433
Travel Distance (mi)	4624	4679	4625	4744	4564	4647
Travel Time (hr)	449.3	459.7	466.3	473.1	476.0	464.9
Total Delay (hr)	285.6	293.5	302.8	304.9	314.1	300.2
Total Stops	11915	10242	11438	10578	12727	11374
Fuel Used (gal)	218.3	223.8	221.9	227.8	223.2	223.0

Interval #0 Information Seeding

Start Time	4:57
End Time	5:00
Total Time (min)	3
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	10	11	12	8	9	Avg
Vehs Entered	4729	4740	4688	4809	4675	4726
Vehs Exited	4482	4578	4473	4587	4429	4510
Starting Vehs	219	225	209	220	223	221
Ending Vehs	466	387	424	442	469	433
Travel Distance (mi)	4624	4679	4625	4744	4564	4647
Travel Time (hr)	449.3	459.7	466.3	473.1	476.0	464.9
Total Delay (hr)	285.6	293.5	302.8	304.9	314.1	300.2
Total Stops	11915	10242	11438	10578	12727	11374
Fuel Used (gal)	218.3	223.8	221.9	227.8	223.2	223.0

1: VMB & Fore River Pkwy Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.6	0.0	0.2	0.3
Total Del/Veh (s)	15.9	21.1	61.3	24.1

2: Fore River Pkwy/W. Commercial & Valley St Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	31.2	110.8	15.6	53.1

3: Valley St & St. John St/Danforth Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	4.1	1.3	0.1	2.9	1.6
Total Del/Veh (s)	44.9	38.6	14.4	48.4	31.4

4: Cassidy Point & W. Commercial Performance by approach

Approach	EB	WB	NE	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	8.1	17.0	19.3	12.4

5: Ferry Terminal/Beach St & W. Commercial Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	290.1	0.1	0.3	137.5
Total Del/Veh (s)	76.3	90.0	133.0	53.3	80.7

15: W. Commercial & Sec. Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	3.1	5.4	25.6	4.7

17: W. Commercial & Employee Lot Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	4.6	7.8	56.6	7.3

19: W. Commercial & Main Ent. Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	4.3	2.1	33.9	4.1

Total Network Performance

Denied Del/Veh (s)	78.8
Total Del/Veh (s)	139.3

Intersection: 1: VMB & Fore River Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	165	348	326	374	386	363	332
Average Queue (ft)	109	193	158	252	268	213	184
95th Queue (ft)	184	316	278	347	363	446	416
Link Distance (ft)		1434	1434	768	768	1249	1249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90						
Storage Blk Time (%)	14	22					
Queuing Penalty (veh)	100	31					

Intersection: 2: Fore River Pkwy/W. Commercial & Valley St

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	378	408	538	463	846	851	475	160	252	256
Average Queue (ft)	231	299	270	235	629	643	330	80	129	76
95th Queue (ft)	440	464	740	624	978	984	658	145	216	166
Link Distance (ft)			768	768	830	830		304	304	304
Upstream Blk Time (%)			4	0	11	13			0	0
Queuing Penalty (veh)			33	4	83	99			0	0
Storage Bay Dist (ft)	350	350					400			
Storage Blk Time (%)	4	23	0			55				
Queuing Penalty (veh)	24	143	1			97				

Intersection: 3: Valley St & St. John St/Danforth

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	535	175	430	203	220	298	144	148
Average Queue (ft)	238	156	238	51	80	132	45	51
95th Queue (ft)	538	210	401	198	168	274	120	113
Link Distance (ft)	562		480		304	304	480	
Upstream Blk Time (%)	3		0			0		
Queuing Penalty (veh)	0		0			2		
Storage Bay Dist (ft)		100		300				100
Storage Blk Time (%)	2	43	6				9	0
Queuing Penalty (veh)	7	2	7				5	0

Intersection: 4: Cassidy Point & W. Commercial

Movement	EB	EB	WB	WB	B21	NE	NE
Directions Served	T	TR	LT	T	T	L	R
Maximum Queue (ft)	348	403	256	308	238	49	14
Average Queue (ft)	65	121	131	163	69	11	1
95th Queue (ft)	218	312	323	394	296	33	9
Link Distance (ft)	830	830		308	385	548	548
Upstream Blk Time (%)			1	7	1		
Queuing Penalty (veh)			0	112	9		
Storage Bay Dist (ft)			250				
Storage Blk Time (%)			7	13			
Queuing Penalty (veh)			57	103			

Intersection: 5: Ferry Terminal/Beach St & W. Commercial

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	TR	LT	R	R
Maximum Queue (ft)	1212	1258	22	1127	48	40	232
Average Queue (ft)	785	295	1	1048	7	4	123
95th Queue (ft)	1274	1035	8	1316	34	23	215
Link Distance (ft)	1239	1239		1078	321	321	442
Upstream Blk Time (%)	0	2		42			
Queuing Penalty (veh)	2	12		0			
Storage Bay Dist (ft)			75				
Storage Blk Time (%)				36			
Queuing Penalty (veh)				1			

Intersection: 15: W. Commercial & Sec, Ent.

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	63	302	42	46	73
Average Queue (ft)	16	29	2	11	31
95th Queue (ft)	49	175	27	34	64
Link Distance (ft)	341	341	1239	465	465
Upstream Blk Time (%)		1			
Queuing Penalty (veh)		6			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: W. Commercial & Employee Lot

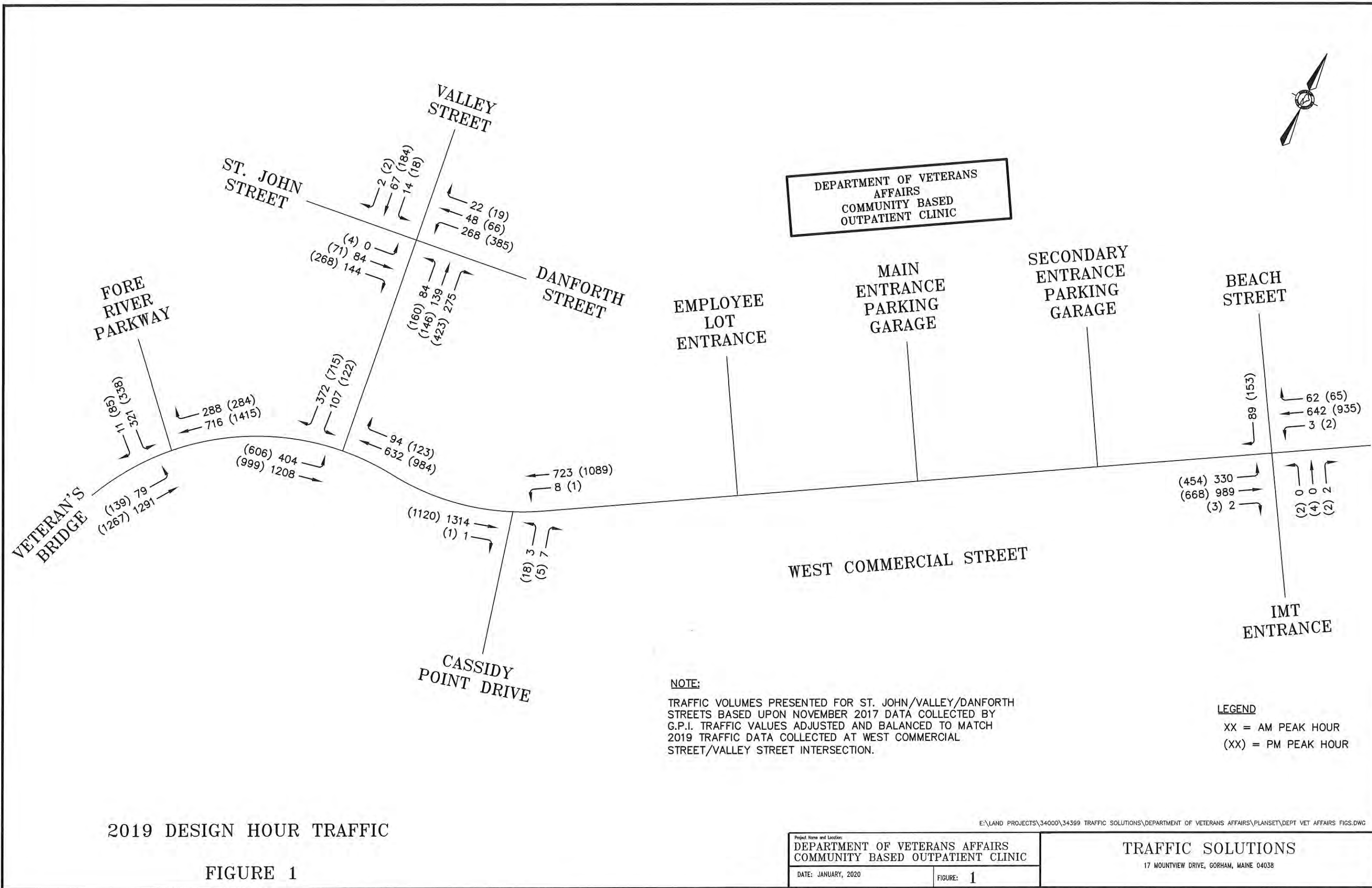
Movement	EB	EB	B21	B21	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	144	457	155	253	432	37	131
Average Queue (ft)	34	43	9	21	69	11	46
95th Queue (ft)	113	257	78	124	385	35	110
Link Distance (ft)	385	385	308	308	792	515	515
Upstream Blk Time (%)	0	0		0	0		
Queuing Penalty (veh)	0	2		0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

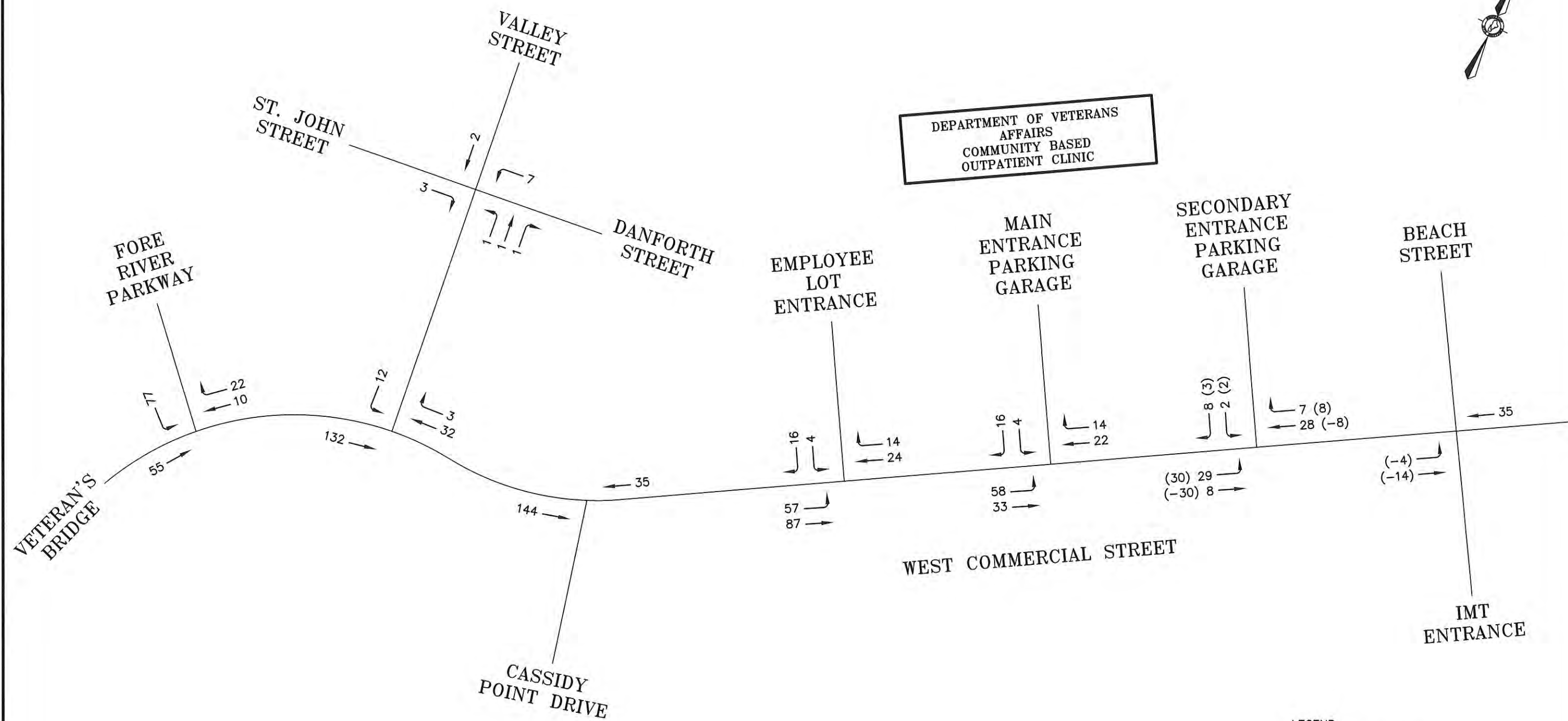
Intersection: 19: W. Commercial & Main Ent.

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	86	374	106	55	106
Average Queue (ft)	29	24	7	14	39
95th Queue (ft)	70	216	64	42	82
Link Distance (ft)	792	792	341	491	491
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		1			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 944





LEGEND

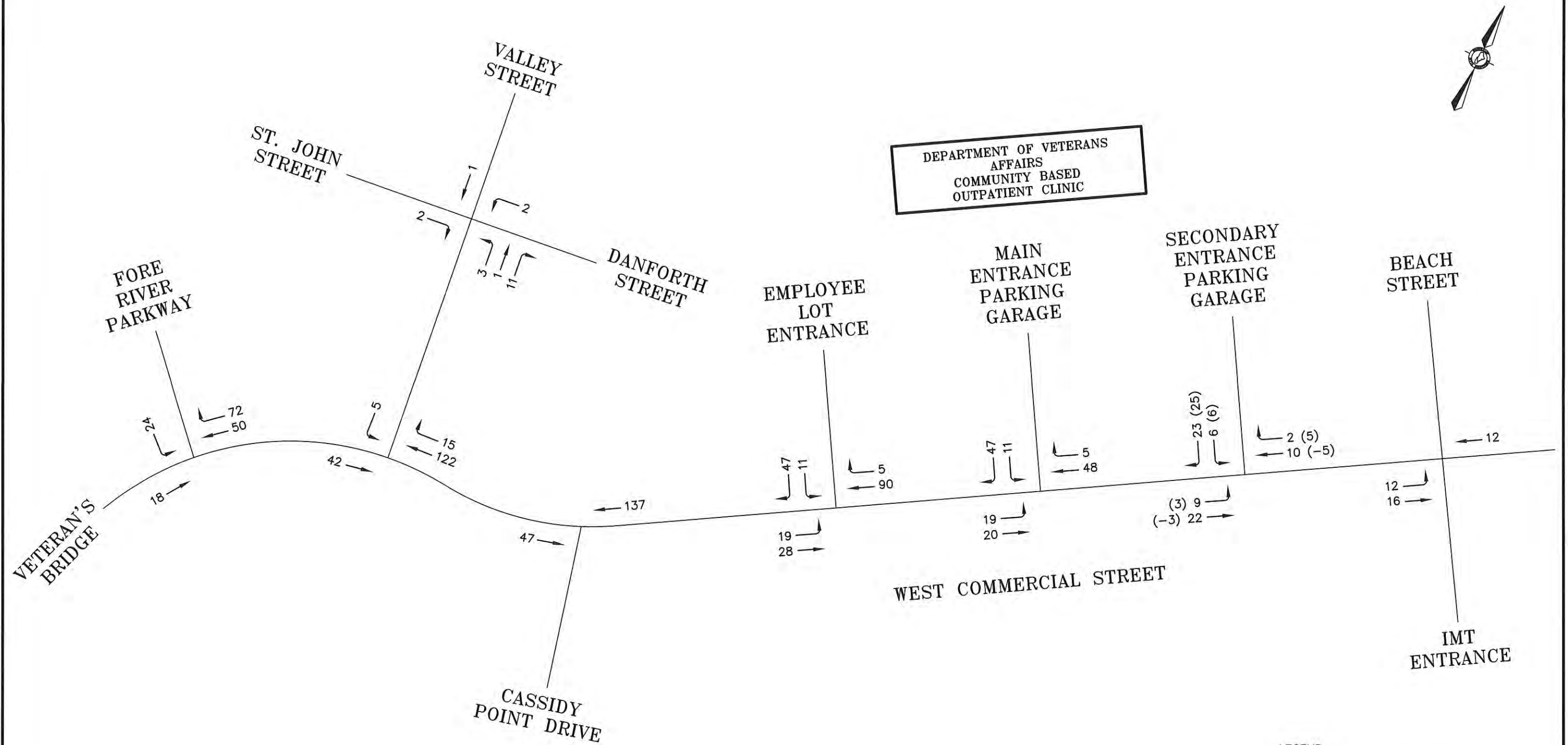
XX = VA CLINIC SITE TRIPS
(XX) = EXTRA GARAGE SPACES - TRIPS

SITE TRAFFIC ASSIGNMENT
AM PEAK HOUR (STREET)
FIGURE 2A

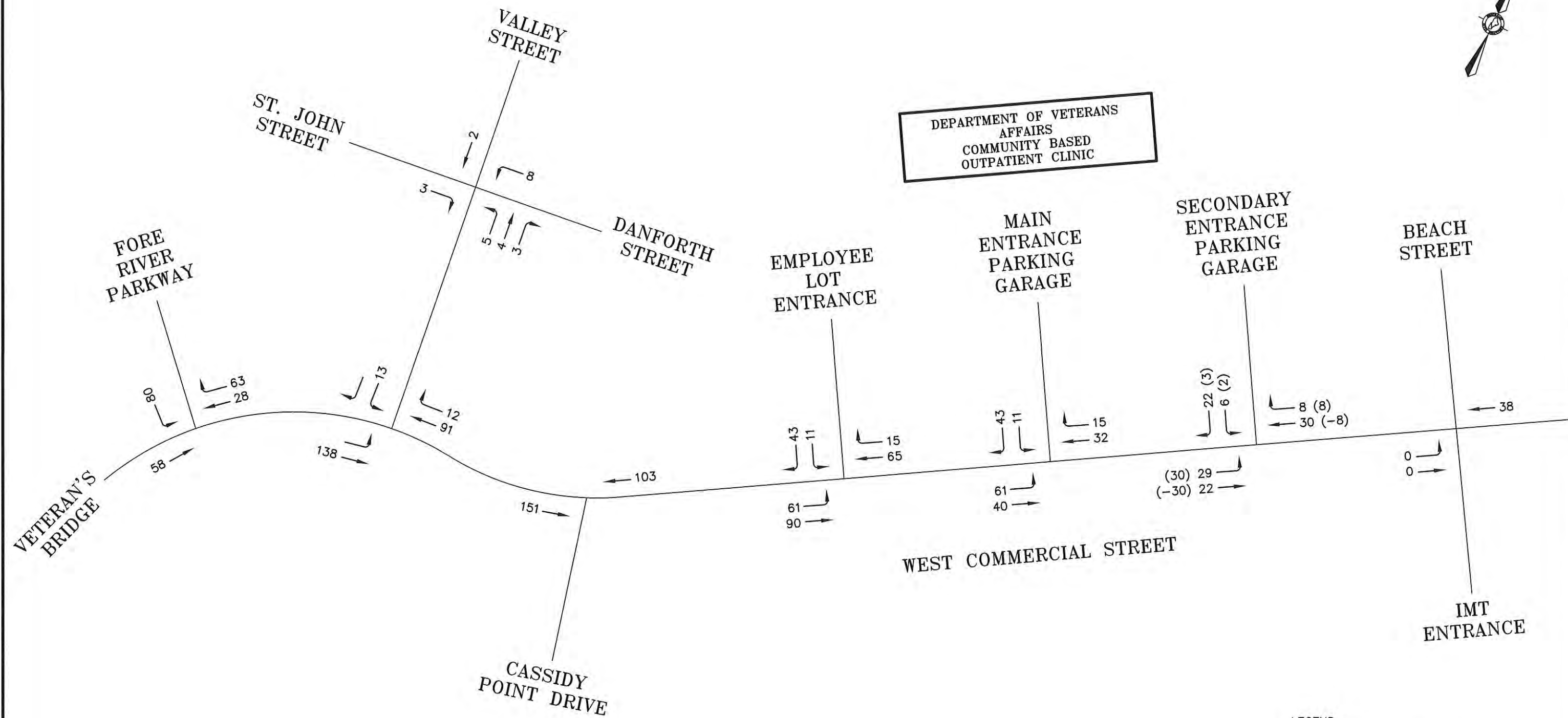
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Project Name and Location: DEPARTMENT OF VETERANS AFFAIRS COMMUNITY BASED OUTPATIENT CLINIC	
DATE: JANUARY, 2020	FIGURE: 2A

TRAFFIC SOLUTIONS
17 MOUNTVIEW DRIVE, GORHAM, MAINE 04038

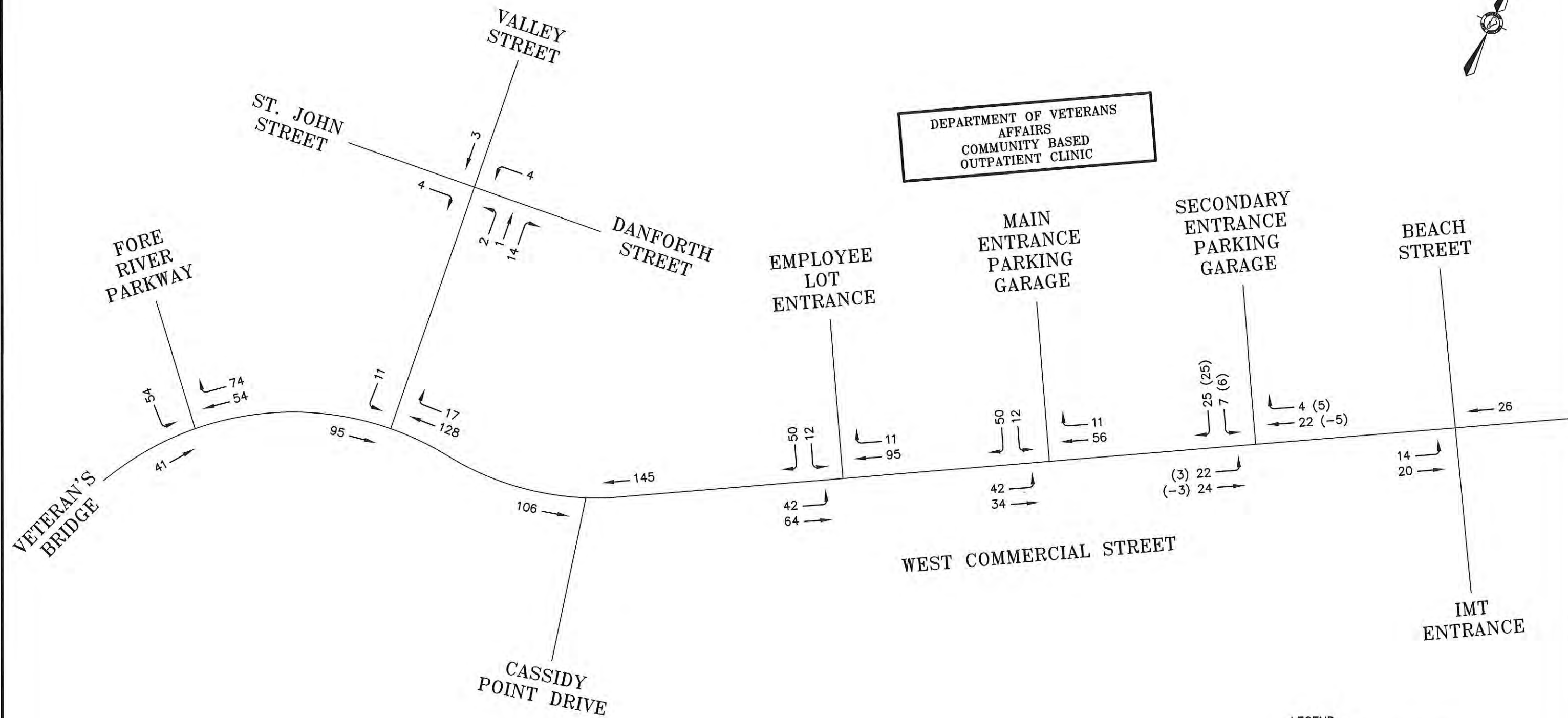


SITE TRAFFIC ASSIGNMENT
PM PEAK HOUR (STREET)
FIGURE 2B



LEGEND
 XX = VA CLINIC SITE TRIPS
 (XX) = EXTRA GARAGE SPACES - TRIPS

**SITE TRAFFIC ASSIGNMENT
AM PEAK HOUR (GENERATOR)
FIGURE 2C**



LEGEND

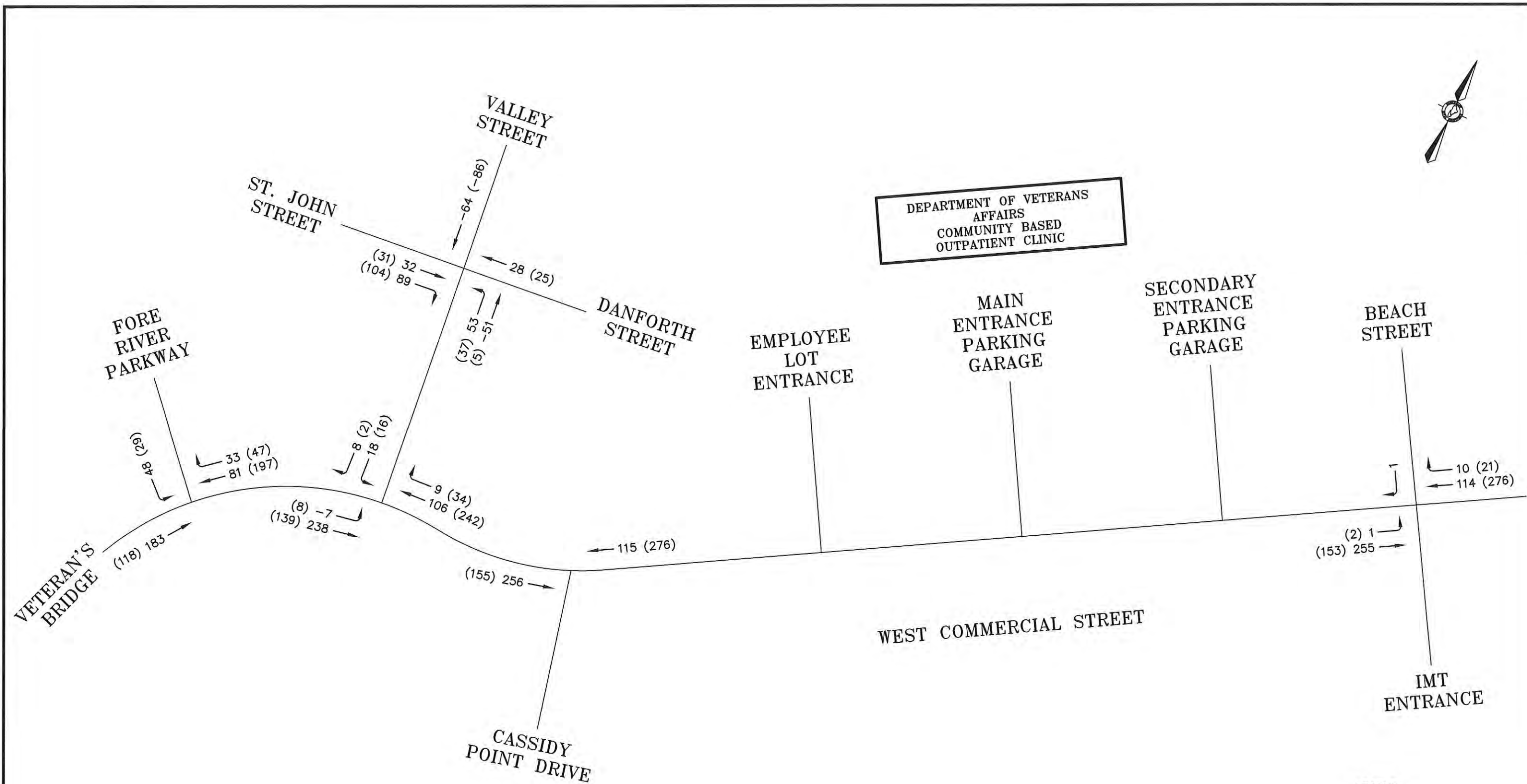
- XX = VA CLINIC SITE TRIPS
- (XX) = EXTRA GARAGE SPACES - TRIPS

SITE TRAFFIC ASSIGNMENT
PM PEAK HOUR (GENERATOR)
FIGURE 2D

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Project Name and Location: DEPARTMENT OF VETERANS AFFAIRS COMMUNITY BASED OUTPATIENT CLINIC	
DATE: JANUARY, 2020	FIGURE: 2D

TRAFFIC SOLUTIONS
17 MOUNTVIEW DRIVE, GORHAM, MAINE 04038



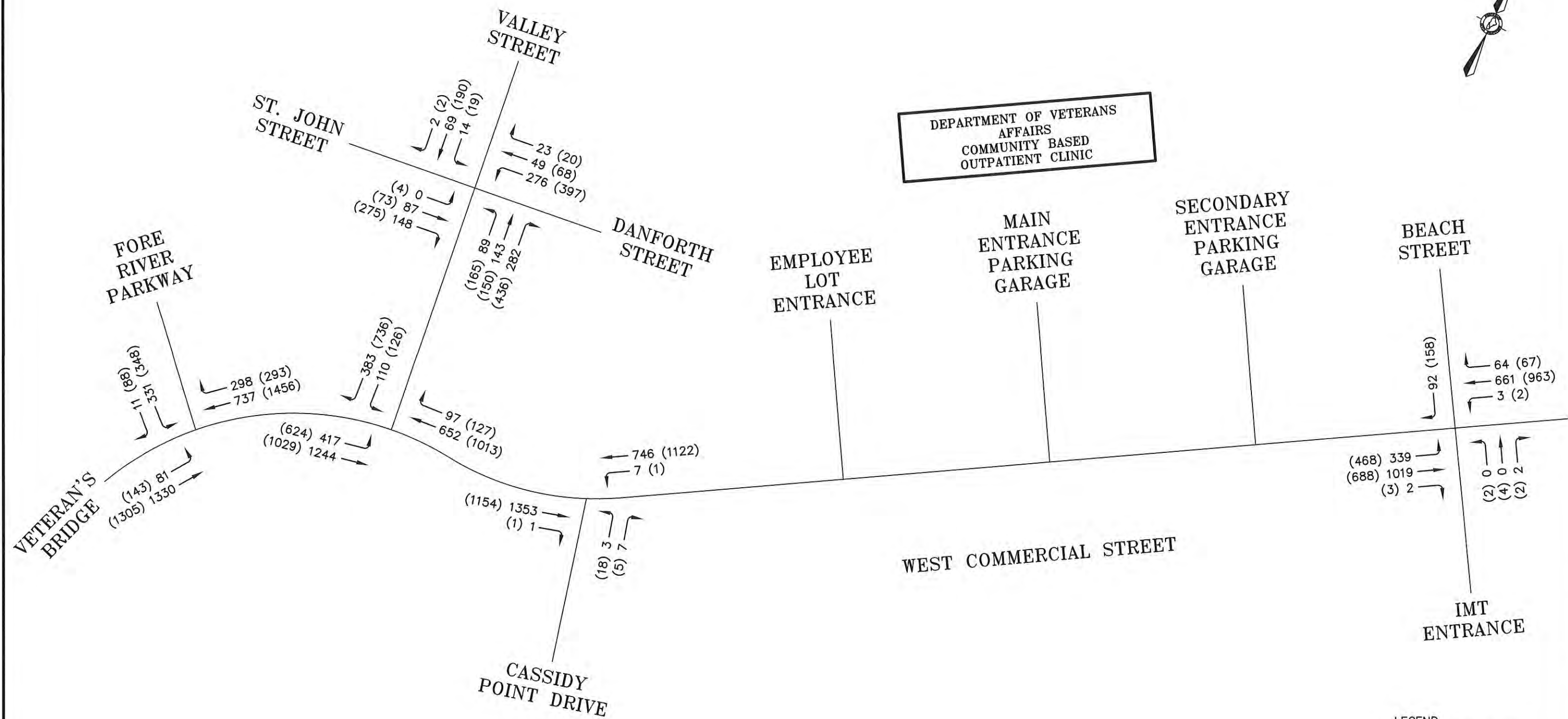
LEGEND
 XX = AM PEAK HOUR
 (XX) = PM PEAK HOUR

OTHER DEVELOPMENT TRAFFIC

FIGURE 3

Project Name and Location: DEPARTMENT OF VETERANS AFFAIRS COMMUNITY BASED OUTPATIENT CLINIC		TRAFFIC SOLUTIONS 17 MOUNTVIEW DRIVE, GORHAM, MAINE 04038
DATE: JANUARY, 2020	FIGURE: 3	

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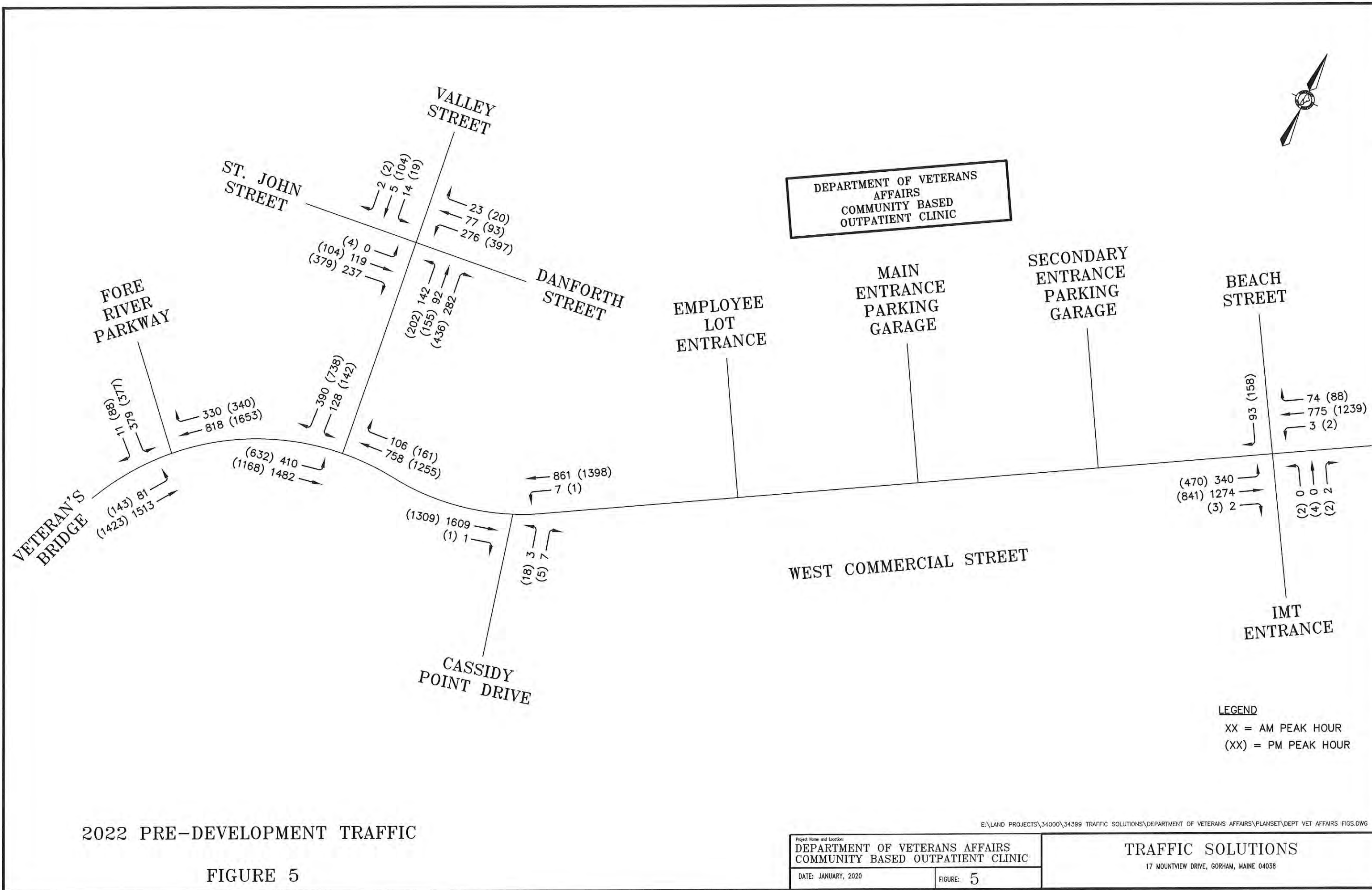
LEGEND
 XX = AM PEAK HOUR
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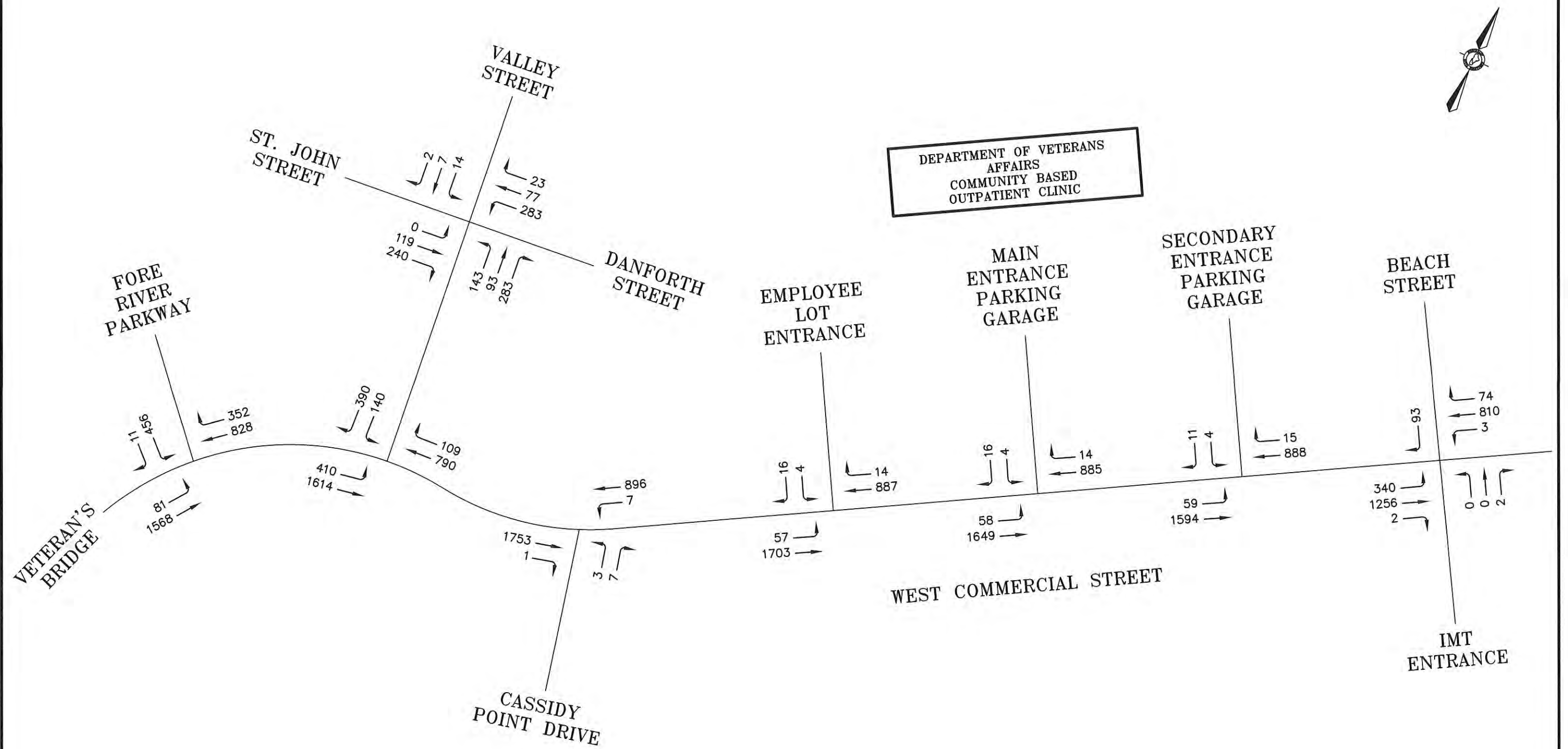
2022 DESIGN HOUR TRAFFIC

FIGURE 4

Project Name and Location: DEPARTMENT OF VETERANS AFFAIRS COMMUNITY BASED OUTPATIENT CLINIC		TRAFFIC SOLUTIONS	
DATE: JANUARY, 2020	FIGURE: 4	17 MOUNTVIEW DRIVE, GORHAM, MAINE 04038	

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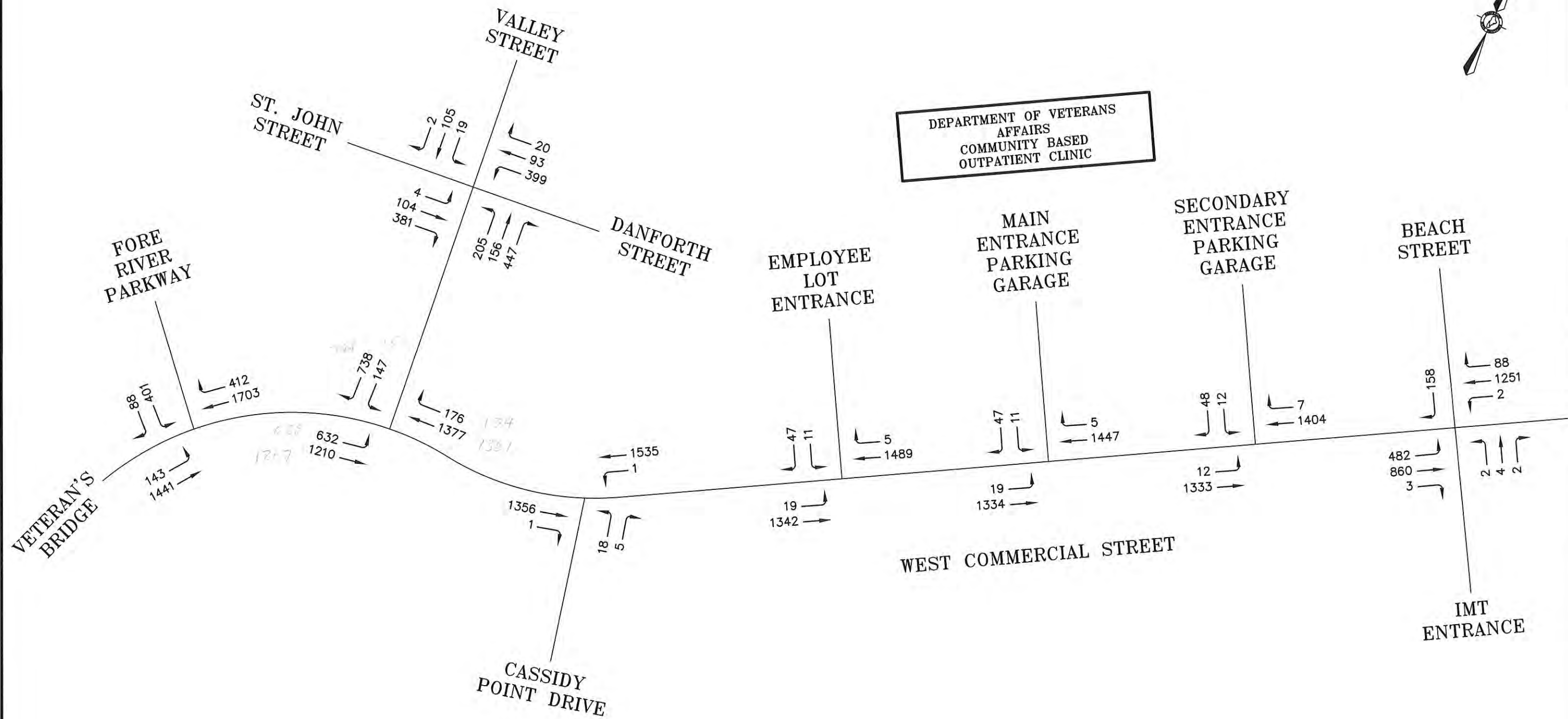




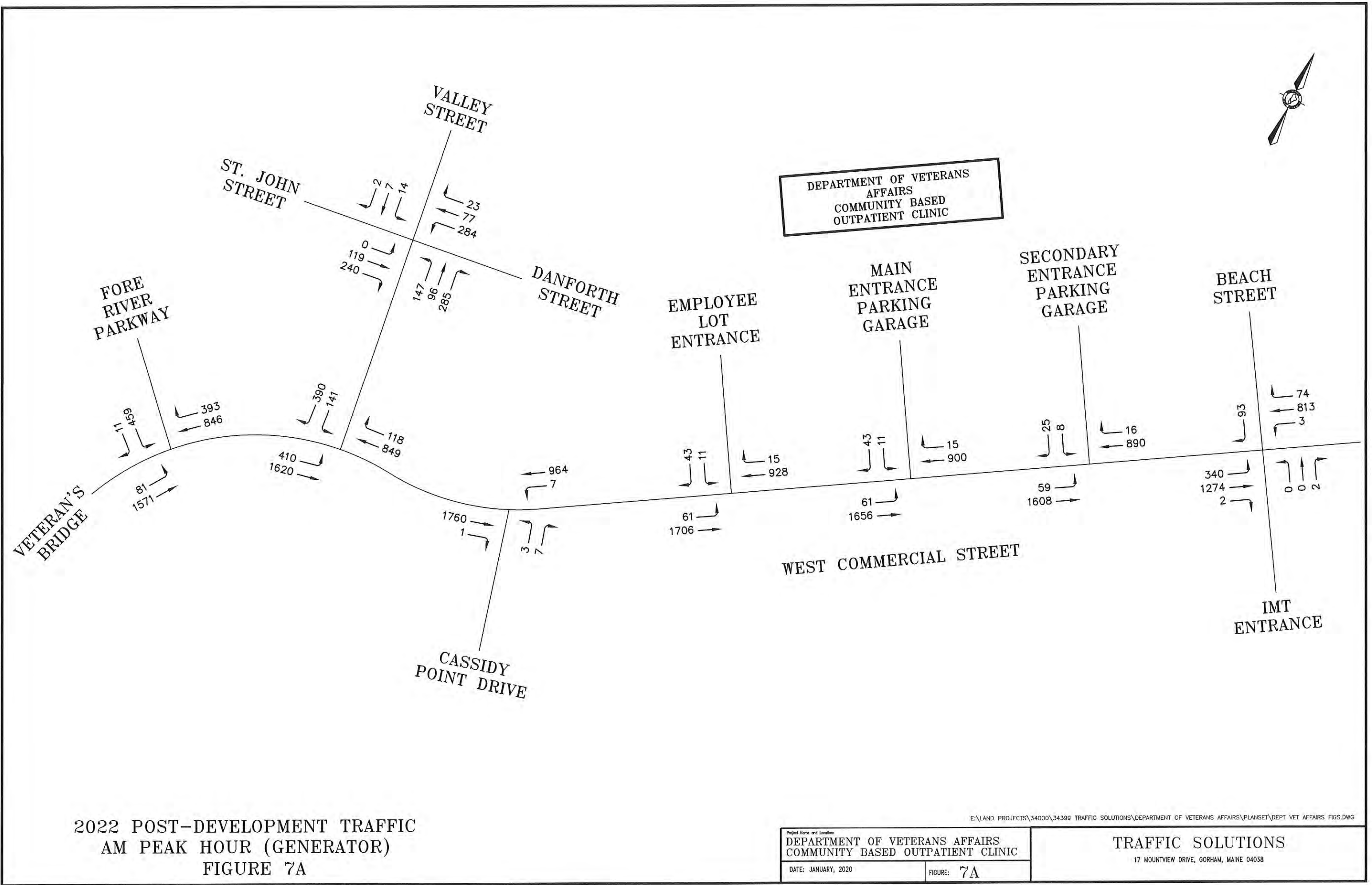
2022 POST-DEVELOPMENT TRAFFIC
AM PEAK HOUR (STREET)
FIGURE 6A

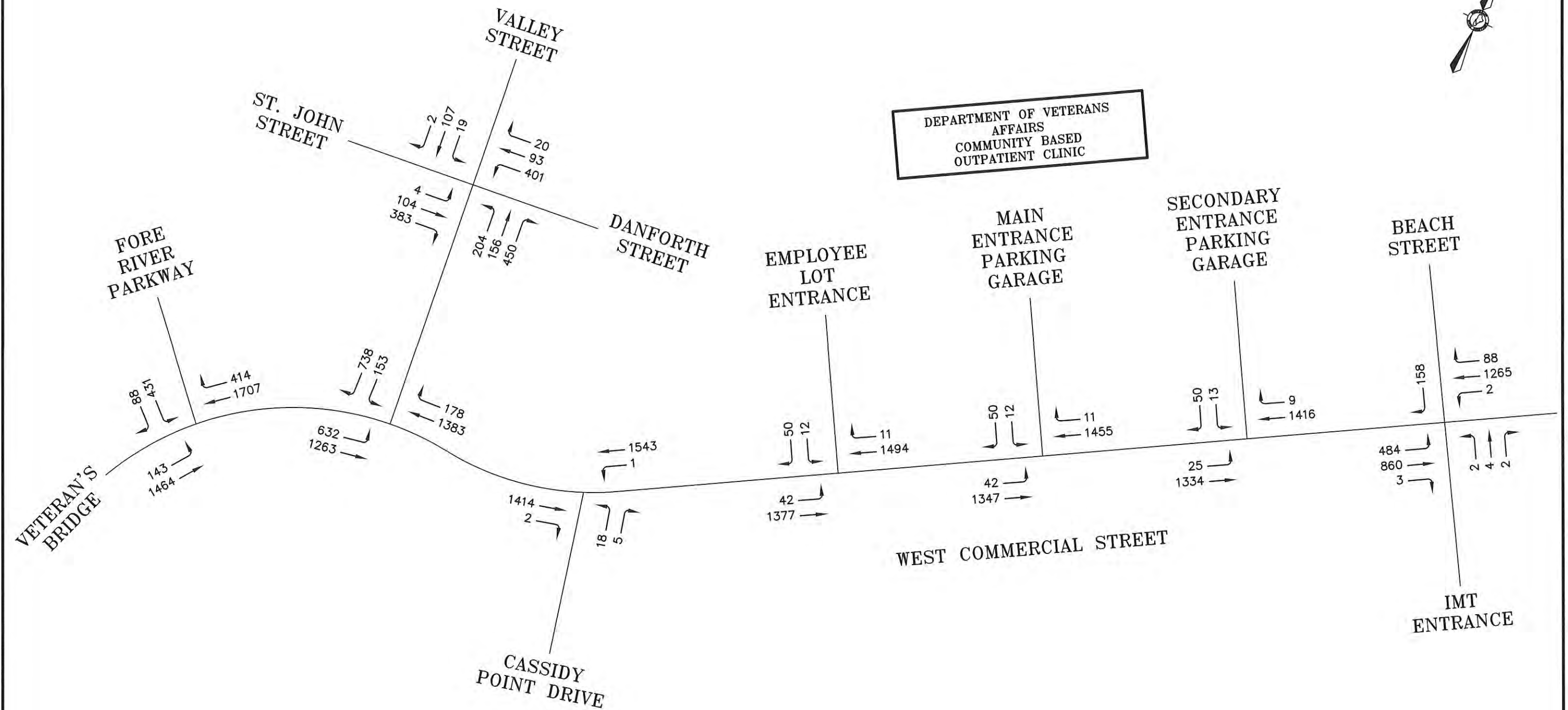
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Project Name and Location: DEPARTMENT OF VETERANS AFFAIRS COMMUNITY BASED OUTPATIENT CLINIC		TRAFFIC SOLUTIONS 17 MOUNTVIEW DRIVE, GORHAM, MAINE 04038
DATE: JANUARY, 2020	FIGURE: 6A	



2022 POST-DEVELOPMENT TRAFFIC
PM PEAK HOUR (STREET)
FIGURE 6B





2022 POST-DEVELOPMENT TRAFFIC
PM PEAK HOUR (GENERATOR)
FIGURE 7B

PUBLIC INFRASTRUCTURE AND SAFETY

The following statements are provided in accordance with the submission and Section 14-526 of the ordinance.

(c) Public Infrastructure and Community Safety Standards.

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*

1. Consistency with City Master Plans:

- a. The project has been designed to be consistent with the B-5b Zoning and offsite infrastructure plans. The site is uniquely placed along the West Commercial Street corridor and its location in the City along a gateway corridor is considered ideal to visually communicate the VA's brand to the local public and veterans alike, and also while establishing the VA as recognized identity in the Portland Community. The implementation of the West Commercial Street multi-modal pathway into the site planning meets the objectives of previous City Studies and planning.
- b. The development will maintain various infrastructure, including utilities within West Commercial Street corridor and the Emery Street paper right of way. The existing CSO overflow control chamber in the west end of the site will remain unchanged and not impacted by the development.

Public Safety and Fire Prevention (14-526 (c) 2)

- *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*

2. Public Safety and Fire Prevention:

- a. The site has been designed to promote a safe and welcoming environment. The VA will maintain security on the campus including building entry controls, restricted parking areas, and camera surveillance.
- b. The site provides access from three driveways for emergency vehicles.
- c. Fire hydrants are located along West Commercial Street and will be within 25' of the front corner of the garage. The clinic will be fully sprinklered and the parking garage will contain standpipes for Fire Department use. A summary letter to Division Chief Thompson is included at the end of this section.

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*

- a. The Applicant is securing letters from the applicable utilities stating their ability to serve the site. The project will require new electrical, gas, sewer, and water services to the clinic and power and sewer to the garage.
- b. All new electrical services to the site will be underground.
- c. All new utility infrastructure will meet the provisions of the Technical Manual. The Clinic will be served by new fire and domestic mains off the PWD 16" water main located in West Commercial Street. The building sewer will connect to the existing Fore River Interceptor sewer located along the front property line. Power will be from the existing overhead primary distribution system that CMP maintains on West Commercial Street.
- d. The project will utilize a new service connections to the public sewer system within the Fore River Interceptor located along the site's front property line.
- e. All new sewer and stormwater infrastructure will meet City standards. Backflow prevention in accordance with PWD standards will be provided in the buildings.
- f. A solid waste collection and storage area will be provided with adequate capacity for the needs of the development. The VA will maintain their solid waste collection equipment at the rear of the clinic where it will be screened from view.

Ability to serve letters will be forwarded to the planning office upon receipt.

DEPARTMENT OF VETERAN AFFAIRS

ARCHITECTURAL NARRATIVE

SMITHGROUP

November 15, 2019

ARCHITECTURAL NARRATIVE



ARCHITECTURAL NARRATIVE

Architectural Design Objective

SmithGroup is a nationally recognized leader in advocating the importance of architectural and interior design in the healing process. Implementing patient-centered design concepts has allowed the design team to be truly focused on the environmental needs of patients, while recognizing the importance of comfort and satisfaction for visitors and caregivers. To ensure the full understanding of the unique culture of each healthcare facility, the SmithGroup team conducts meetings with Clients, Patient advocates, and Stakeholders to address the most appropriate patient-centered and facility-directed design concepts that will improve patient outcomes and satisfaction.

SmithGroup also places a high value on stewardship of the environment through sustainable design. Our

Healthcare projects emphasize the relationship to the environment and appropriate design responses for the climate. In addition, SmithGroup emphasizes the physical wellness of the patient, visitor, and caregiver. SmithGroup's projects include innovative patient and family amenities such as resource libraries, serenity or meditation rooms, natural light with exterior views, direct access to the outdoors, and custom regionally-inspired art.

The FD Stonewater, Landry/French Construction, and SmithGroup team for the Portland, Maine Community-Based Outpatient Clinic will emphasize the integration of these elements throughout the process to create a facility showcasing innovative design ideas within a framework of optimizing the healing environment for the body, mind, and spirit of our veterans. The site has abundant water views and is outside of the FEMA 100-year floodplain.

Location

Our proposed site for the CBOC is located on West Commercial Street in Portland, Maine within the Area of Consideration as shown in the RLP. The site is 10.66 acres in size and is unencumbered by existing structures for preservation, reuse or demolition. The developable portion of the site has approximately 8.3 acres of land and 1,500 linear feet of street frontage on West Commercial. Approximately four acres of the developable site is zoned B-5b, Commercial, which is where the CBOC would be located. The other 4 acres (on the uphill slope) is zoned R-4, Residential. Medical Clinic is a permitted use in the commercial zone and this makes the CBOC a use-by-right without need to seek special permitting on our site.

The proposed CBOC site is near I-295 and I-95 (Maine Turnpike) providing convenient access from the north and south and Route 77 providing access from Cape Elizabeth and points west. The site is also approximately one-half of a mile from the western edge of Portland's historic downtown and central business district. Maine Medical Center, a 637-bed teaching hospital, is less than one-mile away to the north of the CBOC site. A Portland Fire Department station is located 2.7 miles away from the Clinic at 684 Broadway. The topography of the site includes a relatively level area (coinciding with the commercial zone) and a steeper area which is part of the residential zone. The site provides views south to the Fore River

and South Portland. West Commercial Street is a main entrance route to Portland and Cape Elizabeth and the CBOC's location and orientation will serve as a gateway to patients and travelers. As a result, the CBOC will visually communicate the VA's brand to the local public, establishing the VA as a recognized identity in the Portland community.

Features:

- Site is within the RLP's Area of Consideration
- Zoned for Medical Clinic use
- Conveniently accessed by major highways and downtown Portland
- Prominent site for VA branding

Site Design

Clarity of site circulation is paramount for the success of the building, mitigating visitor anxiety at arrival and departure. The main public entrance to the CBOC is located on West Commercial Street. The entrance is made prominent by elevated architectural masses on corresponding corners of the Clinic and parking structure. A canopy is provided at the CBOC's entrance with space for three cars to drop-off and pickup. A 10-seat gathering plaza is located adjacent to the entrance to allow family and patients a chance to spend time outside the CBOC in good weather. The entrance to the patient garage is immediately to the east, directly



Proposed Site

The Gateway Rendering



off the entrance drive. The garage pedestrian entrance is across from the CBOC's main entrance with a well-marked, raised cross walk between them.

Staff parking is located on the west side of the Center and contains 150 spaces with its own entrance from West Commercial Street. A Staff building entrance is located adjacent to the staff parking. Both the main and staff entrances are separated from drive lanes by site bollards. Service vehicles enter at the east end of the site (behind the garage) and are restricted to the drive lane behind the garage and CBOC. The ambulance dock, mobile imaging station, dumpsters and loading dock are located behind the Clinic, out of site from patients and visitors. The CBOC and garage are located close to the street to limit the need for cutting into the steep hill behind and control site costs. Service vehicles will exit the site onto West Commercial at the west end of the staff parking. Patient and service traffic are designed to avoid crossing each other on the site. To avoid extensive and intrusive cutting into the hill at the back of the site, a short retaining wall has been introduced at the front of the site to raise the ground floor of the development. At its highest, the site wall will stand 6'-0" tall, with a communicating site stair to aid in ease of access. The main entrance will remain ADA compliant from the street, and the staff entry will be ADA compliant from the staff parking area. Covered entries are provided at the mobile imaging

pad, ambulance entry and loading dock. The CBOC's main entrance is over 1000' from the nearest main intersection (West Commercial Street and Beach Street).

Features:

- Prominent site entrance with segregated traffic patterns
- Covered patient parking adjacent to the CBOC
- Separate staff parking and entrance
- Discreetly located building service area

Building Design

Portland, Maine, while extremely rich with history and tradition, also celebrates innovation, with a strong commitment to art and design. This modern quality building reimagines traditional material compositions with contemporary design principles, balancing notions of permanence and progress. Having completed many projects with the VA, SmithGroup understands the mission of the VA's Patient Aligned Care Team principles. Not only must the care be patient-centered, but the design of the facility must be patient-centered, as well. SmithGroup prides itself on being at the forefront of healthcare design, and Portland's CBOC will be no exception.

Concept

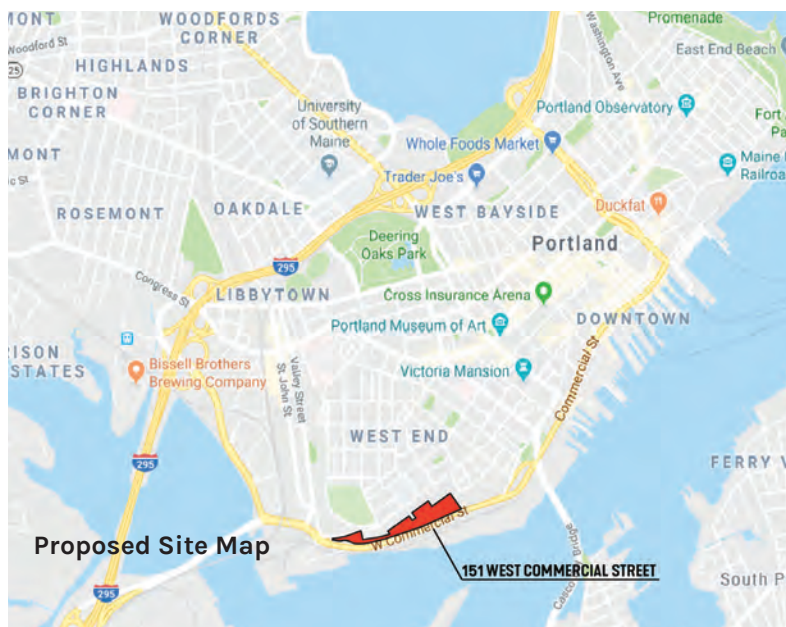
The primary concept for the buildings aims at creating a gateway through which patients and visitors enter the site, offering a clear means of access from West Commercial Street. This is achieved by raising the public lobbies and vertical circulation in the front corners of the clinic and parking structure as a welcoming beacon. We then extended activated the public-facing facades along West Commercial to take advantage of views to the Fore River and to create a positive environment for patients, family, and passerby. High glazing in the clinic is implemented to bring natural light into public zones, and to reach deep down into clinical corridors to enrich the caregiver experience.

The corners of the gateway are designed with glass, not only to offer intelligibility to the users, but also to honor our veterans through the use of patriotic supergraphics on the backdrop of each space. The building communicates appreciation for the sacrifice of our service members, as well as give them a respectful welcome at the front door. This motif is carried through the materiality of the building with a dual meaning

for each material, one which speaks to the character of those for which the building serves, and the other to reference the local vernacular. Corrugated metal represents the unwavering strength of our service members and speaks to industrial military hangars and barracks, as well as referencing Portland's waterfront industry and shipping containers. In the same spirit, a randomized color variation in the brick represents the diverse cultural backgrounds of our veterans, while also nodding to Portland's traditional New England red brick. On the rear elevation, out of public view, a more cost-effective concrete masonry unit veneer is used, with colors selected to match the brick.

Building Components

The Clinic is broken up into two major components: the frontage, which celebrates public and multi-purpose functions, and the clinical box, designed for efficient team-based care. The building design climbs two stories with rooftop mechanical units, screened with a similar corrugated metal as the street-facing façade, only perforated for proper air intake.



MATERIAL PRECEDENT

BRICK

- VA:
 - COLOR VARIATION REPRESENTS THE DIVERSE CULTURAL MAKEUP OF OUR SERVICE MEMBERS
- PORTLAND:
 - TRADITIONAL VERNACULAR

CORRUGATED METAL

- VA:
 - INDUSTRIAL MILITARY BUILDINGS; AIRPLANE, SHIP, & HUMVEE HANGARS
- PORTLAND:
 - WATERFRONT INDUSTRY & SHIPPING CONTAINERS

Waterfront View from The Gateway



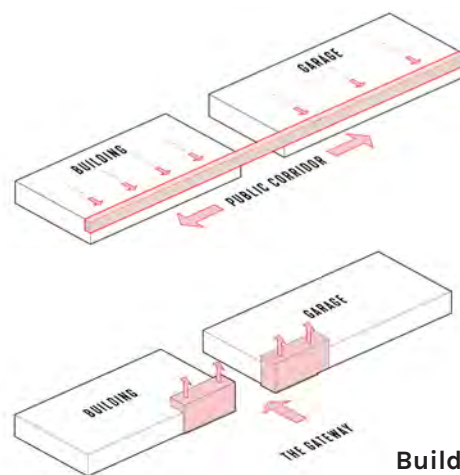
The building envelope is designed to respond to the challenges of the local climate. Walls are designed to prevent moisture penetration and minimize heat loss and gain throughout the year. Exterior steel and metals are coated or galvanized to prevent corrosion, and the building envelope will minimize air leakage to and from occupied spaces and ensure condensation control with a continuous weather barrier. The brick, composite metal panel, and corrugated metal panel systems will layer onto 3" mineral wool rigid insulation, air vapor barrier, exterior sheathing, and 8" cold-formed metal framing.

All window glazing shall be low-E, insulated glass. Storefront doors shall be low-E, insulated and tinted. Window systems shall be double glazed and provided with a continuous thermal break between inner and outer sash. Windows in the clinical areas have been appropriately sized to allow in natural light and afford privacy to patients and staff. Frames shall be thermally broken. Windows in the security exam or holding rooms will be 7/16" thick laminated glass. The laminated glass will be placed on the interior of double-glazed windows.

The roof system will be designed according to the recommendations of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual. Low slope roof systems will be designed per FM global criteria, to local environmental conditions, utilizing sloped structural system. Roofing membrane system will be a layering of black EPDM roofing, coverboard,

4" of rigid insulation, vapor barrier, on metal decking. Roof walkways will be made of prefabricated roof walk pad with nonslip surfaces, on access routes to mechanical equipment that requires recurrent maintenance. Roof ladders, stair and platforms will be provided as necessary to ensure the safety of maintenance workers.

Insulated galvanized metal doors or aluminum storefront doors will be provided, as appropriate. All doors will be a minimum of 3 feet wide in non-patient areas, and 3 feet 6 inches in patient areas. The main entrance doors will be automatic sliding doors of anodized aluminum construction with safety glazing. They will comply with the same energy efficiency requirements as the window systems.



Building Diagrams



Southfacing Exterior Night Rendering

At the main entrance, staff entrance, ambulance entrance, loading dock, and mobile imaging entrance, vestibules will provide an airlock. Other swinging exterior doors will be heavy duty, insulated, full-flush hollow steel construction. All exterior doors will be weather-stripped, self-closing, and outward opening. Latch guards and hinges with non-removable pins will deter tampering or unauthorized entry. Exterior details will be designed to preempt bird roosting. Exterior structures that will be included in the overall campus design scheme include:

- Covered vehicle drop-off area at the main building entrance
- Staff-entry canopy
- Ambulance drop-off and canopy
- Mobile imaging pad and canopy
- Covered loading dock area

All covered walkways and service overhangs will be constructed of non-combustible materials and are integrated into the architectural style of the building. Walkways will be illuminated with integrated fixtures controlled by the site lighting system. Where required by the AHJ, walkways and overhangs will be fully sprinklered.

Any service and equipment yards will be blocked from public view by screen walls that are architecturally compatible with the main building.

The facility is designed to meet Federal and Local requirements for fire safety, physical security, accessibility, seismic, and sustainability standards per the terms of the solicitation for proposals and will be fully compatible with the VA's intended use.

Features:

- Modern quality building with durable exterior materials
- Articulated building elements for pleasing aesthetics and patient way finding
- Covered and protected entrances
- Weather resistant and energy efficient envelope



Planning & Tenant Improvement

The VA space program in the Request for Lease Proposal is located on two floors in the CBOC. The program spaces have been laid-out in the test fit plans with an emphasis on efficient and understandable layouts. Specialty clinics such as dental, eye, audiology and mental health are located on the first level for ease of access, and the larger Patient Aligned Care Team (PACT) spaces are grouped on the second level, with easy access through elevators and stair. There is a grouping of one freight/stretchers elevator and one passenger elevator, located near the primary check-in and waiting spaces on the first floor. Floor plans are designed to be easily understandable, with clear cues to draw the users to key checkpoints. All corridors are 6 feet in width. Security measures, as outlined in Appendix C, will be included. Exterior windows are provided at the end of major circulation corridors for natural light and connection to the exterior. Appropriate finishes and materials will be used in patient, staff, and public spaces to conform with the TI budget and medical office building character of the building. Minimum 9'-0" high ceilings will be provided throughout with 10' ceilings in larger spaces (>500SF).

Features:

- Patient-centered design focused around team-based care
- Efficient layouts for state-of-the-art treatment
- Clear and consistent patient waiting and circulation patterns with abundant natural light
- Separation of open patient and secured staff circulation





























707 Sable Oaks Drive, Suite 30
South Portland, Maine 04106
207.772.2515

Att. O

December 4, 2019

Ms. Christine Grimando

Planning and Development Department
City of Portland, Maine
389 Congress Street
Portland, Maine 04101-3509

**Subject: Application for Level III Site Plan Application
FDS JBB Portland LLC
Proposed VA Community Based Outpatient Clinic (CBOC)
113 West Commercial Street**

Dear Christine:

On behalf of **FDS JBB Portland LLC** (Applicant), our office is pleased to provide the uploaded submission materials for a Level III Site Plan Application. This submission package is intended to meet the City's Level III Site Plan Submission requirements as outlined in the Level III Site Plan Checklist as well as Section 14-526 of the Code of Ordinances.

PROJECT OVERVIEW

The applicant is proposing to develop a 62,300± SF Veterans Administration Clinic and supporting parking garage under a long-term lease agreement with the Department of Veterans Affairs. Site construction is scheduled to begin in early 2020, pending City Site Plan approval with building permits from now through late winter. The front area of the site to be developed is currently in the B-5b Zoning District and the Waterfront TIF District. The site is identified in the City's Assessors Tax Map 060/Block A001/Lot 001. The lot area is 8.4 acres of undeveloped land, although the site did contain a rail yard many years ago.

The current development plan includes the following uses and design elements:

- A new two-story Clinic building with a footprint of approximately 34,155± SF and a total GLA of approximately 62,300 SF. The Clinic will contain on the first floor, patient care services and administration while the second floor will include specialty clinics such as dental, eye, audiology and mental health. The building will contain a single loading dock for truck deliveries as well as outside space for the parking of a mobile imaging trailer. A loading area for ambulances will also be located at the rear of the building. The building will contain a full fire suppression system along with typical utilities for water, sanitary, underground power, and natural gas. Patient/Visitor entry will be focused to the east end of the building and staff entry will be on the west end of the building. The building positioning locates the front entry tower closest to the West Commercial Street right of way line at less than 10', which is consistent with the B-5b dimensional requirements. The proposed building is expected to provide a prominent base as a gateway into the City as well as communicating the VA's brand to the local public and visitors to the city alike. At a two-story height (max at 43'-0"), the building will also fall well within the scale of nearby structures and it will result in insignificant visual impact to the residential neighborhoods to the north (off Danforth Street) that are substantially higher in elevation than the development site.



- A 382-space precast parking garage will be positioned on the east end of the property. Similar to the Clinic building, the garage elevator tower will anchor the building to the street front, as it too, is positioned within the maximum 10' setback from the right of way. The garage will contain 250 dedicated spaces to VA Clinic patients/visitors and 132 spaces for open parking available to the nearby Star Match Building, also owned by J.B. Brown & Sons. The owner will be discussing opportunities with City officials for the use of the garage as a storm event overflow parking facility and related use. Initially, parking in the garage will be reserved specifically for VA use (lower two floors) while the surplus parking on the upper deck will be for ancillary and J.B. Brown use. The owner reserves the right to install gate controls for portions or all of the garage in the future to allow for greater public use (either short term "pay for" parking or long-term business parking leases).
- The main project driveway entrance will be located between the two buildings, thus allowing for patient drop off/pick up and garage parking access from the same driveway. The main driveway will contain a single entering lane and two exiting lanes. Secondary driveways will be provided at the west end of the site for access to the Staff parking lot and on the easterly end of the site for access to the parking garage and for service access around the rear perimeter of the site. All driveways are located to provide separation from the existing driveways on the opposite side of West Commercial Street that serve the Canal Landing site. Currently it is believed that the driveways will not require signalization, however improvements to West Commercial Street to provide left turn lanes into each driveway are likely to be required. A traffic impact study is being completed and the project will require a Traffic Movement Permit thru the City under your delegated authority.
- A 10' wide paved pathway is proposed along the site frontage, which is consistent with the City's West Commercial Street Multi-Modal Plan. The pathway will provide connectivity to improvements the City is pursuing both east and west of the site for providing pathway linkage between existing trail systems along the waterfront. The project is located within the Waterfront TIF District and it is understood that TIF funds will be used to support the pathway development. The pathway construction will require improvements to existing utilities including the CMP power pole locations and the existing Fore River Interceptor Sewer appurtenances that are located along the pathway alignment. A retaining wall will also be required along the back side of the pathway, to overcome the topography along the street frontage.
- Accessory uses, including but not limited to, the surface parking facilities, utility services, stormwater management systems, and site amenities are also part of the current proposal. A new staff parking lot containing 150 parking spaces will be provided on the west end of the site. The site design will employ the use of porous pavement in the surface parking lot to address both flood control and water quality treatment compliance.

CLOSURE

As outlined in the Level III Site Plan submission requirements and checklist, we will upload the following materials upon authorization by City staff:

- General Application Documents
 - o Project Description
 - o Level III Application Checklist
 - o Right, Title and Interest
 - o Zoning Assessment
 - o Existing and/or Proposed Easements
 - o Waiver Request and Waiver Table



- o Financial Capacity
 - o Technical Capability
- Transportation
 - o Transportation Narrative
 - o Traffic Assessment – (under separate cover and part of the Scoping meeting materials by Traffic Solutions)
- Environmental and Landscape Features
 - o Narrative to Address Standards
- Environmental and Stormwater
 - o Narrative to Address Standards
- Public Infrastructure and Safety
 - o Narrative to Address Standards
- Site Design
 - o Narrative to Address Standards
- Construction Management Plan – by Landry French Construction
- Site Plans and Architectural Plans

On behalf of **FDS JBB Portland LLC**, we look forward to your continued assistance on the project and we look forward to the next available workshop meeting with the Planning Board. As is required, once we complete the Planning Board workshop, the applicant will be conducting a Neighborhood Meeting. We anticipate this meeting will be conducted prior to the Public Hearing.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

GORRILL-PALMER

Stephen Bushey, PE

Senior Associate

Phone: 207-772-2515 x286

sbushey@gorrillpalmer.com

Attachments

- c: FDS – Claiborne Williams
JBB – Vin Veroneau
SmithGroup – Greg Heppner
Landry French – Mason Rowell

CONSTRUCTION MANAGEMENT PLAN

A Construction Management Plan has been prepared by Landry French Construction and is appended to this section.

**Construction Management Plan
For 133 West Commercial Street
Landry/French Construction**

This document and its subsequent attachments comprise the Construction Management Plan being submitted to the City of Portland for the new Veteran's Affairs Community Based Outpatient Clinic (CBOC) and associated Parking Structure to be constructed at 133 West Commercial Street. This plan is being submitted by Landry/French Construction on behalf of the Owner. The Construction Management plan contains information pertaining to the overall planning and coordination of the project.

A. Construction Management Principles

The impact of this project during construction will be minimized via the following management practices and principals:

- As articulated on the attached plan (Exhibit A), the Construction Zone will be secured with a combination of jersey barriers, fencing and gates along West Commercial Street and tie-in into the natural barrier at the North side of the project site. These barriers will look to prevent any access into the site from public.

- All Construction activities will be performed within the limits of the site fence to ensure public is never exposed to any risks caused by construction activities. Three entrances will be maintained into and out of the site and will correspond with the final permanent entrances that are depicted on the site plan.

- All deliveries will be scheduled and coordinated to ensure there is minimal off-site queuing required.

- All construction activities will occur within the sound ordinance times.

B. Development Review of Construction Management Plan

Landry/French has developed a comprehensive management plan that will be in place for the duration of the construction timeline (or until permanent/final measures are installed and can be utilized). Again these are depicted on Exhibit A.

Note that Landry/French utilizes a site-specific safety policy for all workers on-site. Each member will complete a job specific safety orientation prior to starting work activities. At no point will the public have access to the project site within the fenced limits.

C. Performance Guarantees, Inspection Fees, Preconstruction Meeting, and Permits

All fees, building permit fee and guarantees will be paid/issued prior to the commencement of construction. All street opening permits will be applied for by the selected site contractor upon award and in hand prior to opening the street for work.

There is no blasting anticipated for this project.

D. Construction Administration and Communication

The contact person for all construction activities for the project will be:

Landry/French Construction

(207) 730-5566

gmitchell@landryfrench.com

Signage will be posted onsite with additional emergency contact information for the selected Superintendent that will be the site contact for the project. An Emergency Call Log will be developed and distributed to the project team (to include subcontractors).

E. Construction Schedule

The Project is expected to commence immediately upon permit issuance (Spring 2020) and be completed no more than 18 months post commencement of work.

All construction activities will adhere to the City of Portland's Noise Ordinances and their applicable timeframes. All deliveries for this project are anticipated to occur during normal working hours (7:00A – 3:30P).

F. Security & Public Safety

Please refer to Exhibit A for the site fencing/gates, traffic and pedestrian routing plan, which will be utilized for the duration of the project. If required by the City, Knox Box Pad Locks will be installed at each gate for fire department emergency access, ensuring that access is always maintained to the Fire Hydrant along the property frontage.

The fire safety program on-site will consist of the following:

- Fire Extinguishers placed throughout the construction site for the duration of the project.
- All employees on-site will be orientated to the site-specific plan that will include an emergency evacuation plan.

G. Construction Permitting and Traffic Control Plans

Temporary barriers will encroach into the Commercial Street ROW but will always ensure that current traffic and pedestrian patterns are maintained.

This project includes new utilities; that will require new taps/tie-ins within the public ROW. All street opening permits will be applied for and approved prior to start of utility work in the street.

H. Site Management and Controls

Landry/French will adopt the following site management and maintenance activities through the duration of the project:

- Trash and Debris will be contained within the project fencing and changed out on a regular basis.
- Street cleaning will not be required on a regular basis but reviewed on a daily basis and cleaned as required to remove dirt/debris caused by the construction efforts. A stabilized temporary construction entrance will be installed at the gate locations and maintained by the selected sitework contractor.
- Noise will comply with City Ordinances.
- If needed, water will be used to control dust during the sitework activities of the project. We do not anticipate any other activities that will require dust control measures.
- Onsite snow removal will be handled by Landry/French.

I. Erosion Control and Preservation of Trees

We will comply with the approved erosion and sedimentation control plan.

J. Construction Staging Area

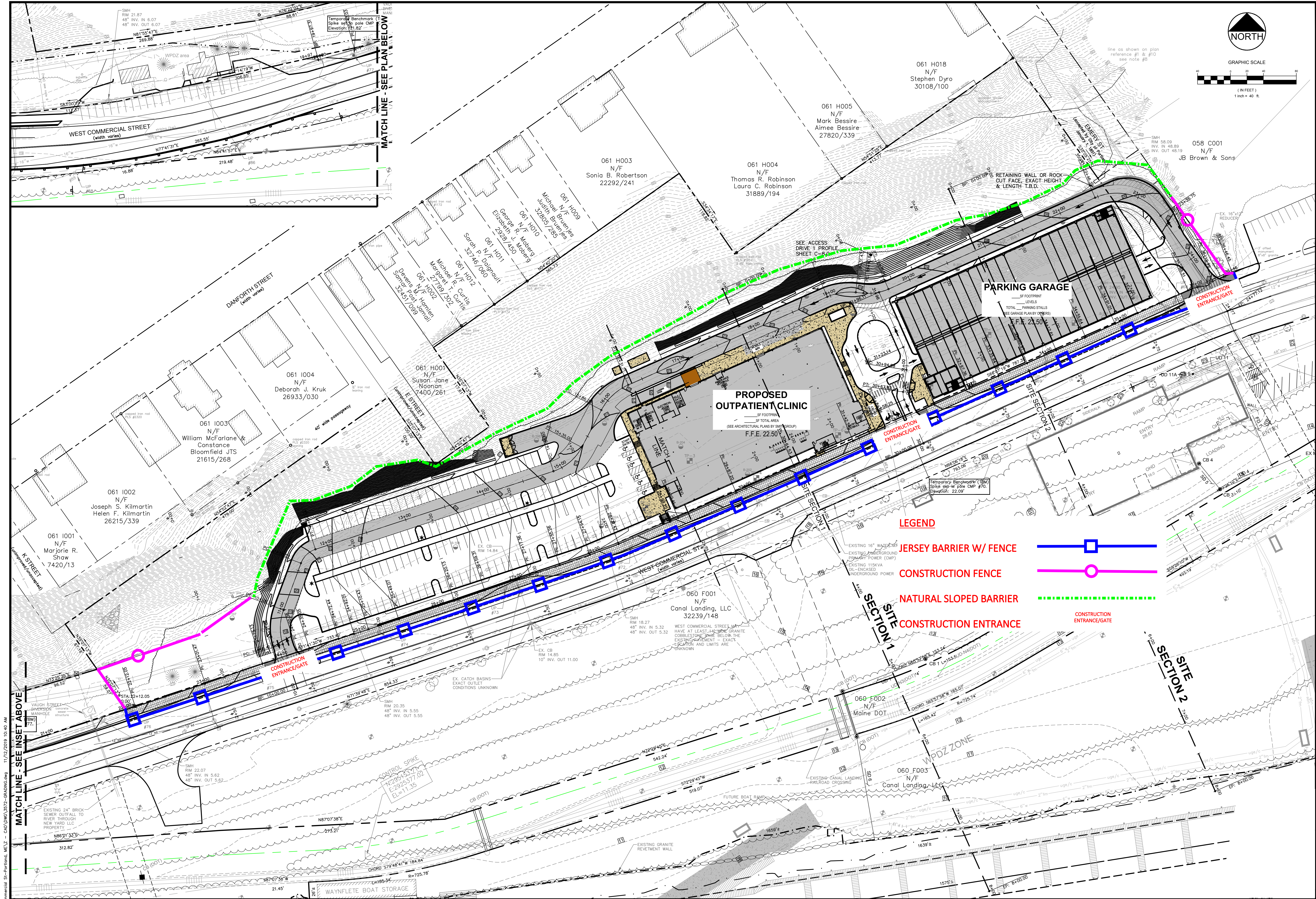
Exhibit A of this document is the site logistics plan for the project.

K. Parking During Construction

On-site parking is expected to be utilized. However, if off-site parking is required, employee parking will be provided by employers utilizing legal parking methods.

L. Special Measures as Necessary

As it is understood currently, no Special Measures will be required.



Commercial St-Portland, ME.Z - CAD UNW 1572-GRADING.dwg 11/12/2019 10:40 AM

Drawing Name:	EXHIBIT A - LANDRY/FRENCH CM PLAN - 11.15.19		
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic		
Client:	FDS JBB PORTLAND, LLC		
	10 Free Street, Portland, Maine 04101		

January 30, 2020

Mr. Andrew Tufts

Planning and Development Department
City of Portland, Maine
389 Congress Street
Portland, Maine 04101-3509

**Subject: VA Community Based Outpatient Clinic (CBOC)
Project ID – PL-0000927-2019
113 West Commercial Street
Letter of Response #1**

Dear Andrew:

On behalf of **FDS JBB Portland LLC** (Applicant), our office is pleased to provide the following responses to various staff comments you provided on January 3, 2020. For ease of review we have repeated the staff comments and provide our responses as follows:

MIKE TREMBLAY, DPW P.E. SENIOR ENGINEER

Site Plan

Comment

The project site has three driveways. A maximum of two driveways is permitted per the technical manual (1.7.2.8). A waiver is required for three driveways. DPW does not support a waiver for a third driveway at this time, given the potential issues with the central driveway, discussed below; three driveways also present three new conflict points along a high-volume, high-speed roadway.

Response

The applicant is proposing three driveways; however, we note that the most easterly driveway is positioned within the Emery Street Right-of Way, thus it could be considered as separate from the other two driveways from the site onto West Commercial Street. We also note that J.B. Brown & Sons owns the adjacent property containing the Star Match Building, just east of the Emery Street Right-of Way. J.B. Brown has committed to closing their existing curb opening just to the east of the Emery Street Right of Way as part of the development of the City sponsored 10' wide mixed-use pathway project. This curb cut measures over 135 feet wide. That small paved parking lot will simply be tied into the Emery Street Driveway.



The net result will be only two new driveways along the West Commercial Street frontage, a distance of over 1,500 LF. By basis of comparison, we note that the development site is within the B-5b Zone where there is no minimum lot size or minimum frontage, thereby, an alternative development scenario consisting of multiple lots could arrive at substantially more driveway openings on West Commercial Street. We note that the driveways provide distinct access for the development as follows:

- The westerly driveway will primarily serve Clinic staff for access to their surface parking lot. The westerly driveway will also provide access for heavy vehicles including the solid waste hauler, large truck deliveries exiting the site and ambulance services.
- The central driveway is the primary site entrance for patients/visitors and it provides direct access to the main Clinic patient building entrance as well as to the parking garage.
- The easterly driveway will provide access to the parking garage as well as for a heavy vehicle entering circulation route around the rear of the site, which is particularly necessary for access to the loading dock. The easterly driveway within the Emery Street Right of Way will also serve for a linkage to the Star Match Building parking lot and it will allow two existing curb openings to be closed.

Comment

The central driveway, used for pick-up/drop-off and as a garage entrance, is problematic. There appears to be very little stacking space for vehicles if the three pickup/dropoff stalls are occupied, which may cause vehicles to spill into West Commercial Street. Additionally, as all patients and visitors using the garage must walk across this driveway, vehicles turning into the driveway may need to wait for pedestrians to cross at two different locations (the shared path and the crosswalk within the site), which may cause conflicts on West Commercial Street. DPW suggests that the central driveway be closed, and the pick-up/drop-off area made accessible solely from the 24-foot access drive behind the site. This gives vehicles ample space to queue for the pick-up/drop-off area if there is congestion in this area; the driver can then quickly enter the garage or exit via the access drive. The path would be continuous between the garage and clinic, with no vehicle conflicts, and no waiver for an additional driveway would be required. Some of the following comments may be addressed, or become moot, if this comment is incorporated.



Response:

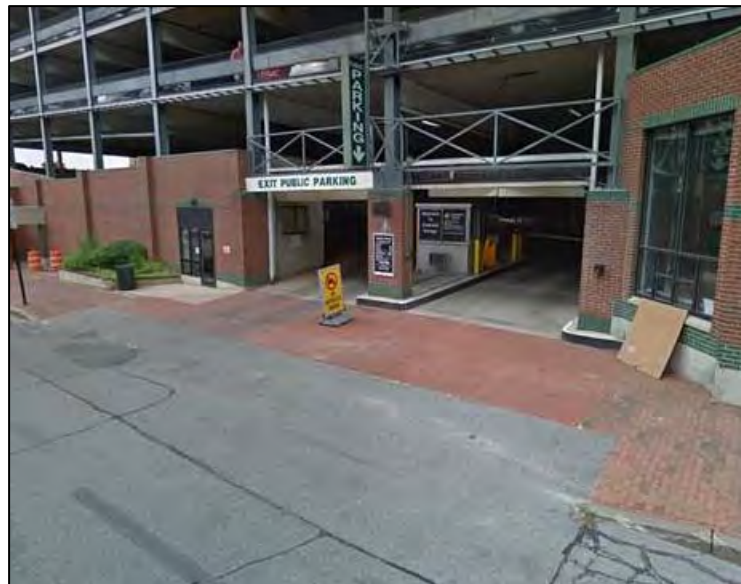
We are not in agreement with the assessment of stacking space as well as the interaction of entering movement traffic and pedestrians crossing between the buildings and/or the mixed-use pathway. Much like many private driveways and urban property access settings there will be the need for entering and exiting vehicles to give way to pedestrians on sidewalks, etc. This is certainly true on the Peninsula, where, for example, at multiple parking garage entrances there is limited queuing capacity at a gate-controlled entrance. Take for example, entrances at the following:



Fore Street



Union Street



High Street Garage

In addition, we note that we are currently evaluating the implementation of either a two-way center left turn lane or dedicated left turn lanes within West Commercial Street, at each of the development driveways. This evaluation is made part of the Traffic Study currently underway by Traffic Solutions and which will be submitted



as part of the Traffic Movement Permit Application to the City. These lanes will provide storage capacity for left turning vehicles into the site, while also minimizing interruption to the thru-traffic movements along the street. Secondly, the available queue of vehicles within the site will be approximately 120' from the crosswalk between the buildings to the first 5-minute drop-off/pick-up parking stall adjacent the clinic. This storage space will provide adequate stacking while also providing an opportunity for vehicles to enter the parking garage, or, if necessary, to circumnavigate the site perimeter via the rear access drive.

Comment

All of the site driveways are wider than permitted by the technical manual (1.7.2.4). Driveways wider than 30 feet, measured at the property line, require a waiver. The western driveway measures about 35 feet at the property line; the central driveway measures about 41 feet, and the easternmost driveway measures about 34 feet wide. At the outer driveways, these widths reflect large curb radii, including a 40 foot curb radius at the western side of the western driveway. At the central driveway, the entering travel lane is 14 feet wide and the exiting right-turn lane is 13 feet wide; both of these widths seem excessive. Vehicle turning templates are requested to confirm that these driveway widths and curb radii are necessary. The Applicant should tighten dimensions where possible, and provide explanation for wider dimensions otherwise.

Response:

The accompanying diagrams show the movement of semitrailer trucks or an emergency vehicle entering/exiting the site. Each of the driveways have been designed to provide adequate maneuvering space for the semi-trailers or a fire truck. The site will be routinely visited by Mobile Imaging trailers (WB-63 equivalent) and also larger tractor trailer deliveries for materials to the Clinic. The latest plans have been updated to reduce the driveway widths as much as possible while also providing adequate curb radii for the assortment of vehicles expected to visit the site, including passenger vehicles up to heavy semitrailer trucks. These are summarized as follows:

- Westerly driveway – 30' wide with 25' radius each side;
- Central Driveway – One 14' wide entering lane; two exiting lanes at 13' for right turns and 11' for left turns. Curb radii will be 20'; and
- Easterly Driveway – 24' wide with 20' exiting radius and 25' entering radius.

Comment

The 24-foot access drive seems excessive for one-way traffic, even for heavy vehicles. Reducing this width would reduce impervious surface and potentially reduce the amount of regrading that is required behind the site. Alternately, this access drive could be utilized by staff and/or patients and visitors in order to be able to remove one of the site driveways, as discussed above.

Response:

The rear access drive behind the garage will be 20' wide to accommodate occasional larger truck access as well as emergency services vehicles. The drive aisle behind the Clinic will be 24' wide as it is a two-way directional drive that must accommodate semitrailer mobile imaging vehicles, emergency vehicles including ambulance service to the rear of the building, and general large trailer truck deliveries to the site.



Comment

The central driveway features a raised crosswalk; however, curb ramps are shown serving this crosswalk. These ramps may not be necessary if the crosswalk is fully raised.

Response:

The design of the raised sidewalk has been updated to reflect the differential height between the raised crosswalk which is 4" high and the sidewalks which are raised 6". There will be a slight ramp condition at the transition from the crosswalk to each sidewalk, but not a full-fledged ramp given the small differential in grade.

Comment:

The alignment of the intersection of the driveway serving the pickup/dropoff area with West Commercial Street is not acceptable. A crosswalk must be shown, the stop bar must be behind the pedestrian crossing area, and the median shall not intrude into the pedestrian crossing area. Additionally, a larger raised table, which begins at a sloped driveway apron at the site entrance, and continuing through the internal crosswalk, should be considered.

Response:

The latest site plans include updates to the pathway crossing at each of the driveways. These include crosswalk pavement markings and stop bars positioned behind the crosswalk markings.

Comment

The surface parking area includes a significant amount of landscaped islands. These islands would appear to potentially cause drainage issues, and will be an obstacle to snow clearance. The allocation of green space within the parking lot should be reconsidered.

Response:

The design includes the use of porous pavement over much of the parking lot area, thus there is not as much concern about drainage patterns and the interruption of sheet flow on the pavement that might be caused by the landscaped islands. We are aware of the impact to winter snow plowing operations caused by the islands; however, the ability to provide screening and shading effects to the parking lot are considered a net positive outcome in this proposed design. The landscape plan for the parking lot includes plantings in the island bump outs as well as a line of trees along the site frontage, all of which are intended to offset the inability to place street trees within the proposed esplanade, due to the underlying utilities in the esplanade. There will be an 8' wide divider island between the two parking bays and that island is intended as a sidewalk condition to allow the employees to walk to/from the building without need of walking in the drive aisles. This condition is improved by the placement of the planted bump out islands, rather than placing trees within the longitudinal divider island, in our opinion.

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Response:

Several areas of snow storage have been identified on the site plan around the site perimeter. Removal of snow from the site may be occasionally required and the owner will contract with a local snow hauler to deal with high snowfall conditions, on an as needed basis.

Comment

The location of the dumpsters and dumpster access driveway should be reconsidered. Garbage trucks would appear to have to make awkward turning movements to service these dumpsters, and the dumpster area necessitates a significant amount of regrading on an embankment that may otherwise be untouched by the project. The dumpsters are also located somewhat far from the clinic.

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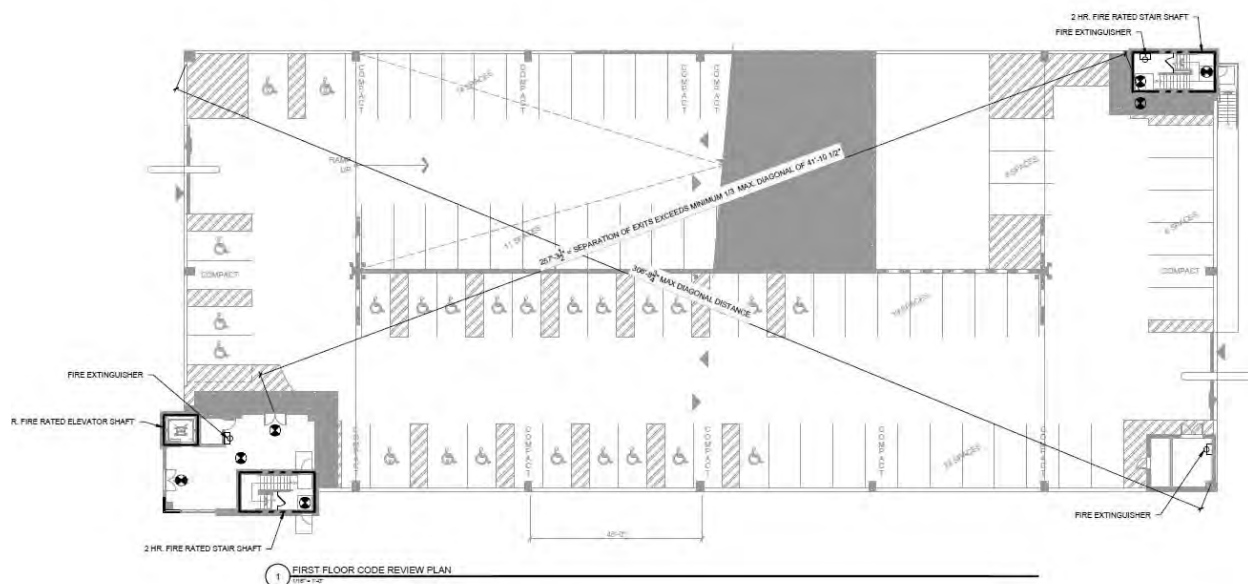
The solid waste enclosure has been shifted to a position closer to the loading dock area at the westerly rear corner of the Clinic. This location will provide improved access for staff as well as the trash removal equipment.

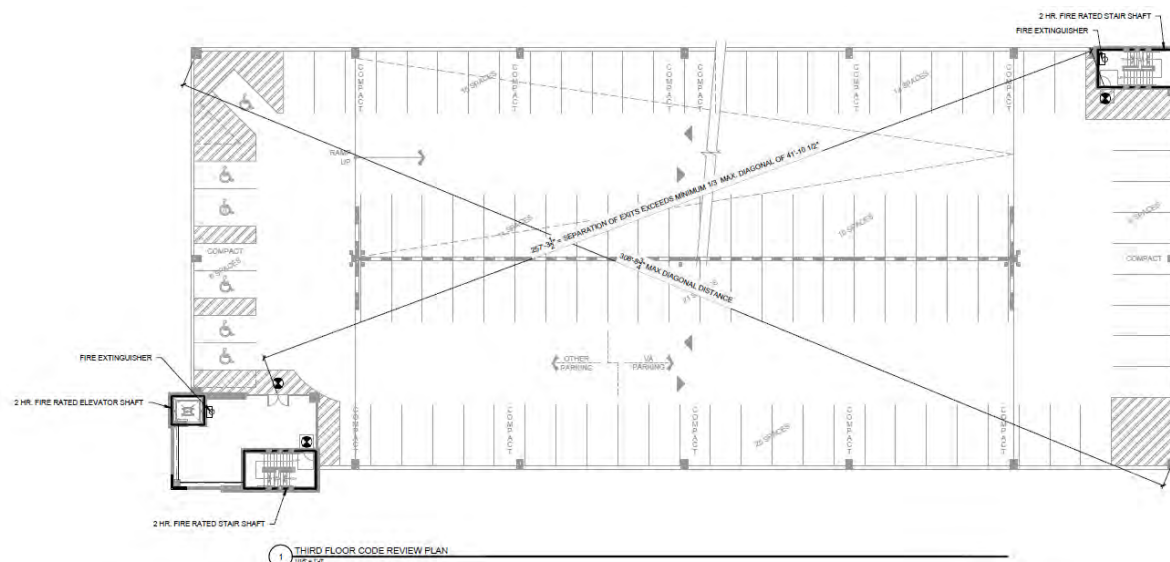
Comment

The parking layout of the parking garage should be provided. Per ADA parking requirements, "Hospital outpatient facilities need 10% of patient/visitor spaces to be accessible." As such, at least 39 accessible parking spaces in the garage are required to be accessible. Of these 39 spaces, 7 are required to be van-accessible.

Response:

The Government has requested 250 parking spaces out of the garage, thus the ADA count for the Clinic in the garage will be 25 spaces. The remaining 132± parking spaces in the garage will include 6 ADA spaces to satisfy the typical requirement for 1 ADA space/25 spaces. There will be a total of 31 ADA spaces in the garage. Updated interior garage layout is under preparation by Ryan Senatore Architecture and will be uploaded to ePlan when completed.





Comment

The 10-foot shared pathway must have a cross-slope of no more than 2.0% constructed. It is suggested that the pathway be designed to 1.5% cross-slope to allow for construction tolerance.

Response:

The pathway is currently depicted with a 1.5% or less cross-slope over its length.

Grading & Drainage

Comment

Spot grades are not provided on any of the grading and drainage plans. Spot grades should be included at critical grade break points, periodically along the front and back of sidewalk, at all grade break points at pedestrian ramps and tipdowns, at entrances and exits to buildings and garages, etc.

Response:

The latest grading and drainage plans include spot grading at critical points in the parking lot and around the site.

Comment

There is very little information on how the site will approach drainage. There is a significant slope at the back of the site which will contribute significant stormwater runoff to the impervious areas of the site. Surface parking lot drainage does not appear to be included. The drainage plan must be included in the site plan package for consideration before DPW will support this application.

Response:

We have completed the grading and drainage plans and stormwater management plans, all of which have been uploaded to eplan for Staff and peer review. Key aspects of the design include:



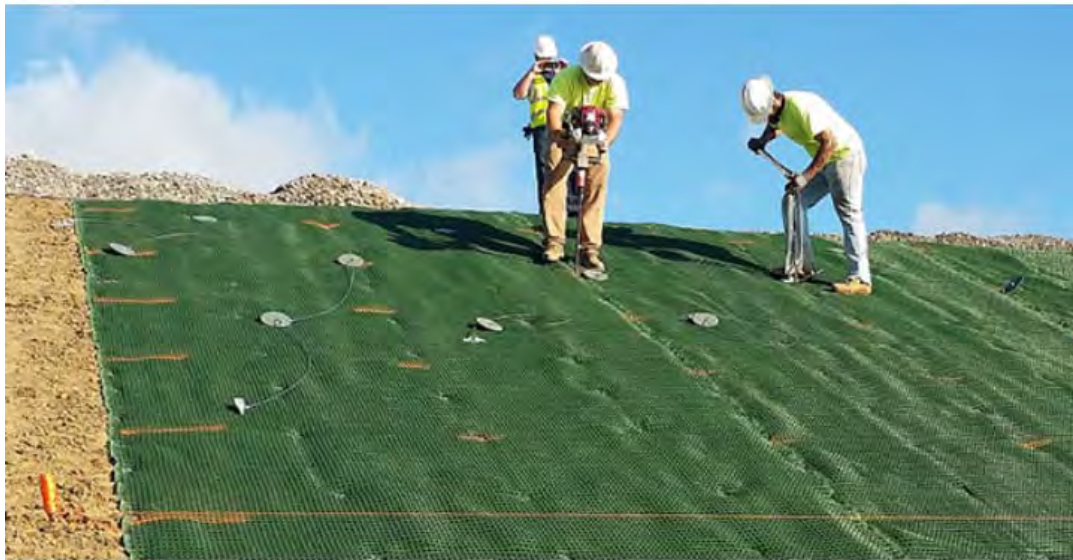
- Porous Asphalt pavement in the staff parking lot will provide water quality treatment and quantity control storage.
- A subsurface sand filter with R-Tank® storage will be provided for water quality treatment of roof runoff.
- A Focal Point™ water quality treatment filter will be provided for a small area of the parking lot water quality treatment.
- A closed collection and conveyance pipe system will capture runoff from the undeveloped hillside and convey it to the existing street system.

Comment

This application proposes significant regrading at the back of the site. Slope stabilization and erosion control measures must be specified on the grading plan, in the details, and in writing. Slope stabilization shall be appropriate given the makeup of the soil in the embankments.

Response:

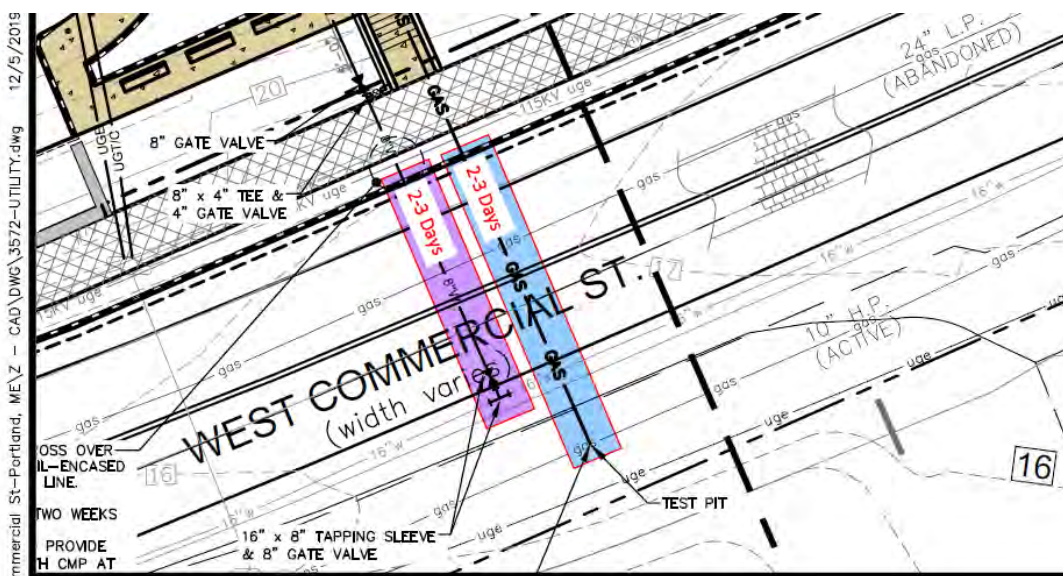
The Erosion and Sediment Control plan, narrative and details are part of the plan documents. Generally, the rear embankment slope will undergo a modest amount of regrading along the rear perimeter of the development. We have attempted to maintain these slope cuts to 2H:1V or shallower where possible although there are several areas at 1:1 for a short height. The Erosion control plans include the use of ArmorMax™ slope reinforcement on all slope steeper than 3:1.



Construction Management Plan

Comment

The locations of utility trenches and duration of work within West Commercial Street must be specified on the CM plan.



Response:

Landry French construction will be updating the CMP and an updated plan will be provided for staff review when completed. Each of the utility trenches in West Commercial Street is expected to require 2-3 days of effort. This includes the water services and the gas service extension. The existing paved road width exceeds 40' so the contractor is planning on maintaining two-way traffic throughout the duration of the work. They may also consider night work to minimize traffic control needs.

Comment

Gas service and water service would appear to require the diversion of West Commercial Street westbound traffic. The Applicant must provide a plan to accommodate traffic during this work.

Response:

The utility work in the street will require temporary traffic controls. Given the existing pavement width on the street at approximately 44', we believe there will be adequate area to allow for the maintenance of two-way traffic during the duration of work for the utility services. Similar circumstances have existed for other projects in the vicinity including the Canal Landing development and satisfactory measures for the maintenance of two-way traffic flow were able to be maintained. As a last resort the completion of the work during nighttime hours may be a possible alternative. The diversion of traffic may involve the use of temporary measures, including barrels, jersey barriers and the use of full-time traffic control personnel.

Comment

The Applicant states that current traffic and pedestrian patterns will be maintained; however, the CM plan shows a construction fence with Jersey barrier that would block the shoulder along West Commercial Street. This shoulder is used by pedestrians and bicyclists. The Applicant should clarify their proposed impact on the roadway, and include a pedestrian management plan if needed. Any construction site that forces pedestrians into vehicle traffic is not acceptable.



Response:

The intent will be not to disrupt pedestrian and bicyclist along West Commercial Street. The placement of any construction barriers will be performed to allow for continuation of two-way travel flow as well as pedestrians movements along the street. The Street has approximately 44' of paved width so we believe that the existing travel conditions should be maintainable while also achieving proper separation of the work zone from the traveling public for safety etc. The contractor will maintain the shoulder at all times except during utility trench work and they will place Jersey Barriers/fencing outside of the shoulder.

Comment

The Applicant should clarify the plan for contractor parking should on-site parking prove insufficient. No on-street parking along West Commercial Street is permitted.

Response:

It is understood that no parking on West Commercial Street will be allowed so the contractor will not use any on-street parking during the course of the work. There will be parking available either onsite or at the nearby Star Match building site.

Lauren Swett - Civil

Comment

*In their online application, their numbers indicate that they are creating 3.6 acres of new impervious surface. Per the statute, Site Law applies to "structures" as follows:
<http://www.mainelegislature.org/legis/statutes/38/title38sec482.html>*

482. 6. B. "Buildings, parking lots, roads, paved areas, wharves or areas to be stripped or graded and not to be revegetated that cause a total project to occupy a ground area in excess of 3 acres. Stripped or graded areas that are not revegetated within a calendar year are included in calculating the 3-acre threshold." I do believe they will need to do a SLOD application, but it will be Delegated Review with the City.

Response:

We agree that the project requires SLODA approval under the City's delegated authority.

Ben Pearson, P.E. DPW

Comment

It appears that the submitted Construction Management Plan does not include a dewatering plan. Likely used an older template than the current one (<https://www.portlandmaine.gov/DocumentCenter/View/18030/General-Construction-Management-Template>). If this plan moves forward, a dewatering plan is required. It is likely that they will need to pump groundwater from the site during construction and we want to know what their plans are.

Response:

Based on the findings of the geotechnical investigations groundwater is not expected to be encountered during the performance of work. The Erosion Control plan contains a note regarding dewatering, if required, restricting



all dewatering effluent to be managed and discharged onsite or thru the use of a frac tank. No dewatering effluent will be allowed to be discharged to the City systems.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

GORRILL-PALMER

Stephen Bushey, PE

Senior Associate

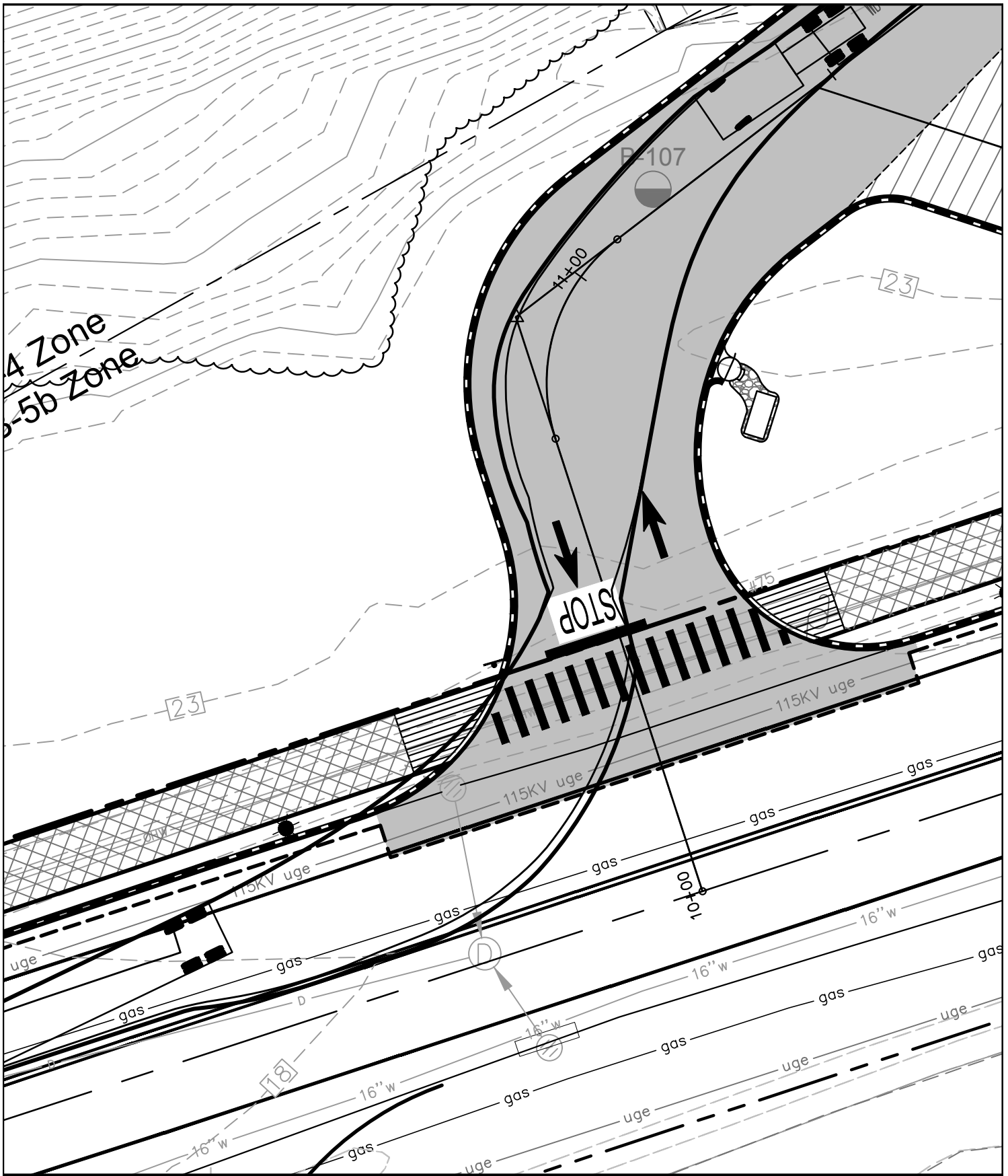
Phone: 207-772-2515 x286

sbushey@gorrillpalmer.com

Attachments

c: FDS – Claiborne Williams
JBB – Vin Veroneau
SmithGroup – Greg Heppner
Landry French – Mason Rowell

u:\13572_va clinic west commercial st-portland, melp applications\local\level iii site plan application\lor\lor#1\lor#1_tufts_01.30.2020.docx



VEHICLE TURNING - WB-62 AT WEST DRIVEWAY

VA Clinic, West Commercial Street, Portland, Maine



Design: KAB	Date: JAN. 2020
Draft: CDD	Job No.: 3572
Checked: SRB	Scale: 1" = 20'
File Name: 3572-PBASE.dwg	

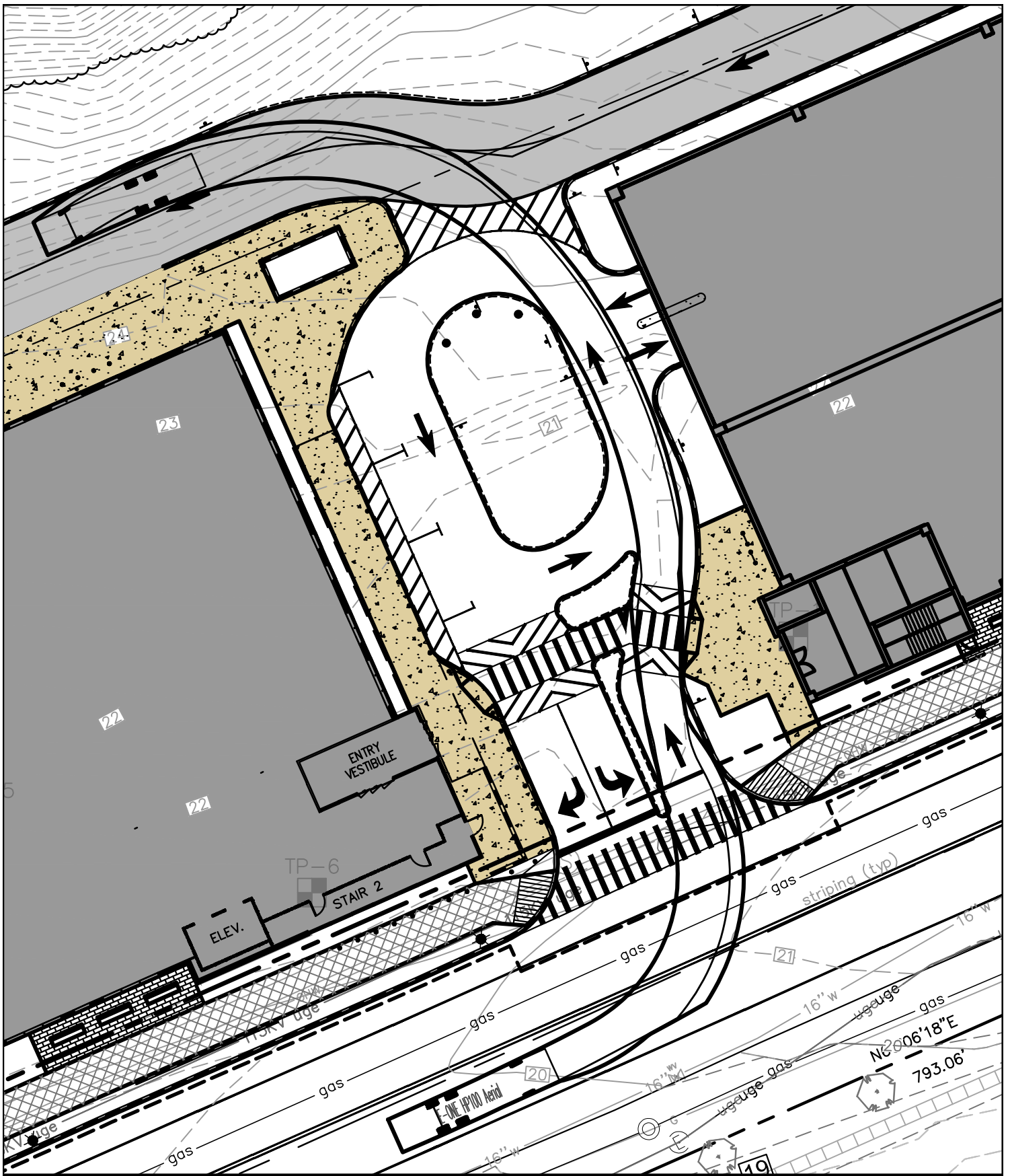


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Figure

1





VEHICLE TURNING - HP-100 AERIAL FIRE TRUCK AT CENTRAL DRIVEWAY

VA Clinic, West Commercial Street, Portland, Maine



Design: KAB	Date: JAN. 2020
Draft: CDD	Job No.: 3572
Checked: SRB	Scale: 1" = 30'
File Name: 3572-PBASE.dwg	



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Figure

3



707 Sable Oaks Drive, Suite 30
South Portland, ME 04106
207.772.2515

March 26, 2020

Mr. Andrew Tufts

Planning and Development Department
City of Portland, Maine
389 Congress Street
Portland, Maine 04101-3509

**Subject: VA Community Based Outpatient Clinic (CBOC)
Project ID – PL-0000927-2019
141 West Commercial Street
Letter of Response #2**

Dear Andrew:

On behalf of **FDS JBB Portland LLC** (Applicant), our office is pleased to provide the following updated responses to various staff comments you provided within an email dated February 19, 2020, which contained an updated version of your original January 3, 2020 comment letter. Our Letter of Response #1, issued on January 30, 2020, contained responses to each of the staff comments from the original letter. For ease of review we have repeated all of the staff comments and provide our responses as follows. The original comments/responses are identified in black and the updated comments responses are in red. **At the end of this letter we also provide supplemental information related to the February 25, 2020 Staff Report and comments brought forth by the Planning Board at that meeting (red).**

MIKE TREMBLAY, DPW P.E. SENIOR ENGINEER

Site Plan

Comment

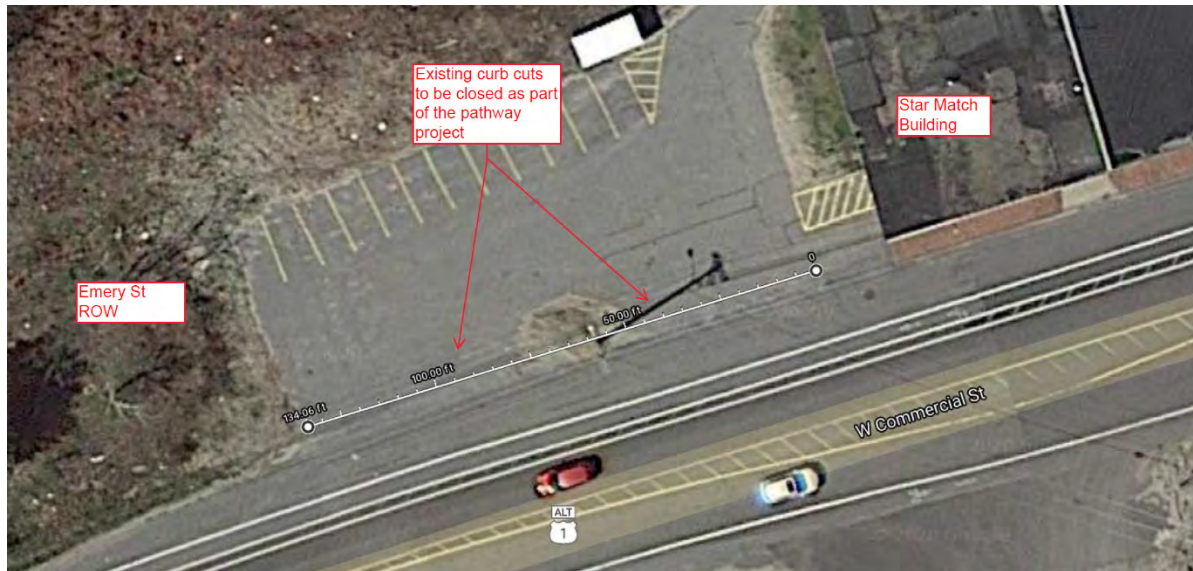
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Response

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of the development of the City sponsored 10' wide mixed-use pathway project. This curb cut measures over 135 feet wide. That small paved parking lot will simply be tied into the Emery Street Driveway.



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Response

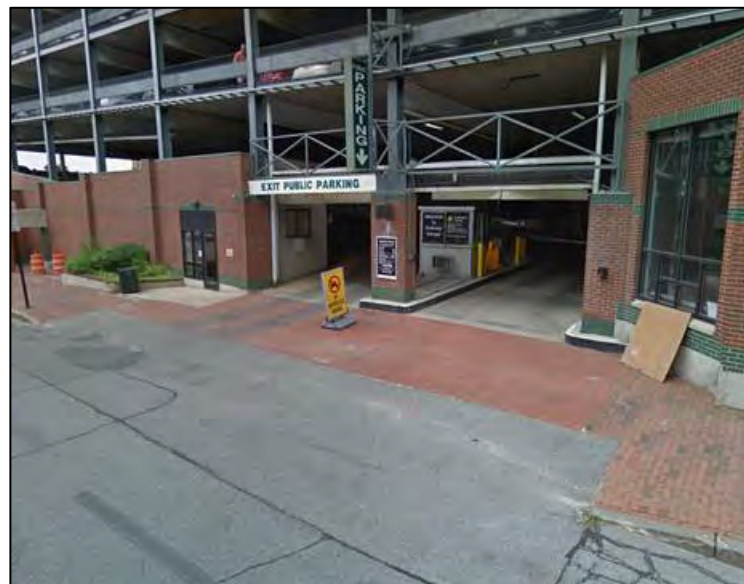
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In addition, we note that we are currently evaluating the implementation of ~~either~~ a two-way center left turn lane ~~or dedicated left turn lanes~~ within West Commercial Street, at each of the development driveways. This evaluation is made part of the Traffic Study currently underway by Traffic Solutions and ~~which will be~~ **has been** submitted as part of the Traffic Movement Permit Application to the City. These lanes will provide storage capacity for left turning vehicles into the site, while also minimizing interruption to the thru-traffic movements along the street. Secondly, the available queue of vehicles within the site will be approximately 120' from the crosswalk between the buildings to the first 5-minute drop-off/pick-up parking stall adjacent the clinic. This storage space will provide adequate stacking while also providing an opportunity for vehicles to enter the parking garage, or, if necessary, to circumnavigate the site perimeter via the rear access drive. **In response to a conference call with City staff and Tom Errico, our traffic consultant, Bill Bray is collecting additional data from the VA regarding anticipated traffic related to drop-off/pick-up volumes and related information to provide staff. This information is expected to help with better understanding the expected queue volumes at the Clinic entrance and at the garage.**

Comment

All of the site driveways are wider than permitted by the technical manual (1.7.2.4). Driveways wider than 30 feet, measured at the property line, require a waiver. The western driveway measures about 35 feet at the property line; the central driveway measures about 41 feet, and the easternmost driveway measures about 34 feet wide. At the outer driveways, these widths reflect large curb radii, including a 40 foot curb radius at the western side of the western driveway. At the central driveway, the entering travel lane is 14 feet wide and the exiting right-turn lane is 13 feet wide; both of these widths seem excessive. Vehicle turning templates are requested to confirm that these driveway widths and curb radii are necessary. The Applicant should tighten dimensions where possible, and provide explanation for wider dimensions otherwise.

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The location of the dumpsters and dumpster access driveway should be reconsidered. Garbage trucks would appear to have to make awkward turning movements to service these dumpsters, and the dumpster area necessitates a significant amount of regrading on an embankment that may otherwise be untouched by the project. The dumpsters are also located somewhat far from the clinic.

Response

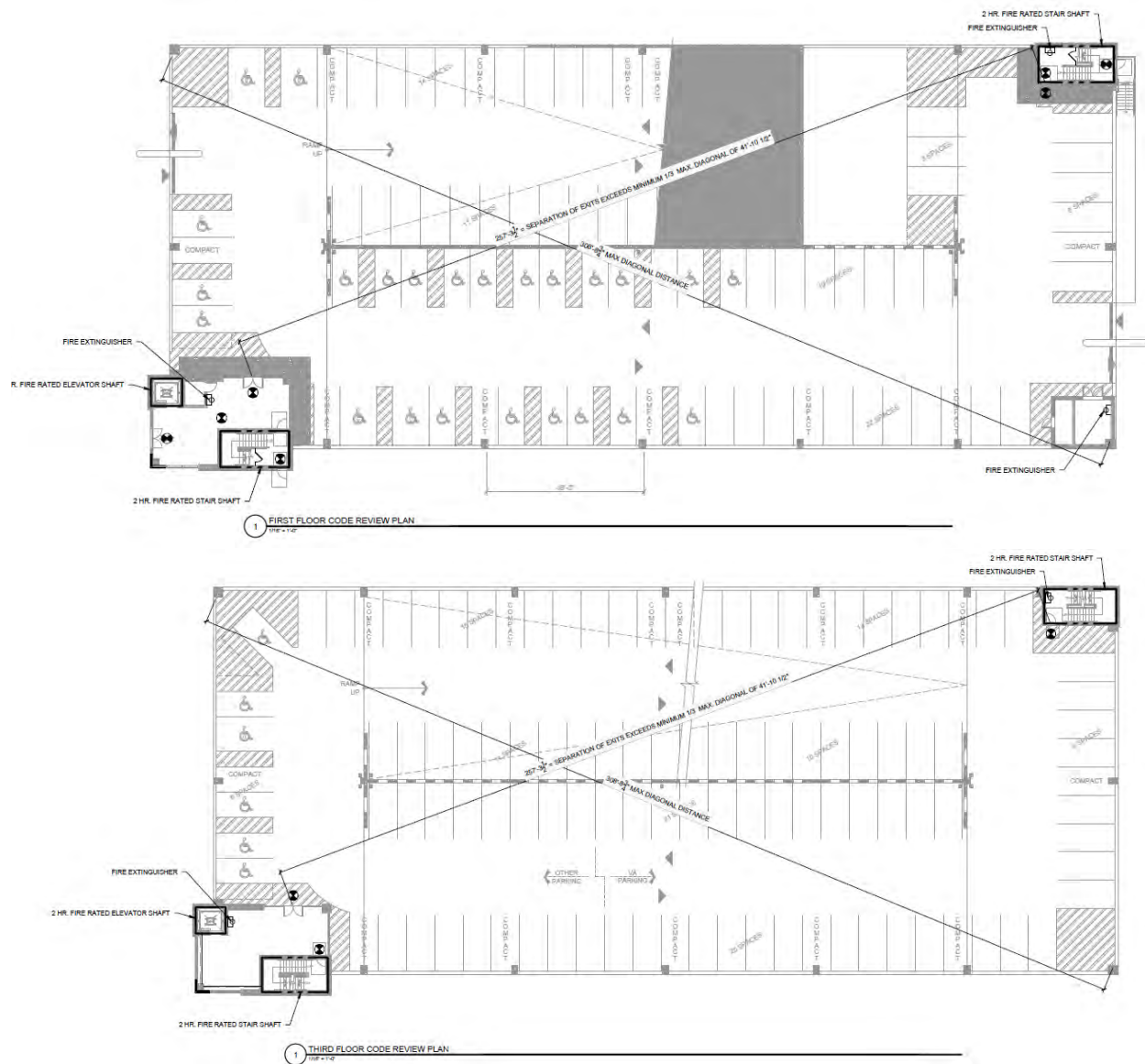
The solid waste enclosure has been shifted to a position closer to the loading dock area at the westerly rear corner of the Clinic. This location will provide improved access for staff as well as the trash removal equipment.

Comment

The parking layout of the parking garage should be provided. Per ADA parking requirements, "Hospital outpatient facilities need 10% of patient/visitor spaces to be accessible." As such, at least 39 accessible parking spaces in the garage are required to be accessible. Of these 39 spaces, 7 are required to be van-accessible.

Response:

The Government has requested 250 parking spaces out of the garage, thus the ADA count for the Clinic in the garage will be 25 spaces. The remaining 132± parking spaces in the garage will include 6 ADA spaces to satisfy the typical requirement for 1 ADA space/25 spaces. There will be a total of 31 ADA spaces in the garage. ~~Updated interior garage layout is under preparation by Ryan Senatore Architecture and will be uploaded to ePlan when completed.~~ The latest garage elevations and floor plans have been uploaded to EPlan.



Comment

The 10-foot shared pathway must have a cross-slope of no more than 2.0% constructed. It is suggested that the pathway be designed to 1.5% cross-slope to allow for construction tolerance.

Response

The pathway is currently depicted with a 1.5% or less cross-slope over its length.

Grading & Drainage

Comment

Spot grades are not provided on any of the grading and drainage plans. Spot grades should be included at critical grade break points, periodically along the front and back of sidewalk, at all grade break points at pedestrian ramps and tipdowns, at entrances and exits to buildings and garages, etc.



Response

The latest grading and drainage plans include spot grading at critical points in the parking lot and around the site.

Comment

There is very little information on how the site will approach drainage. There is a significant slope at the back of the site which will contribute significant stormwater runoff to the impervious areas of the site. Surface parking lot drainage does not appear to be included. The drainage plan must be included in the site plan package for consideration before DPVW will support this application.

Response

We have completed the grading and drainage plans and stormwater management plans, all of which have been uploaded to eplan for Staff and peer review. Key aspects of the design include:

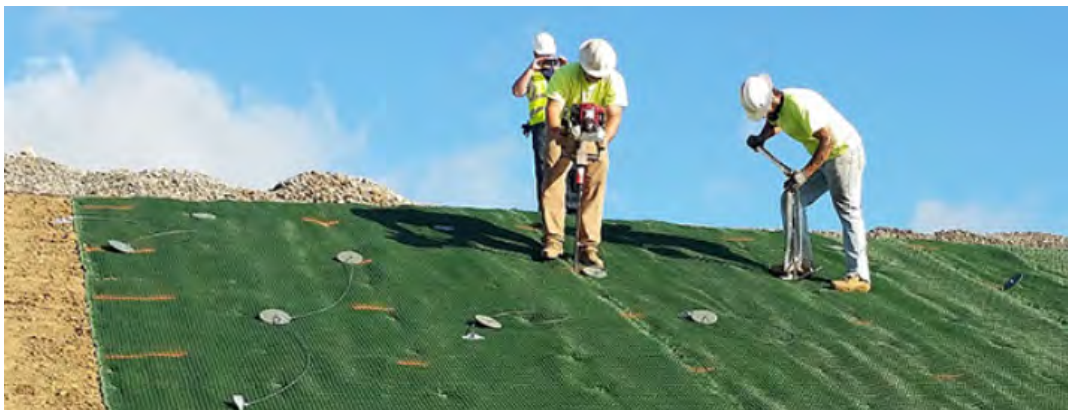
- Porous Asphalt pavement in the staff parking lot will provide water quality treatment and quantity control storage.
- A subsurface sand filter with R-Tank® storage will be provided for water quality treatment of roof runoff.
- A Focal Point™ water quality treatment filter will be provided for a small area of the parking lot water quality treatment.
- A closed collection and conveyance pipe system will capture runoff from the undeveloped hillside and convey it to the existing street system.

Comment

This application proposes significant regrading at the back of the site. Slope stabilization and erosion control measures must be specified on the grading plan, in the details, and in writing. Slope stabilization shall be appropriate given the makeup of the soil in the embankments.

Response

The Erosion and Sediment Control plan, narrative and details are part of the plan documents. Generally, the rear embankment slope will undergo a modest amount of regrading along the rear perimeter of the





during nighttime hours may be a possible alternative. The diversion of traffic may involve the use of temporary measures, including barrels, jersey barriers and the use of full-time traffic control personnel.

Comment

The Applicant states that current traffic and pedestrian patterns will be maintained; however, the CM plan shows a construction fence with Jersey barrier that would block the shoulder along West Commercial Street. This shoulder is used by pedestrians and bicyclists. The Applicant should clarify their proposed impact on the roadway, and include a pedestrian management plan if needed. Any construction site that forces pedestrians into vehicle traffic is not acceptable.

Response

The intent will be not to disrupt pedestrian and bicyclist along West Commercial Street. The placement of any construction barriers will be performed to allow for continuation of two-way travel flow as well as pedestrians movements along the street. The Street has approximately 44' of paved width so we believe that the existing travel conditions should be maintainable while also achieving proper separation of the work zone from the traveling public for safety etc. The contractor will maintain the shoulder at all times except during utility trench work and they will place Jersey Barriers/fencing outside of the shoulder.

Comment

The Applicant should clarify the plan for contractor parking should on-site parking prove insufficient. No on-street parking along West Commercial Street is permitted.

Response

It is understood that no parking on West Commercial Street will be allowed so the contractor will not use any on-street parking during the course of the work. There will be parking available either onsite or at the nearby Star Match building site.

Lauren Swett - Civil

Comment

In their online application, their numbers indicate that they are creating 3.6 acres of new impervious surface. Per the statute, Site Law applies to "structures" as follows:

<http://www.mainelegislature.org/legis/statutes/38/title38sec482.html>

482. 6. B. "Buildings, parking lots, roads, paved areas, wharves or areas to be stripped or graded and not to be revegetated that cause a total project to occupy a ground area in excess of 3 acres. Stripped or graded areas that are not revegetated within a calendar year are included in calculating the 3-acre threshold." I do believe they will need to do a SLOD application, but it will be Delegated Review with the City.

Response:

We agree that the project requires SLODA approval under the City's delegated authority.



Comment

As previously noted, the project will meet the area thresholds for Site Location of Development, but also meets the SLODA area thresholds for Delegated Review. An application that includes the application form as well as narrative that addresses all applicable Site Law standards should be provided. Many of these items are already addressed as part of the Level III Site Plan Application. The Applicant will be required to contact applicable review agencies including MHPG, MNAP, and MDIF&W. Paper copies are required to be submitted to the City for submission to the MaineDEP.

Response

The accompanying information included with this submission relates to the Site Location of Development requirements for the site. Supplemental information from the various agencies is also contained in the attachment.

Comment

The project will require new electrical, gas, sewer, and water services to the clinic and power and sewer to the garage, which are existing within West Commercial Street. The Applicant shall confirm with each of the respective utilities the ability to serve the project and provide the City with documentation from each utility. The Existing Conditions & Removal Plan also notes "Relocate Utility Pole (By Others) Requires Coordination with CMP"; the Applicant should provide clarification on the plans for the utility pole relocation.

Response

The development team continues to work with the utility providers for their determination letters on available capacity. These will be provided to the Planning Department immediately upon receipt.

Comment

The project is required to comply with stormwater management regulations in accordance with Maine DEP Chapter 500 and City of Portland Technical Manual Chapter 5 stormwater regulations. The project will also be required to meet the standards as required for a Site Location of Development permit.

- *Basic Standards: The Applicant is providing erosion and sedimentation controls in conformance with the Basic Standards.*
- *General Standards: The proposed stormwater management system achieves the required developed area treatment standard of 80% by treating 85.59% of the developed area. However, the overall treatment percentage for impervious areas fall below the 95% treatment standard, treating 93.16% of the new impervious area. The applicant proposes to increase the runoff treatment depth from the porous pavement section and employ a catch basin filter cartridge in the loading dock truck well in order to supplement the impervious area that cannot be treatment due to grade restrictions and existing utilities within the ROW. We are in agreement with this approach to providing treatment.*
- *Flooding Standards: The Applicant has requested a waiver from the flooding standard. The increase in flow at POI is significant, and is not at a level where we would typically allow for a waiver. The Applicant has noted that this is a location that currently sees offsite/street flooding, and that the project will only result in a small increase in the existing negative condition. The Applicant should provide additional on-site stormwater storage – the project*



should not increase stormwater flow to the City's infrastructure, and should not make a flooding condition offsite worse. We will continue to review the details of the stormwater design, but suggest that the Applicant consider their alternatives for meeting the Flooding Standard.

Response

The development team continues to coordinate with the Public Works Department (Justin Pellerin) on the evaluation of options for addressing the drainage for West Commercial Street. Current consideration is being given to the installation of a new drainage line collection system with linkage to the existing CSO infrastructure located to the west of the site, with an existing outfall to the River. We request that the resolution to the analysis and final improvement strategy be made a condition of approval, subject to the issuance of a Certificate of Occupancy. As of this date, GP has outlined a potential drainage improvement approach that consists of new drainage infrastructure, including a 30" drain line, in West Commercial Street that will tie into the existing 24" square CSO line that exits the Vaughn Street diversion structure, just west of the VA site. The improvements will include removal and replacement of multiple catch basins and manholes. The VA site drainage system will tie into the new system and ultimately these flows will outfall to the Fore River. The improvement project, to be undertaken by the City later this year, will address an existing drainage issue in the street and also accommodate the proposed VA Clinic project. As of this writing the City's DPW has engaged this office to complete design plans and contract documents for the performance of this project.

Ben Pearson, P.E. DPW

Comment

It appears that the submitted Construction Management Plan does not include a dewatering plan. Likely used an older template than the current one (<https://www.portlandmaine.gov/DocumentCenter/View/18030/General-Construction-Management-Template>). If this plan moves forward, a dewatering plan is required. It is likely that they will need to pump groundwater from the site during construction and we want to know what their plans are.

Response

Based on the findings of the geotechnical investigations, groundwater is not expected to be encountered during the performance of work. The Erosion Control plan contains a note regarding dewatering, if required, restricting all dewatering effluent to be managed and discharged onsite or thru the use of a frac tank. No dewatering effluent will be allowed to be discharged to the City systems.

Jeff Tarling, City Arborist

Comments

In review of the tree & landscape plan for the proposed development at 113 West Commercial Street would like to offer the following review & comments:

- a) Existing site conditions, tree saves, limit of clearing - Unfortunately, the proposed project does not include much in the way of 'tree saves' of the existing mature trees on the site and the clearing limit extends up the current slope towards the residential Danforth Street backyard edge. This is likely due to the grading needed to accommodate the building size and proposed surface parking. After reviewing the 'Exist & Removals' sheet and*



the landscape plan for both the East & West side, would recommend that the residential side of the project receive landscape buffering treatment mimicking the natural mix of vegetation currently on site. This would include native plant selections, that could include: plants like Red Oak, Bear Oak, Swamp White Oak, Grey Birch, River Birch, Pitch Pine, Red Cedar; along with native shrub types that would fit into the site conditions of dry gravel soils, full sun. This planting could use smaller plant sizes and grouped together in groves. The end result would be that the proposed project fit into the existing landscape if extensive site work wasn't needed... or close to what is existing. This recommendation would help buffer the project and improve the residential view towards the Fore River.

Response

The landscape plans have been updated to include some additional plantings along the slopes at the rear of the site. There are several zones, as identified on the plans, where excess fill material, produced during the course of construction, can be placed, graded and then made suitable for planting some more trees. In addition, there are many existing trees on the slopes that will be retained since there will be no disturbance to them. Several years ago, the owner did undertake a tree cutting program of the hillside and a lot of vegetation/trees was removed to address the prevalence of homeless encampments that was occurring at the time. While much was removed, there does remain some mature tree coverage. These trees combined with the new plantings should yield an improved appearance and buffering to the residential sites off Danforth Street to the north.

- b) Street trees - West Commercial Street is a major connector arterial and gateway into Portland, thus street trees and landscape are important features. Overhead utility lines are existing along West Commercial Street bordering the project site. Street trees along this section of West Commercial Street need to have a lower growing height and or canopy shape and location as to avoid future conflict with these lines. We can work with the project team on both potential tree types and spacing.*

Response

We have provided canopy trees on the site adjacent to the row/front property line that are sufficient distance from the power lines to avoid long term conflict with the wires. Due to the existing underground utilities within in the proposed esplanade, no street trees within the Right of Way will not be possible. The primary utility conflict is an existing 115 KVA high voltage underground power transmission line that runs nearly the full length of the site street frontage. There is also the existing 48" sanitary sewer interceptor main that is also within 5' of the esplanade. Although relatively deep, it is also thought that placement of any trees over or adjacent the sewer main is also not desirable.

So, the design includes a row of seven (7) Princeton American Elms that will be located behind the proposed retaining wall that will separate the site from the back of the proposed pedestrian pathway along the street front west of the VA Clinic. The Elms will alternate with four (4) Red Sunset Maples located in the parking lot, just slightly further behind the row of Elms. This will achieve an effect of eleven (11) substantial tree plantings within a length of approximately 500 LF of the site's street frontage. There will also be ten 910 Swamp White Oaks planted in front of the Clinic and garage.

- c) Parking lot trees & landscape - The surface parking area will need to meet parking lot tree & landscape standards. These standards help projects meet both the buffering needed for surface lots and the environmental*



benefits of shading pavement reducing the urban 'heat island' effect. We can work with the project team on plant suggestions and spacing while recognizing space for snow storage. We have seen some impressive, sustainable landscape featuring low maintenance plantings of Sweet Fern, Bayberry for screening and tough trees like Honeylocust for the parking lot, as an example.

Response

The planting islands are planted with daylilies which are hardy salt tolerant plants with along with Red Maple canopy trees for providing shade in the parking area. The proposed retaining wall that runs along the street-side of the parking lot is planned to have a top of wall 30" above the parking lot elevation. This height will effectively screen parked cars from the public street and sidewalk. The landscape design meets the city standards and provides for the required number of street trees. There is a total of 1,294 feet of frontage, divided by the required minimum spacing of 45 feet yields a total of 29 trees. 19 of these trees are proposed adjacent to the street right of way, and the remaining number are provided in two groupings at the bottom of the slope behind the proposed buildings.

d) Invasive plants - In larger sites like West Commercial Street we try to look at the level of invasive plants and controlling them during the construction phase if possible. This helps reduce the spread of the plants after construction when they might have new 'opportunities' and helps keep them from spreading to nearby backyards. We would request the project take closer look at invasives and include a plan of action to reduce their spread.

Response:

A plan note has been provided requiring the contractor to ensure clean fill is brought to the site that is not from a site known to have invasive weeds. In addition, the site contractor is required to inspect the site for invasive weeds during construction and remove any that are found through the use of physical means and/or the use of appropriate herbicides as may be allowed by the City and/or MaineDEP.

Fire – Chief Robert Thompson

Comments

- *This site plan needs to be submitted to City of Portland Public Works Engineering so the E911 Addressing Officer can assign an official street address to the project.*
- *The address of the parking garage shall be 101 W. Commercial Street*
- *The address of the office building shall be 141 W. Commercial Street*
- *The street address of each building shall be clearly marked on the front of the building, as approved by the Fire Department*
- *Elevators shall be a minimum of 84" x 24"*
- *Any canopy or archway shall provide a minimum clearance of 13' 6".*

Response:

We will contact the E911 addressing officer at DPW and make them aware of the project and the Chief's comments. Elevators will be at least 84" x 24" and there will be no canopy conflicts.



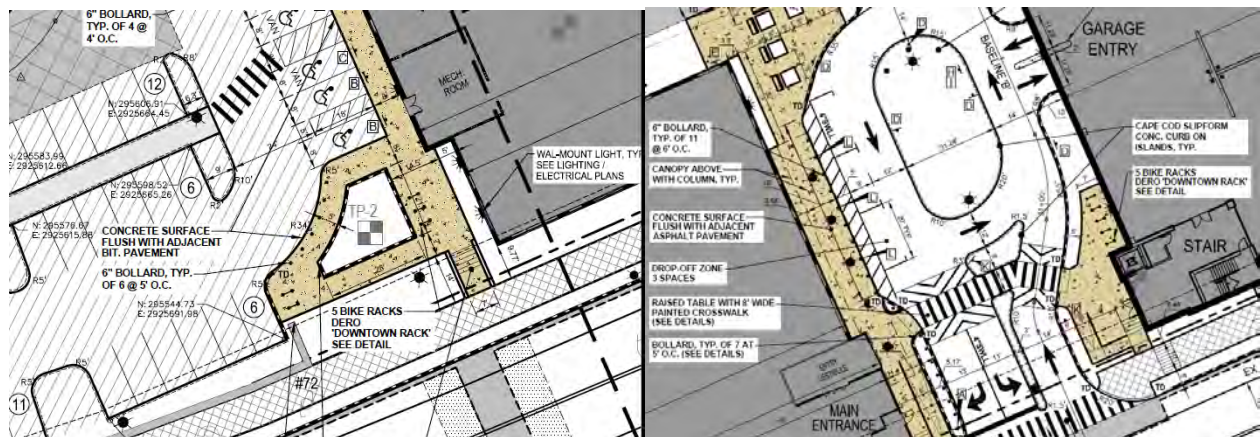
Transportation – Bruce Hyman

Comment

- In response to the bike parking proposed as part of the project. I've noted two groupings of two bike racks for a combined proposed bike parking of 8 spaces. Given the location of the future clinic adjacent to the West Commercial Street Shared Use Pathway, I would recommend a minimum of ten bike racks for a bike parking capacity of 20 bikes initially. In the forthcoming TDM Plan, I recommend it state that the parking utilization will be monitored and the parking supply increased as use/demand warrants.*

Response

A total of ten Dero “Downtown” racks will be provided for the Clinic. Five (5) racks will be provided on the west side of the building (Employee side) per below and five (5) will be provided on the east side per below.



- I would suggest 5 bike racks located at the employee entrance side of the clinic and 5 racks located at the patient/client entrance side of the building. There appears to be ample concrete surfaces at both locations upon which to mount surface mount Downtown Racks as noted on the Detail Sheet C-10.1. The Site Plan notes 'Bike Hitches' which are a different Dero bike rack and the detail and the plan note should be reconciled.*

Response

The detail sheet has been updated to properly identify the “Downtown” rack. We have shown the five racks near the patient entrance positioned near the garage since the VA does not desire to have bike racks near the main building entrance as a matter of course.

- I also note that the spacing of the racks shown in both locations is only 4' when scaled off the plans. In the configuration shown (end-to-end), the racks are to be spaced a minimum of 6' on center. This is the same configuration and spacing used at the WEX site. The 3'-4' spacing used on the plans is when the racks are placed side-by-side, not as shown in the plans.*



Response

The proposed racks are spaced at 4' o.c. which exceeds the minimum 36" spacing suggested by the Manufacturer's details.

CLOSURE

We have completed updated plans and supporting materials for the site that have been uploaded to Eplan. These include the following:

- Stormwater Management Report including Draft Stormwater Maintenance Agreement;
- MaineDEP Site Location of Development Application Materials and Supporting Documents;
- Full Site Civil and Landscape plans including Updated Parking Lot Layout;
- Updated Building Elevations for the Clinic and the Parking Garage;
- Updated Site Lighting Plans based on Review of the VA; and
- West Commercial Street improvements plans to depict the development of a two way center left turn lane along the length of the site.

We look forward to the next available placement on the Planning Board's agenda for a Public hearing.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

GORRILL-PALMER

A handwritten signature in blue ink, appearing to read 'Stephen Bushey', with a long horizontal flourish extending to the right.

Stephen Bushey, PE
Senior Associate
Phone: 207-772-2515 x286
sbushey@gorrillpalmer.com

Attachments

c: FDS – Claiborne Williams
JBB – Vin Veroneau
SmithGroup – Greg Heppner
Landry French – Mason Rowell

SECTION 12

STORMWATER MANAGEMENT REPORT

**VA CLINIC
113 WEST COMMERCIAL STREET
PORTLAND, MAINE**

Prepared for

**FDS JBB Portland LLC
10 Free Street
Portland, Maine 04101**

Prepared by

**Gorrill Palmer
707 Sable Oaks Drive – Suite 30
South Portland, Maine 04106
207.772.2515**

**January 2020
*Revised March 2020***

STORMWATER MANAGEMENT REPORT

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Figures

- W-1 Pre development Watershed Map
- W-2 Post development Watershed Map

Attachments

- A Pre development Runoff Calculations
- B Post development Runoff Calculations
- C Water Quality Calculations
- D FocalPoint® Design Worksheet/Checklist
- E Autodesk Storm and Sanitary Analysis
- F Geotechnical Report
- G Operation & Maintenance Manual

12.0 **Introduction**

FDS JBB Portland LLC is proposing to construct a Community Based Outpatient Clinic within a portion of property located at 141 West Commercial Street in Portland, ME. The facility will serve as a VA Outpatient Clinic and will be referred to in this report as the “VA Clinic”. The property being developed is approximately 8.40 acres. The development will consist of the following:

- A 34,155 SF footprint, two-story outpatient facility (total GLA = 62,300 SF); and
- A 35,880 SF footprint, multi-level parking structure for 382 spaces, with a 150 space, surface parking lot.

The purpose of this analysis and report is to document what measures will be implemented to provide stormwater management for the project, what is required to control the peak rate of discharge during large storm events, and to provide treatment to stormwater runoff as determined by MaineDEP’s Chapter 500 Rules and City of Portland Technical Standards for Stormwater Management. Both the impact on peak rates of runoff and water quality measures are considered in this evaluation.

Erosion and Sedimentation Controls (Basic Standards) will be employed during the construction of this project and are summarized in the Erosion and Sedimentation Control Plans provided on Sheets C-5.3, C-10.5, and C-10.6.

12.1 **Existing Site Conditions**

The project site is bounded to the south by West Commercial Street/U.S. Route 1A; to the east by the Star Match Building site and undeveloped Emery Street Right of Way; to the north by the West End residential neighborhood on Danforth Street; and to the west by undeveloped land and a currently vacant Restaurant site (formerly Bennie’s Clam Shack). The property has approximately 1395’± of frontage on West Commercial Street and is directly across the street from the Portland Yacht Services/Canal Landing property that is on the Fore River. The property was once the site of the rail yard for the historic Portland Star Match Building which was built in 1870¹. Up to as many as nine rail spurs operated on the site at least to the early 1900’s, with continued use of the tracks and yard for the storage of iron and steel occurring thru the late 1960’s. Today, one disconnected rail spur is still present and various remnant railroad ties are visible on the ground surface across the site. The site today is mostly characterized by tall grasses and brush on the south side with thinly wooded area and brush on the northern side of the site.

West Commercial Street is a major artery into the Portland peninsula and Old Port District. It also contains major utilities that service the surrounding area. These include a 115 kV underground electric transmission line, 3-phase overhead electric and communications facilities, and the 48” Fore River Interceptor sanitary sewer line that runs along the property frontage. A 10” high-pressure natural gas main and 16” Portland Water District water main are also located in West Commercial Street, but are not located directly along the property frontage. A 36” combined sewer line, that serves the West End neighborhood, flows through the Emery Street Right of Way from North to South and connects to a diversion structure on the south side of West Commercial Street. These utilities are identified on the Existing Conditions and Removals Plan, Sheet C-3.0.

¹ See Phase 1 Environmental Site Assessment by S.W. Cole dated September 3, 2019.

Topography on the site generally slopes from north to south, towards West Commercial Street and, ultimately, the Fore River. The northern portion of the site is characterized by an approximately 75' embankment with naturally vegetated steep slopes (2H:1V) or greater in most areas. At the toe of the existing slope, the site levels off and has shallow slopes ranging from 1% to 2% from north to south. The distance from the toe of slope to the south property line is approximately 150' in most areas and decreases in both the east and west ends of the site. The flatter portions of the site will be the primary area of development. Runoff emanating from the site generally sheet flows from north to south across the old rail yard towards West Commercial Street, as the grade from east to west stays fairly constant.

West Commercial Street has a vertical sag curve in front of the property that is centered approximately 550'± east of the south-west property corner. The low point in the street is at roughly elevation 15' (NGVD29). An existing catch basin that collects runoff from the road and site is located along the north gutter line in the roadway sag. Water flows to this catch basin from the east at a high point in the road near the south-east property corner and from the west starting at a catch basin located in the gutter line approximately 400'± westerly. Although the grade along the road is 1% to 2%, this amounts to a change in grade of approximately 8'± from the sag curve to the high point at the southeast property corner. The grade across the site is relatively flat from the high point at the southeast corner and stays constant across the site at around elevation 21' to 23' (NGVD29) as the road trends downwards. Therefore, the developable site area is approximately 8'± above the grade at the sag in the road at the maximum. There is no curb along this portion of West Commercial Street, but a grassed slope extends from the edge of pavement up to the flatter area of the site. This change in grade transitions from relatively flat to steep (2:1±) in the area of the catch basin and roadway sag.

The USDA NRCS Medium Intensity Soil Survey identifies the site soils to be comprised of the following:

Table 1 USDA Soils		
Soil Type	Soil Description	Hydrologic Group
Cut and Fill Land	Silt Loam, 3 to 8 percent slopes	N/A
Hinckley	Loamy Sand, 3 to 8 percent slopes	A
Hinckley	Loamy Sand, 15 to 25 percent slopes	A

The majority of the development is located on cut and fill land, which is considered to have low susceptibility to erosion and is somewhat moderately well drained. According to the Environmental Site Assessment investigation and geotechnical investigation² the site consists of uncontrolled fills overlying native deposits of interlayered sandy soils and clay-silt soils, overlying native sands, overlying native sand and gravel. Groundwater was identified at depths of 10 feet below grade to 26 feet below grade, thus it is believed that groundwater will not be a substantive design or construction issue. Construction dewatering is expected to be limited, if needed at all. This is consistent with historical information in which West Commercial Street was created on landfill, including the subject property. The embankment on the north portion of the site is identified as Hinckley which is an "A"

² See Geotechnical Report by Summit Geoengineering Services November 8, 2019.

soil and is excessively draining. A geotechnical investigation was performed by Summit Geoengineering and their findings are consistent with these soils interpretations.

There are three primary points of interest for this analysis:

1. The first is through the existing catch basin located in the gutter line 400' west of the sag curve in West Commercial Street, identified as Point of Interest #1 on the accompanying watershed maps. This catch basin is part of a small closed drainage system that ties into the nearby CSO line that extends down the Hill from Danforth Street, along an extension of Vaughn Street to West Commercial. There is a regulator structure for the Fore River Interceptor and a CSO outfall to the Fore River. It is believed the Catch basin ties into the CSO line and any water from the catch basin flows to the Fore River outfall.
2. The second Point of Interest is the existing catch basin located in the sag curve, identified as POI #2. The background associated with this catch basin is limited based on correspondence and requests for information Gorrill Palmer has exchanged with the City's DPW archivist. Various historical plans suggest that the two catch basins at the West Commercial Street sag may tie into a remnant drainage pipe that extended across what is now the Canal Landing Boat Yard and discharged to the Fore River.³ Further exploration and coordination with DPW is required to better understand these current street conditions.
3. The third point of analysis is at the gutter line along the frontage of the southeast corner of the site, identified as the Point of Interest #3. POI #3 connects to the 48" Fore River Interceptor Sewer, with flows continuing to the wastewater treatment plant or as overflow thru a number of CSO regulator/overflow structures that discharge to the Fore River. Two CSO's are located in the vicinity of the site; these are believed to be CSO 028 at Emery Street and CSO 029 – Commercial Street.⁴

12.2 Proposed Site Conditions

The proposed project design contemplates the existing soils, topography, local ordinances, and other applicable design standards. The VA Clinic development will consist of a 34,155 SF, two-story outpatient facility and a 35,880 SF, multi-level parking structure placed along the southern property line. The site will have three driveways with access to West Commercial Street. The main entrance/patient drop-off will be placed in between the two structures, approximately 370'± west of the southeast property corner. The other two driveways are placed at the west and east ends of the site and provide access for staff and patients/visitors, respectively. The proposed site conditions will include building rooftop, bituminous pavement including both Standard and Heavy-Duty pavement and areas of porous pavement sections, CIP concrete and landscaped areas.

As part of the City of Portland's sidewalk development program, a 10' wide multi-use sidewalk with a 5' grassed esplanade will be constructed in the right of way along the property frontage. This will also include adding vertical granite curb to the roadway. For this analysis, the associated area in the right of way that would not have otherwise been developed for the VA clinic project was not included in the calculations when determining required water quality treatment percentages. This area is defined in the calculation's summaries, as the sidewalk corridor in the West Commercial Street Right

³ See City DPW archives 00652_001_001 Right of Way Track and Map Portland Terminal, June 30, 1916 V-I-D/2-T

⁴ See reports contained in <https://www.portlandmaine.gov/1835/Reports-and-Assessments>

of Way along the property frontage, other than driveways associated with the VA Clinic. It was, however, modeled for flood control purposes, as it will ultimately contribute to the developed peak flow to each point of interest. **Overall, the VA Clinic development will create approximately 3.93 acres of impervious area and 4.73 acres of developed area within the property boundary.** The sidewalk development will create an additional 0.327 acres of impervious area and 0.485 acres of developed area within the West Commercial Street Right of Way.

The site will generally be graded to follow the existing topography, high in the north and draining south towards the three points of analysis along the property frontage in West Commercial Street. As part of the VA Clinic development, the entire flat area up to the embankment, in the center of the site, will be grubbed and cleared. Excavation activity in this area will be subject to requirements set forth in a Site-Specific Environmental Media Management Plan to be prepared by S.W. Cole Engineering. The expected goals and objectives of the plan will be to retain all onsite soils containing ash, onsite. Clean soils (typically found greater than 2 feet below ground surface) may be exported or reused onsite. Ash containing soils will require a cover system consisting of concrete; asphalt or 12" to 24" of clean borrow/topsoil. The embankment to the north will be partially excavated to make way for the north side of the parking garage and an access drive around the garage. This area will require a retaining wall installed in the northeast corner of the site. A short retaining wall will also be installed on the back of the 10' sidewalk in order to overcome the grade difference between the site and West Commercial Street. The site is graded to have elevations similar to, or just above, existing grade to blend with the site topography and access grades at each of the driveways.

The porous pavement surface parking for 150 parking spaces will be located on the western portion of the property. An access drive/fire lane will be installed that will navigate through the rear of the site and connect the west and east entrances for emergency vehicles, delivery vehicles and other larger vehicles that need to access the rear of the buildings. The main entrance will consist of separated entry and exit lanes. There will be a 14' wide entrance lane and two 11' wide exit lanes for right and left turning exiting movements. The entrance will transition into a roundabout whereupon entering vehicles may enter the parking structure, or continue around to drop-off/pick-up patients. The main entrance will have access to the rear access drive but only for emergency vehicles and for snow removal. Pedestrian access will be provided to the proposed pathway sidewalk in the front of the property on both sides of the VA Clinic and from the parking structure. Seating areas have been provided around the main entrance and staff entrance to the VA Clinic as well.

Stormwater on the site will be collected by utilizing sheet flow and collected flow from catch basins and piped roof drains. The majority of the surface parking area on the west end will benefit from the use of porous asphalt pavement. The porous pavement system consists of porous asphalt placed over a multi-layer section of various aggregates for runoff storage and a filtering course all underlain by a collection layer. We are proposing an unlined system to allow some amount of runoff infiltration below since the existing site soils are very granular in nature and the groundwater is relatively deep across the site. This pavement section will contribute to both water quality treatment and quantity collection and control of stormwater runoff from the parking lot. An underground sand filter system with proprietary below grade storage will also be provided behind the buildings for the treatment and storage of runoff from the building roofs. A closed drainage system will collect runoff from the site and connect into a proposed stormdrain in West Commercial Street to be constructed by the City of Portland. The proposed stormdrain will collect runoff from the site, the existing sag catch basins, and the existing westerly set of catch basins. The proposed stormdrain will connect to the

existing CSO overflow adjacent to the westerly end of the site which will convey the runoff to the Fore River. The proposed City stormdrain will be constructed to alleviate the existing ponding conditions at West Commercial Street during larger storms. A shallow swale will be graded on the toe of the northern embankment to collect runoff from the area to the north and redirect it around the site as the development footprint will interrupt this flow path. As a result of the proposed City stormdrain conveying runoff from the site and West Commercial Street directly to the Fore River, the points of interest in the Post-development condition have been reduced to two points. POI 3 will remain the same as in the Predevelopment condition. POI 1 and 2 have been combined into one point, moved to the Fore River and designated as POI 1. **In accordance with the Chapter 500 Stormwater Management Law Section 4.F.3.a, a waiver from the flooding standard due to direct discharge to the Fore River is requested for the tributary area to post-development POI 1.**

12.3 **References**

The following reference sources were reviewed during preparation of the stormwater analysis:

1. Hydraulic Engineering Circular No. 22, Second Edition – Urban Drainage Design Manual, U.S. Department of Transportation, August 2001.
2. AASHTO Model Drainage Manual, American Association of State Highway and Transportation, 1991.
3. Hydraulic Engineering Circular No. 14 - Hydraulic Design of Energy Dissipators for Culverts and Channel, U.S. Department of Transportation, September 1983.
4. Maine Erosion and Sedimentation Control Handbook for Construction: Best Management Practices, MaineDEP, current edition.
5. Best Management Practices for Erosion and Sediment Control, U.S. Department of Transportation, June 1995.
6. Municipal Stormwater Management – Second Edition, Thomas N. Debo, Andrew J. Reese, 2003.
7. Handbook of Applied Hydrology, Chow, 1964.
8. Technical Release Number 55 – Urban Hydrology for Small Watersheds, USDA Soil Conservation Service, June 1986.
9. Stormwater Management for Maine, Volume III BMPS Technical Design Manual, MeDEP, January 2006.
10. Technical Release Number 20 – Computer Program for Project Formulation – Hydrology, USDA Soil Conservation Service, May 1983.
11. Section 4 – Hydrology, USDA Soil Conservation Service, March 1985.
12. Technical Release Number 55 – Urban Hydrology for Small Watersheds, USDA Soil Conservation Service, June 1986.

The following sources were used for preparation of the VA Clinic stormwater quality analysis:

1. Stormwater Management for Maine, Volume III BMPS Technical Design Manual, MaineDEP, May 2016

2. A Current Assessment of Urban Best Management Practices, Techniques for Reducing Non-point Source Pollution in the Coastal Zone, U.S.E.P.A. Office of Watersheds, March 1992.
3. MeDEP Chapter 500, Stormwater Management Rules.

Computer programs used to assist in the various components of this analysis include:

1. HydroCAD 10.00, HydroCAD Software Solutions LLC – used for modeling watersheds for pre and post development conditions.
2. Microsoft Excel, Microsoft Corporation – used for spreadsheet computations.
3. AutoCAD Civil 3D 2019, Autodesk - used to determine areas and graphical representation of design.

Data resources used to obtain the hydrologic input data for the stormwater models are identified later in this report.

12.4 **Overview of Stormwater Runoff Modeling**

The stormwater analysis evaluates the following elements:

- Pre-development and post-development stormwater runoff and peak discharge rates;
- The impacts of the VA Clinic development and subsequent modification to site discharge rates and locations;
- The effect of land cover modifications within the VA Clinic, including some that are expected to increase site runoff rates;
- The requirements for stormwater management including compliance with Chapter 500 flooding standards;
- Storm drainage requirements for parking areas, roof areas and other improvements; and
- Requirements for water quality measures.

12.5 **Methods of Analysis**

12.5.1. Stormwater Quantity

The hydrologic analyses for predevelopment and post development conditions have been conducted based upon the methodology contained in the USDA Soil Conservation Service's Technical Releases No. 20 and 55 (SCS TR-20 and TR-55) as modified for special site conditions. For this section of Cumberland County, Maine, a 24-hour SCS Type III storm distribution was used for the analysis using the following storm frequencies and rainfall amounts:

Table 2	
Storm Event	24-Hour Rainfall
2-Year Storm	3.10
10-Year Storm	4.60
25-Year Storm	5.80

The HydroCAD computer program was used in the analysis. This program determines the critical points of the project watershed and uses SCS TR-20 methodology for evaluation of the anticipated conditions at these points.

Land use, cover, delineation of watershed sub-catchments, hydraulic flow paths, and hydrologic soil types were obtained using the following data:

1. Portland West, Maine USGS 7.5-minute Quadrangle Maps.
2. Cumberland County, USDA Medium Intensity Soils Survey.
3. Onsite Topographic Survey with 1-foot contour intervals prepared by Titcomb Associates, January 2016.
4. Boundary Survey by Titcomb Associates, November 2019.
5. The Class C Medium Intensity Soil Survey for the watershed areas.

12.5.2. Stormwater Quality

Water quality treatment for the development has been designed to meet the Stormwater Management Rules (Chapter 500) General Standard, which requires the treatment of at least 95% of impervious area and at least 80% of developed area generated.

12.6 Description of Site Watershed Models

The watershed models were developed to predict peak discharge rates at the points of analysis for the pre and post development conditions.

12.7 Predevelopment Conditions

The predevelopment conditions for this analysis were considered to be the original condition of the site as described in the Existing Site Conditions section above. We note that the historic use of the property, for perhaps at least a century or more, was as a rail siding with various sets of tracks and developed land area. Our analysis has not specifically accounted for those long-ago land uses on the site, including any levels of imperviousness attributable to the rail yard, including rail ties, yard area or other consolidated/packed surfaces. Point of analysis #3 ultimately connects to the Fore River Interceptor sewer pipe which normally drains to the wastewater treatment plant. During rainfall events, the catch basins at Points of interest #1 and #2 are believed to discharge to the Fore River via the combined sewer overflow to the west and a separate outfall, respectively. Figure WV-1 depicts the three predevelopment watersheds and their corresponding hydrologic characteristics. It was determined in the medium intensity soil survey that the site contains cut and fill material⁵ which does not have a designated hydrologic soil group. For this analysis, the area of the site that was found to contain cut and fill material was chosen to be associated with soil group B.

Table 12-1 below summarizes the predevelopment hydrologic characteristics for each subarea.

⁵ Indicative of the site's historic rail yard land use that involved manmade fill land and grading to accommodate multiple sets of tracks.

Table 12-1 Predevelopment Watersheds Hydrologic Characteristics			
Watershed #	Area(ac)	CN	Hydrologic Time Of Concentration
1S – Area in West of Property	2.590	58	12.9
2S – Area in Center of Property	15.868	57	17.8
3S – Area in East of Property	0.396	63	5.9
Total	18.854		

Points of Interest (POI) #1 and #2 are both catch basins in West Commercial Street. POI #1 is approximately 400' west and upgradient from POI #2 but they are separate closed systems according to the records we have obtained from the City records. POI #3 is a point in the gutter line in front of the southeast property corner that flows east to an existing catch basin in front of the Portland Star Match Building. The Predevelopment HydroCAD model calculates flow at each of the points of interest.

In recent storm events⁶, ponding has been observed above the catch basins at POI#1 and #2, mostly likely due to the following:

- High rainfall (>2")
- High tide conditions
- Recent temporary snow pile and construction conditions on the south side of the street within the Canal Landing site
- Inadequate capacity within the outfall pipe from the CB's at POI#2. As this pipe condition is not fully known and identified, we are uncertain as to the capacity.

12.8 Post-development Conditions

In the developed condition, the VA Clinic will create 3.93 acres of new impervious area (including porous and regular pavement, concrete, and rooftop) and 4.73 acres of new overall developed area. Runoff from the development drains to two primary systems:

- The majority of the onsite developed area will be captured through a new closed collection and pipe network consisting of several stormwater BMP's around the entire site. This system will connect to the proposed City stormdrain system in West Commercial Street. The new West Commercial Stormdrain System will help alleviate the existing flooding in the section of West Commercial Street adjacent to the site and will convey the street and site stormwater runoff directly to the Fore River.
- A portion of the east driveway entrance and sidewalk will drain toward West Commercial Street and continue east along the gutter line into the existing catch basin downgradient of POI #3. There will be a reduction in the site's contributing area to POI#3 and thus less runoff reaching that POI.

⁶ Peak rain event on December 14, 2019.

Due to the size, length, and elevation constraints of the site, it was determined that traditional, centralized stormwater management approaches would not be ideal. Instead, several stormwater BMP's have been designed that will treat different portions of the site. These BMP's are utilized in order to provide proper treatment and storage. By providing BMP's throughout the site, overall time of concentrations for the subcatchments are small and have been modelled as direct entry in the Post-Development HydroCAD model.

Test pits and borings were taken in October 2019. The geotechnical report performed by Summit Geoengineering Services has been included in Section 11, Attachment F of this Application.

Figure W-2 depicts the post-development watershed conditions and the corresponding hydraulic properties. The following is a listing of the watersheds associated with the proposed development.

Table 12-2			
Post-development Subcatchments Hydrologic Characteristics			
Subcatchment #	Area(ac)	CN	Hydrologic Time Of Concentration
1S – West Area	3.98	55	12.9
2S-A – Embankment	9.211	55	16.4
2S-B – West Driveway	0.249	86	5.0
2S-C – West Parking	1.367	94	5.0
2S-D – Loading Dock	0.033	98	5.0
2S-E – Rooftop & East Side	2.466	95	5.0
2S-F – Frontage/ROW	1.396	90	12.3
3S – East Area	0.152	84	5.0
Total	18.854		

The design includes specific onsite measures for the retention of stormwater runoff attributable to the development. These include an underground storage system behind the proposed buildings that will serve to store and treat roof runoff and a smaller percentage of yard areas. The proposed parking lot will also consist of a porous asphalt pavement section that will contain a 12" layer of clean crushed stone. Based on a 40% void ratio in the stone, its storage capacity is approximately 4.8" of runoff. These storage volumes have been accounted for in the accompanying post-development analysis.

The following table reflects the pre- and post-development peak rates of runoff at the points of interest:

Table 12-3				
Comparison of Peak Discharge Rates at Points of Interest				
Pre-Development to Post-Development				
Storm Event & Condition	Pre POI #1 (cfs)	Pre POI #2 (cfs)	Post POI #1 (cfs)	POI #3 (cfs)
2-Yr Predevelopment	0.30	0.92		0.15
2-Yr Post Development			5.05	0.29
Change in 2-Yr Peak Discharge Rate				+0.14

Table 12-3 Comparison of Peak Discharge Rates at Points of Interest Pre-Development to Post-Development				
Storm Event & Condition	Pre POI #1 (cfs)	Pre POI #2 (cfs)	Post POI #1 (cfs)	POI #3 (cfs)
10-Yr Predevelopment	1.71	6.82		0.53
10-Yr Post Development			15.97	0.52
Change in 10-Yr Peak Discharge Rate				-0.01
25-Yr Predevelopment	3.37	14.79		0.90
25-Yr Post Development			25.28	0.71
Change in 25-Yr Peak Discharge Rate				-0.19

Note: Pre POI #1 and Post POI #1 are not at the same location and therefore are not directly comparable.

In order to properly model the post-development condition, the sidewalk development in the right of way was included in the HydroCAD model. This also increases the amount of runoff that reaches all the Points of Interest. Subcatchment 2S contains the largest portion of the sidewalk development; totaling approximately 18,120 SF of developed area. The area of Subcatchment 3S decreased to 0.152 acres from 0.396 acres due to the development of the east entrance which is being captured and treated in Subcatchment 2S-E. Although Subcatchment 3S decreases in total area from the pre- to post-developed condition and peak discharges decrease in the 10- and 25-yr storm events, the peak flow insignificantly increases in the 2-yr event. Without the additional sidewalk area that drains to POI #3, the post-developed 2-yr peak discharge would be less than the pre-developed condition. Alternatives were evaluated to attempt to capture, treat, and store the runoff generated by the sidewalk. This was found to be unfeasible due to the lack of space in the right of way and the presence of several utilities located in the right of way currently that would conflict with any stormwater management BMP's. Most importantly, this includes an underground 115KVA power transmission line. **It is believed by Gorrill Palmer that the 0.14 cfs increase in the peak flow for the 2-year storm at POI 3 is insignificant.**

There is no direct comparison between the peak flows at POI 1 and POI 2 in the pre and post development condition. Due to the proposed construction of a new stormdrain within West Commercial Street that conveys runoff directly to the Fore River, **a waiver from the flooding standard, in accordance with the Chapter 500 Stormwater Management Law Section 4.F.3.a, due to direct discharge to the Fore River is requested for the tributary area to post-development POI 1.** The proposed treatment bmp's onsite provide some attenuation of the peak post-development runoff. The onsite stormdrain system from the bmp outlet pipes as well as the proposed City stormdrain system within West Commercial Street has been analyzed using the Autodesk Storm and Sanitary Analysis program. The system has been analyzed for the 25-year storm event. The program analyzes the pipe system and provides hydraulic grade line information based upon flow to the system utilizing the Rational Method. The peak 25-year outlet flows from the bmp's as calculated with HydroCAD have been used as direct inflow at the applicable drainage structure.

The stormdrain analysis is included in Attachment E.

12.9 Stormwater Management Summary

Under the General Standards, the project is required to meet the BMP Standards, as the development site is not tributary to a lake watershed. The project contains new construction that will also be required to meet the treatment standards of Chapter 500. The following sections summarize the BMP's that are being employed to meet the water quantity and quality standards for the proposed development.

12.9.1. Porous Pavement

Underdrained porous asphalt pavement will be installed in all of the parking spaces on the west side of the VA Clinic building and a portion of the drive aisles. Direct absorption or sheet flow from adjacent areas will flow down through the porous pavement and through a sand filter section before being collected in underdrain pipes that will connect to the closed collection system that ultimately connects to the proposed City stormdrain. The porous pavement filter section was designed in accordance with Section 7.7 of the BMPS Technical Design Manual dated May 2016. We propose to not place a liner under the system, thus allowing some amount of infiltration into the native soils below, principally as these soils are granular in nature, the groundwater depth is greater than 5' below the bottom of the system and there are no specific groundwater resource concerns as the site is so proximate to the Fore River and tidal (saltwater) conditions.

In the HydroCAD model, the porous pavement filter is labeled as Pond 2P – Porous Pavement. The porous pavement filter area is oversized for the tributary area draining to it and exceeds the standard for 20% of the contributing area running onto it. It should be noted that the stone storage section will also be constructed underneath the heavy-duty pavement section for ease of construction and continuity in the drainage section. This, along with the oversized filter area, provides a water quality volume that treats more than the first two inches of runoff which in turn controls additional flow for flood control purposes. The reservoir layer contains 4" overflow pipes that will connect to a storm drain collection line on the south side of the parking lot. An orifice will control the release of stormwater from the porous pavement area such that the area will drain dry between 24-48hrs.

In total, the porous pavement will provide treatment for 1.22 acres of impervious area and 1.367 acres of developed area. Design calculations for the porous pavement filter are included in Attachment C.

12.9.2. Subsurface Sand Filter

A subsurface sand filter with R-Tank® storage above will be installed underneath the rear access drive. It will treat water from both building rooftops, and impervious and landscaped area in the main entrance and rear access drive. Roof drain leaders will pipe directly into the system from the buildings. Additional runoff will sheet flow into catch basins that will discharge into the system. Initial stormwater flows will enter the pretreatment rows of the system. From there it will flow into the rest of the reservoir layer that is sized for the water quality volume. Stormwater will then flow vertically through a sand filter section before being collected in underdrain pipes that connect to the closed conveyance system that

ultimately drains to the proposed City stormdrain. The subsurface sand filter section was designed in accordance with Section 7.3 of the BMP's Technical Design Manual dated May 2016 and the DEP approval letter for the R-Tank dated January 11, 2019.⁷

In the Post-developed HydroCAD model, this BMP is labeled as Pond 4P - Subsurface Sand Filter. This specific configuration of subsurface sand filter uses a MaineDEP approved R-Tank® storage system above the sand filter, rather than below. The storage volume provided is equal to the water quality volume, which is the volume associated with 1" of rain contributing from impervious areas and 0.4" of rain from landscaped areas. Outlet control structures at each end of the system will allow water to flow into the pretreatment rows in the system first. The structures at the inlet to the system will also have weirs set at the defined water quality volume elevation, so that excess flow bypasses the system and flows to the closed conveyance system. An orifice will control the release of stormwater from the subsurface sand filter area such that the area will drain dry between 24-48 hrs.

In total, the subsurface sand filter will provide treatment for 2.272 acres of impervious area and 2.466 acres of developed area. Design calculations for the subsurface sand filter are included in Attachment C.

12.9.3. FocalPoint® Modular Biofiltration System

A FocalPoint® system⁸ will be employed to provide quality treatment for a small portion of the west driveway entrance and landscaped area. The system consists of a shallow (6-12") depression filled with 18" of a soil filter media and planted with a variety of grasses and shrubs. Runoff entering the cell is detained temporarily before passing through the filter media. The filter media has a high flow rate (100 in/hr) that allows high amounts of runoff to be handled in a smaller footprint. The stormwater is then controlled below the filter section with a chamber storage system before being released downstream to a treatment row. An underdrain pipe then collects and discharges the stormwater from the system and connects to the site's closed conveyance system that discharges to the proposed City stormdrain. An overflow standpipe with a beehive grate is set approximately 6" above the filter bed and captures stormwater that cannot be handled in larger storm events.

The FocalPoint® will provide treatment for 0.168 acres of impervious area and 0.081 acres of developed area. Design calculations for the FocalPoint® Bio-filtration system are provided in Attachment D of this Application.

12.10 Water Quality Summary

The construction of BMP's employed as part of the development will help to treat the stormwater generated from the development as much as practically possible. The porous pavement, subsurface sand filter, and FocalPoint® successfully treat approximately 3.66 acres of impervious area and 4.05 acres of developed area. This equates to overall treatment percentages of 93.08% and 85.63% for impervious and developed area, respectively. Table 12-4, below, demonstrates the treated impervious and developed areas by percentage for each BMP employed:

⁷ See letter from Mark Bergeron to ACF Environmental, January 11, 2019 available at <https://www.maine.gov/dep/land/stormwater/stormwaterbmps/manufactured-systems/R-Tank%20approval%20letter.pdf>

⁸ See <https://www.maine.gov/dep/land/stormwater/stormwaterbmps/manufactured-systems/focalpoint-january2017.pdf>

	Table 12-4 Treatment Percentage by BMP			
	Porous Pavement	Subsurface Sand Filter	FocalPoint	Total
Impervious	31.02%	57.78%	4.27%	93.08%
Developed	28.88%	51.48%	5.27%	85.63%

It was realized that, due to the site being raised above West Commercial Street, approximately 0.234 acres of the driveways and other impervious area along the property frontage would not be treatable due to the slopes and presence of utilities in the right of way. Similarly, the proposed loading dock truck well is not treated by the aforementioned BMP's. These impervious areas represent approximately 5.92% of the total impervious area and, therefore, the overall treatment percentage for impervious areas fall slightly below the 95% treatment standard. The overall developed area treatment is 85.63% which exceeds the required developed area treatment standard of 80%.

In an effort to increase the overall treatment of the impervious areas, two additional measures have been considered. The first is a catch basin filter cartridge⁹ insert that would be installed in the loading dock catch basin which will treat an additional 1,445 SF. Treating the area tributary to the loading dock increases the overall impervious treatment percentage to 93.93%. The second measure to improve overall impervious area treatment was the increase in water quality volume provided in the porous pavement section. In order to offset the small amount of impervious area not treated to meet the standard of 95%, the porous pavement section will contain a water quality volume that will provide storage to treat 2" of runoff from the impervious area and 0.8" of runoff from the landscaped area. By treating twice the amount required for an area approximately 1.55 acres in area, it is our opinion that this will provide satisfactory treatment of the stormwater runoff that is generated by the VA Clinic Development. **The proposal to increase the runoff treatment depth is consistent with Chapter 500, Part 4.C (2) (a) (ii).**

Water Quality Calculations that demonstrate the compliance with Chapter 500 for the VA Clinic development are provided in Attachment C. A summary of the calculations is provided below:

VA Clinic Treatment Summary

Total Impervious Area =	3.93 acres
Total Developed Area =	4.73 acres
Impervious Area Treated =	3.69 acres
Percent Impervious Area Treated =	93.93%*
Developed Area Treated =	4.08 acres
Percent Developed Area Treated =	86.33%

*(Standard met by increasing treatment depth in the Porous Asphalt zones and employing a catch basin filter cartridge in the loading dock truck well)

12.11 Maintenance of Facilities

The stormwater management facilities will be maintained by the Applicant or their assigns after construction is completed. The general contractor will be responsible for maintenance during

⁹ Filter cartridge by Fabco Industries Inc. – www.fabco-industries.com

construction. The contract documents will require that the contractor designate a person for maintenance of the facilities during construction as required by this application. Long-term operation/maintenance schedules for the facilities are provided in the O&M Manual included in Attachment G to this report.

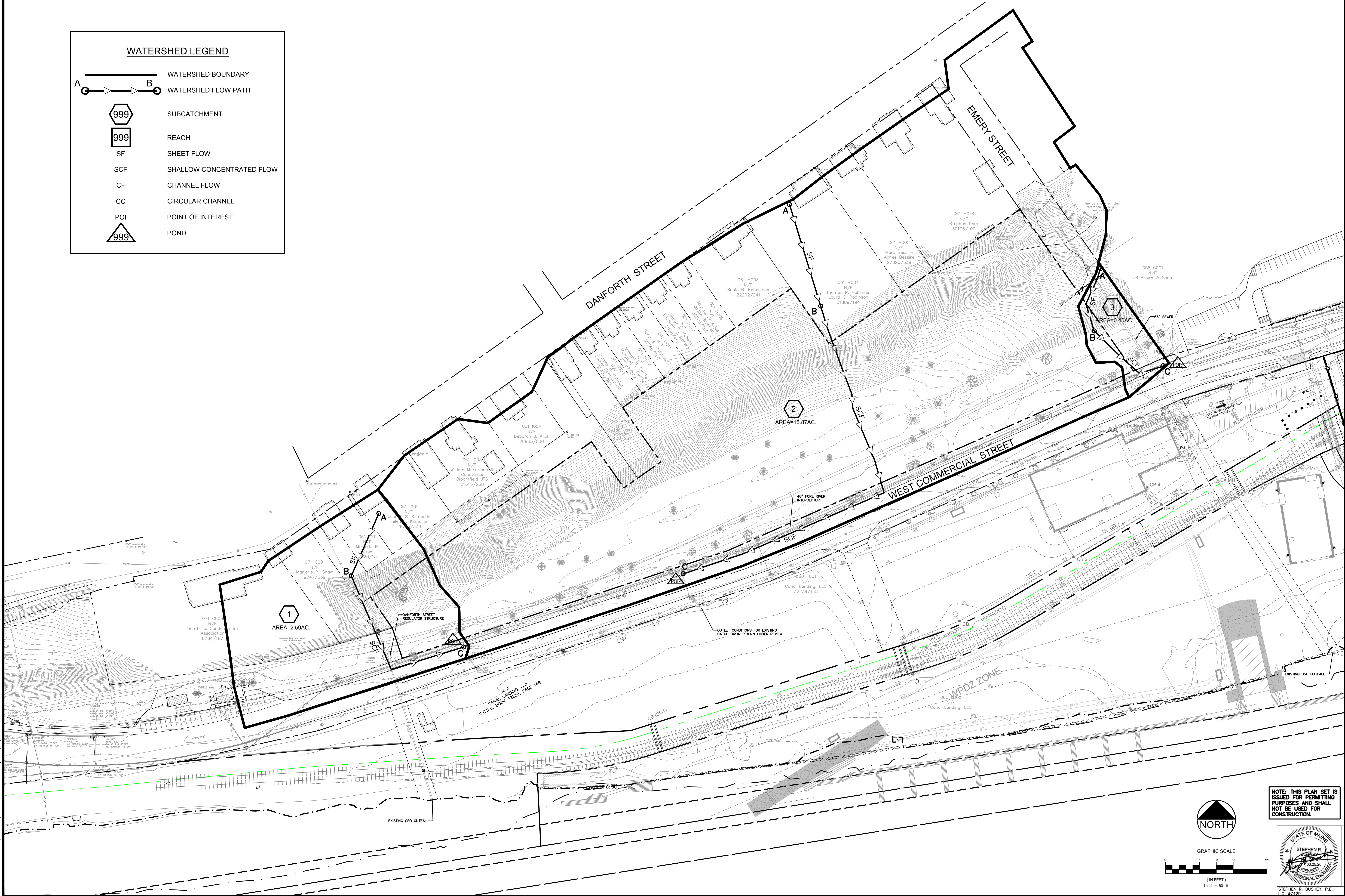
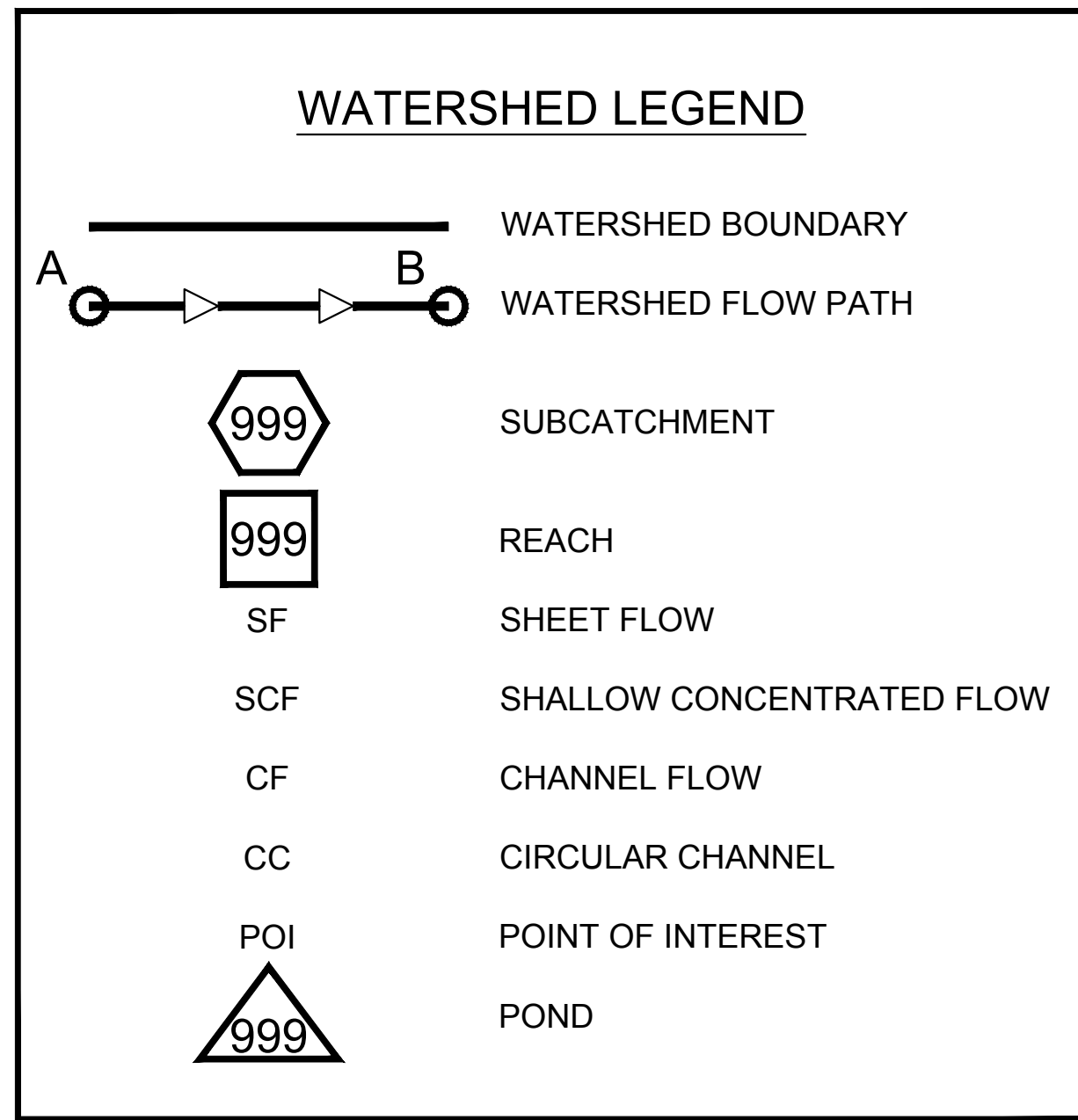
12.12 Conclusion

The Stormwater Management Plan for this project outlines the measures proposed to achieve compliance with the Chapter 500 Stormwater Management standards for water quality treatment. The design includes stormwater quantity controls including storage components within the porous pavement cross section and within the roof drainage sand filter system. The site will discharge to a municipal system that outflows to the Fore River which is major river segment that is under tidal influence, thus the applicant is seeking a waiver of the flooding standards. The majority of the proposed development will be tributary to one closed storm drain system with one point of discharge. A minor amount of development area will direct runoff to one other discharge location within the municipal street system and these impacts are considered insignificant.

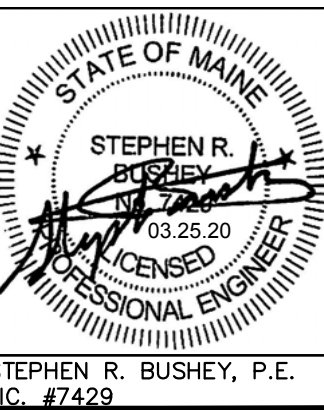
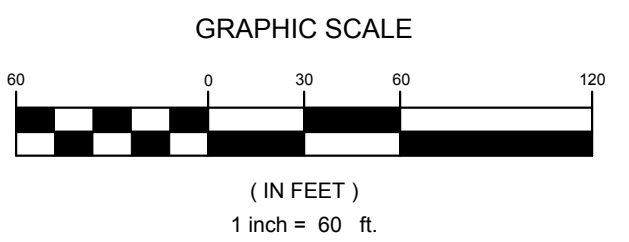
Based on the proposed design, the runoff from the proposed development will be captured and conveyed in a manner that will not have an adverse impact to the surrounding stormwater systems or the environment.

WATERSHED MAPS

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CONSTRUCTION.



Rev.	Date	Revision
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

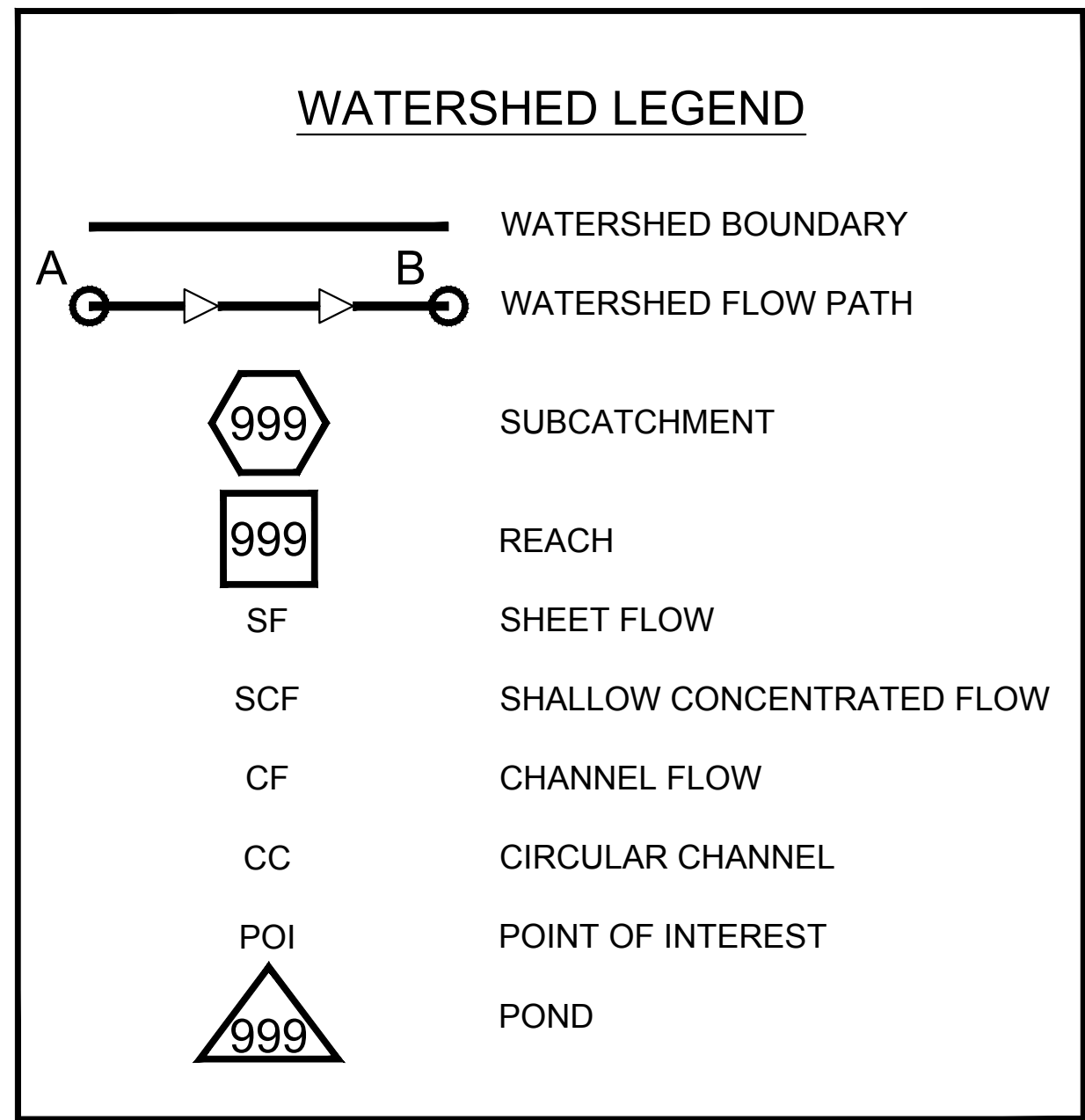
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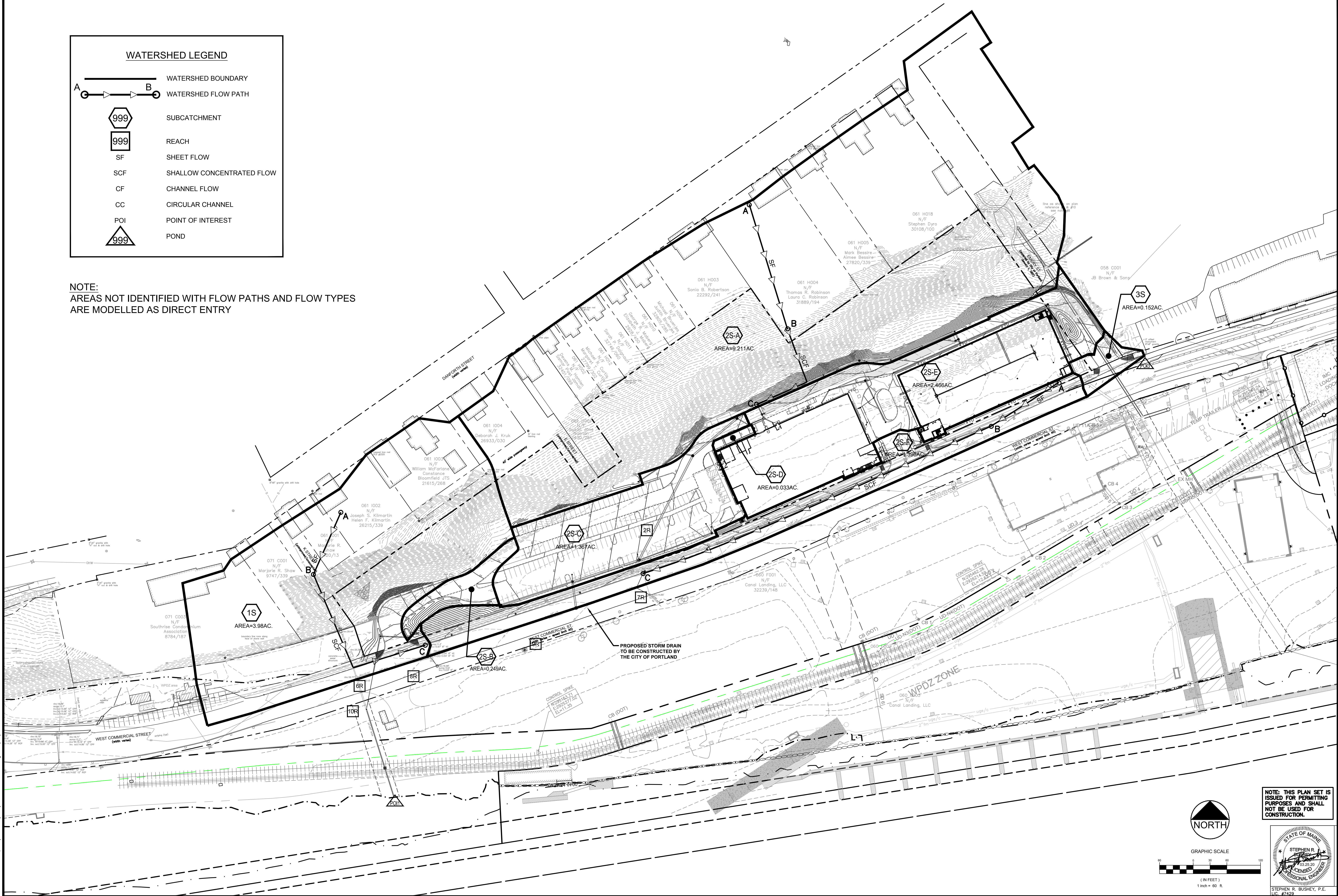
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Drawing Name:	PRE-DEVELOPMENT WATERSHED PLAN
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 153 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	W-1
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NOTE:
AREAS NOT IDENTIFIED WITH FLOW PATHS AND FLOW TYPES
ARE MODELLED AS DIRECT ENTRY



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Rev.	Date	Revision
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RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
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Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	W-2
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NOT BE USED FOR
CONSTRUCTION.

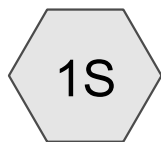
STATE OF MAINE
STEPHEN R. BUSHEY, P.E.
LICENSED PROFESSIONAL ENGINEER
LIC. #7269

NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.

ATTACHMENT A

Predevelopment Runoff Calculations



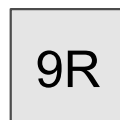
Area 1



POI 1



Area 2



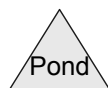
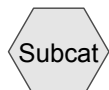
POI 2



Area 3



POI 3



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1

Runoff Area=2.590 ac 16.18% Impervious Runoff Depth>0.23"
Flow Length=440' Tc=12.9 min UI Adjusted CN=57 Runoff=0.30 cfs 0.051 af

Subcatchment2S: Area 2

Runoff Area=15.868 ac 15.61% Impervious Runoff Depth>0.16"
Flow Length=890' Tc=17.8 min UI Adjusted CN=54 Runoff=0.92 cfs 0.212 af

Subcatchment3S: Area 3

Runoff Area=0.396 ac 6.31% Impervious Runoff Depth>0.42"
Flow Length=250' Tc=5.9 min CN=63 Runoff=0.15 cfs 0.014 af

Reach 8R: POI 1

Inflow=0.30 cfs 0.051 af
Outflow=0.30 cfs 0.051 af

Reach 9R: POI 2

Inflow=0.92 cfs 0.212 af
Outflow=0.92 cfs 0.212 af

Reach 10R: POI 3

Inflow=0.15 cfs 0.014 af
Outflow=0.15 cfs 0.014 af

Total Runoff Area = 18.854 ac Runoff Volume = 0.277 af Average Runoff Depth = 0.18"
84.51% Pervious = 15.933 ac 15.49% Impervious = 2.921 ac

Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1

Runoff Area=2.590 ac 16.18% Impervious Runoff Depth>0.80"
Flow Length=440' Tc=12.9 min UI Adjusted CN=57 Runoff=1.71 cfs 0.172 af

Subcatchment2S: Area 2

Runoff Area=15.868 ac 15.61% Impervious Runoff Depth>0.64"
Flow Length=890' Tc=17.8 min UI Adjusted CN=54 Runoff=6.82 cfs 0.850 af

Subcatchment3S: Area 3

Runoff Area=0.396 ac 6.31% Impervious Runoff Depth>1.14"
Flow Length=250' Tc=5.9 min CN=63 Runoff=0.53 cfs 0.038 af

Reach 8R: POI 1

Inflow=1.71 cfs 0.172 af
Outflow=1.71 cfs 0.172 af

Reach 9R: POI 2

Inflow=6.82 cfs 0.850 af
Outflow=6.82 cfs 0.850 af

Reach 10R: POI 3

Inflow=0.53 cfs 0.038 af
Outflow=0.53 cfs 0.038 af

Total Runoff Area = 18.854 ac Runoff Volume = 1.060 af Average Runoff Depth = 0.67"
84.51% Pervious = 15.933 ac 15.49% Impervious = 2.921 ac

Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1

Runoff Area=2.590 ac 16.18% Impervious Runoff Depth>1.40"
Flow Length=440' Tc=12.9 min UI Adjusted CN=57 Runoff=3.37 cfs 0.303 af

Subcatchment2S: Area 2

Runoff Area=15.868 ac 15.61% Impervious Runoff Depth>1.19"
Flow Length=890' Tc=17.8 min UI Adjusted CN=54 Runoff=14.79 cfs 1.569 af

Subcatchment3S: Area 3

Runoff Area=0.396 ac 6.31% Impervious Runoff Depth>1.87"
Flow Length=250' Tc=5.9 min CN=63 Runoff=0.90 cfs 0.062 af

Reach 8R: POI 1

Inflow=3.37 cfs 0.303 af
Outflow=3.37 cfs 0.303 af

Reach 9R: POI 2

Inflow=14.79 cfs 1.569 af
Outflow=14.79 cfs 1.569 af

Reach 10R: POI 3

Inflow=0.90 cfs 0.062 af
Outflow=0.90 cfs 0.062 af

Total Runoff Area = 18.854 ac Runoff Volume = 1.933 af Average Runoff Depth = 1.23"
84.51% Pervious = 15.933 ac 15.49% Impervious = 2.921 ac

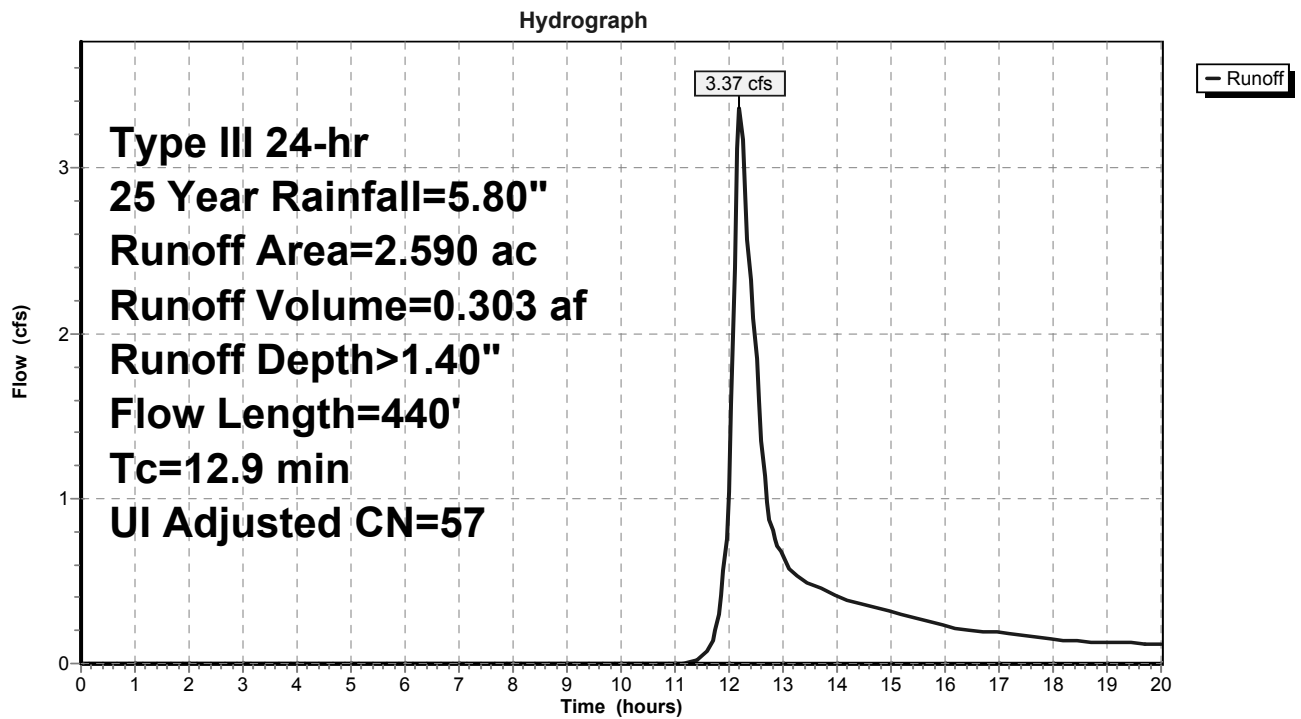
Summary for Subcatchment 1S: Area 1

Runoff = 3.37 cfs @ 12.20 hrs, Volume= 0.303 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.512	69		50-75% Grass cover, Fair, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.171			83.82% Pervious Area
0.419			16.18% Impervious Area
0.142			33.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Subcatchment 1S: Area 1

Summary for Subcatchment 2S: Area 2

Runoff = 14.79 cfs @ 12.29 hrs, Volume= 1.569 af, Depth> 1.19"

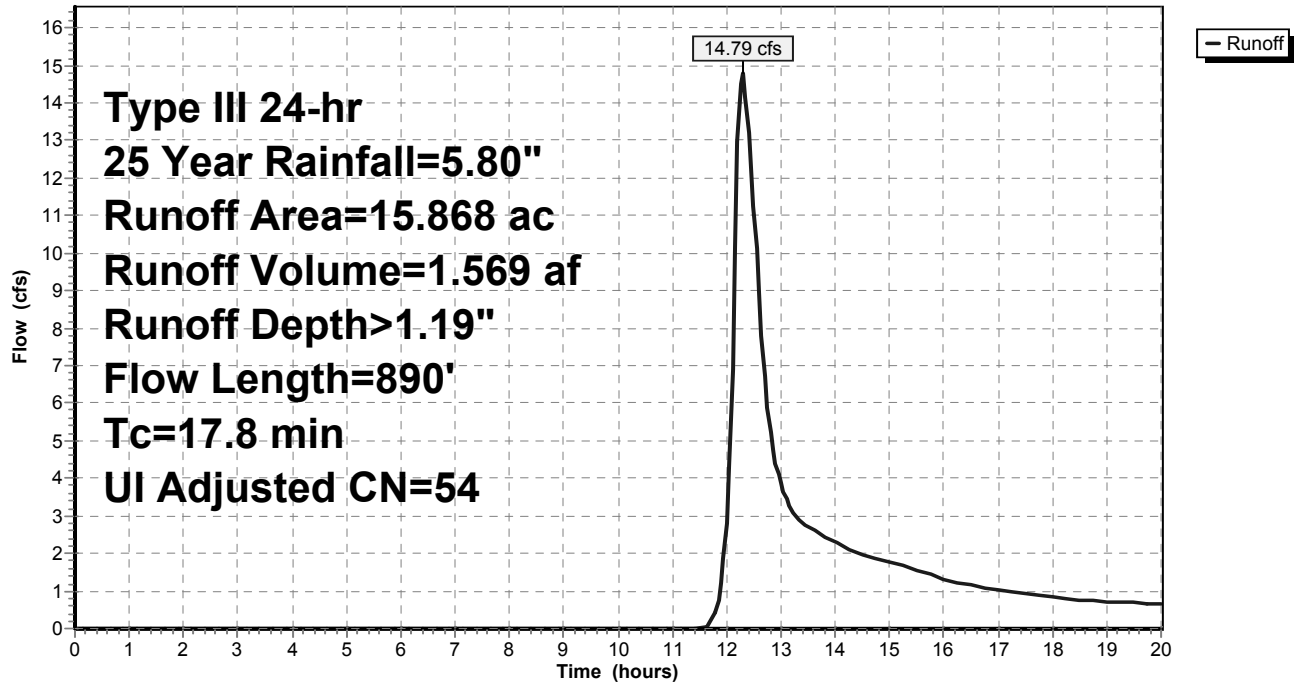
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
6.111	43		Woods/grass comb., Fair, HSG A
0.963	98		Paved roads w/curbs & sewers, HSG B
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
2.565	56		Brush, Fair, HSG B
1.015	69		50-75% Grass cover, Fair, HSG B
15.868	57	54	Weighted Average, UI Adjusted
13.391			84.39% Pervious Area
2.477			15.61% Impervious Area
1.514			61.12% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
2.9	150	0.0150	0.86		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
2.1	360	0.0200	2.87		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
17.8	890	Total			

Subcatchment 2S: Area 2

Hydrograph



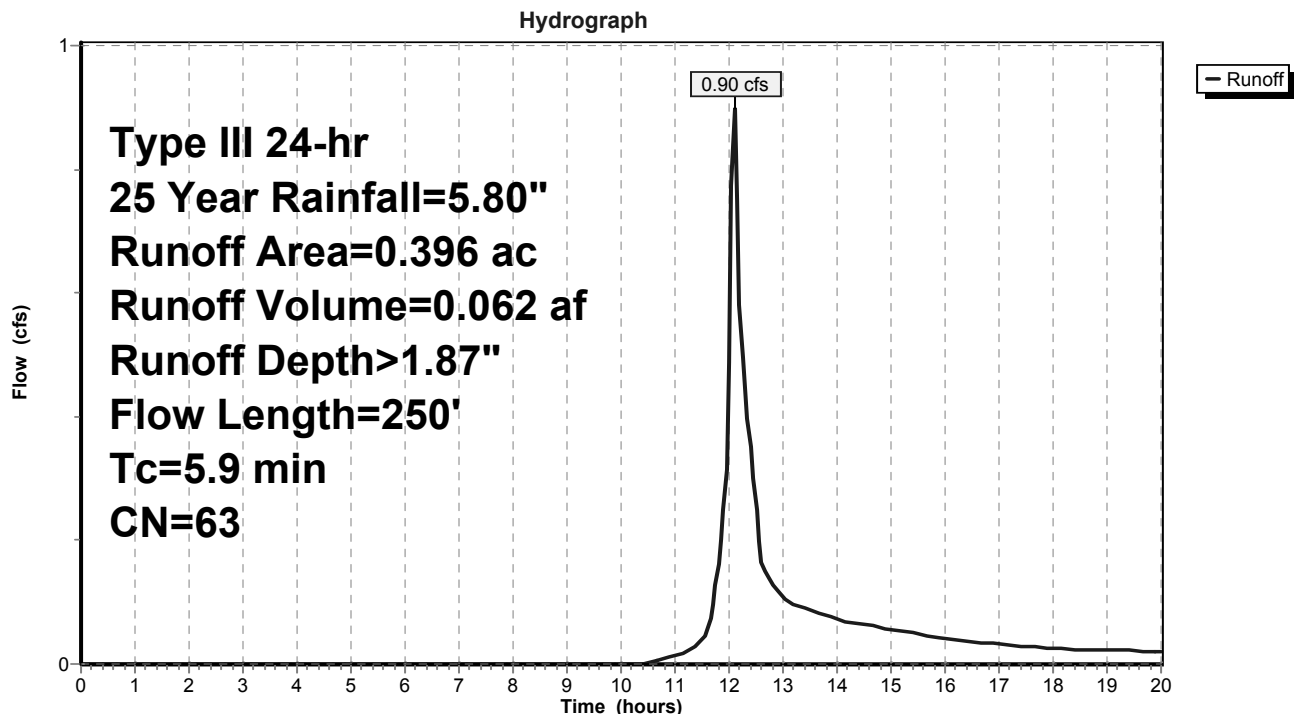
Summary for Subcatchment 3S: Area 3

Runoff = 0.90 cfs @ 12.10 hrs, Volume= 0.062 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.174	65	Woods/grass comb., Fair, HSG B
0.025	98	Paved roads w/curbs & sewers, HSG B
0.171	56	Brush, Fair, HSG B
0.026	69	50-75% Grass cover, Fair, HSG B
0.396	63	Weighted Average
0.371		93.69% Pervious Area
0.025		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Wooded Embankment Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	150	0.0300	1.21		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
5.9	250	Total			

Subcatchment 3S: Area 3

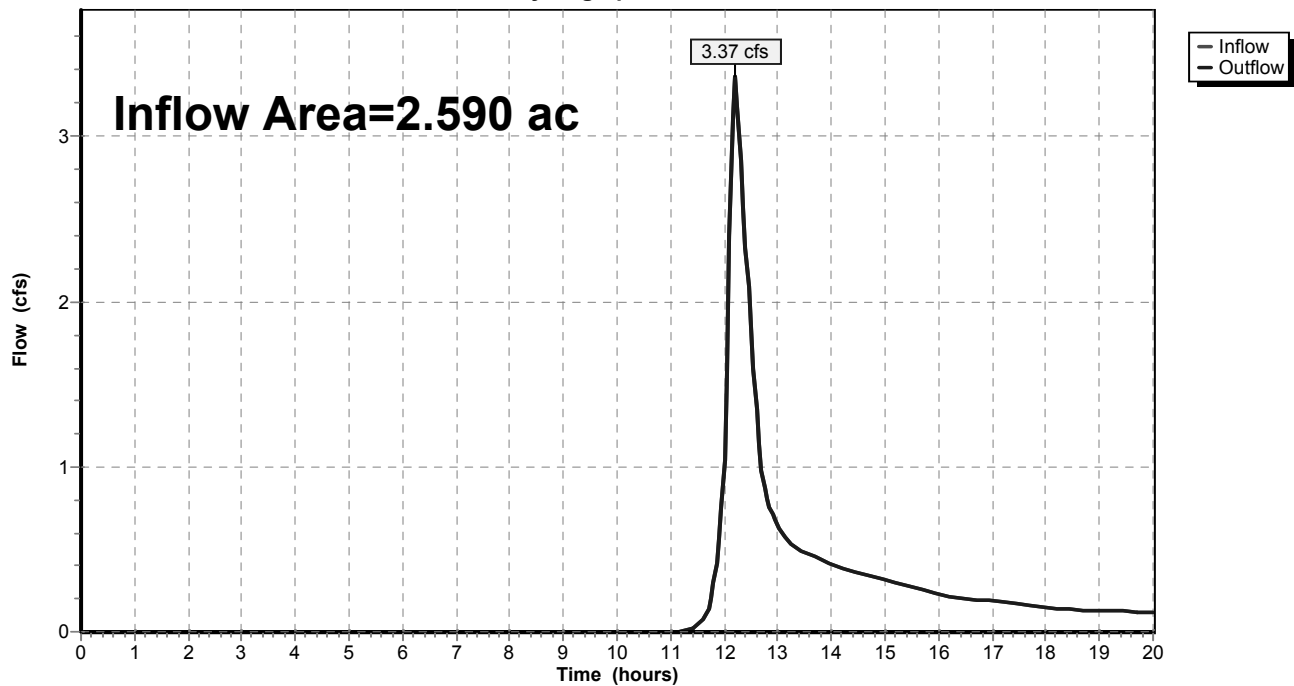
Summary for Reach 8R: POI 1

Inflow Area = 2.590 ac, 16.18% Impervious, Inflow Depth > 1.40" for 25 Year event
Inflow = 3.37 cfs @ 12.20 hrs, Volume= 0.303 af
Outflow = 3.37 cfs @ 12.20 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 8R: POI 1

Hydrograph



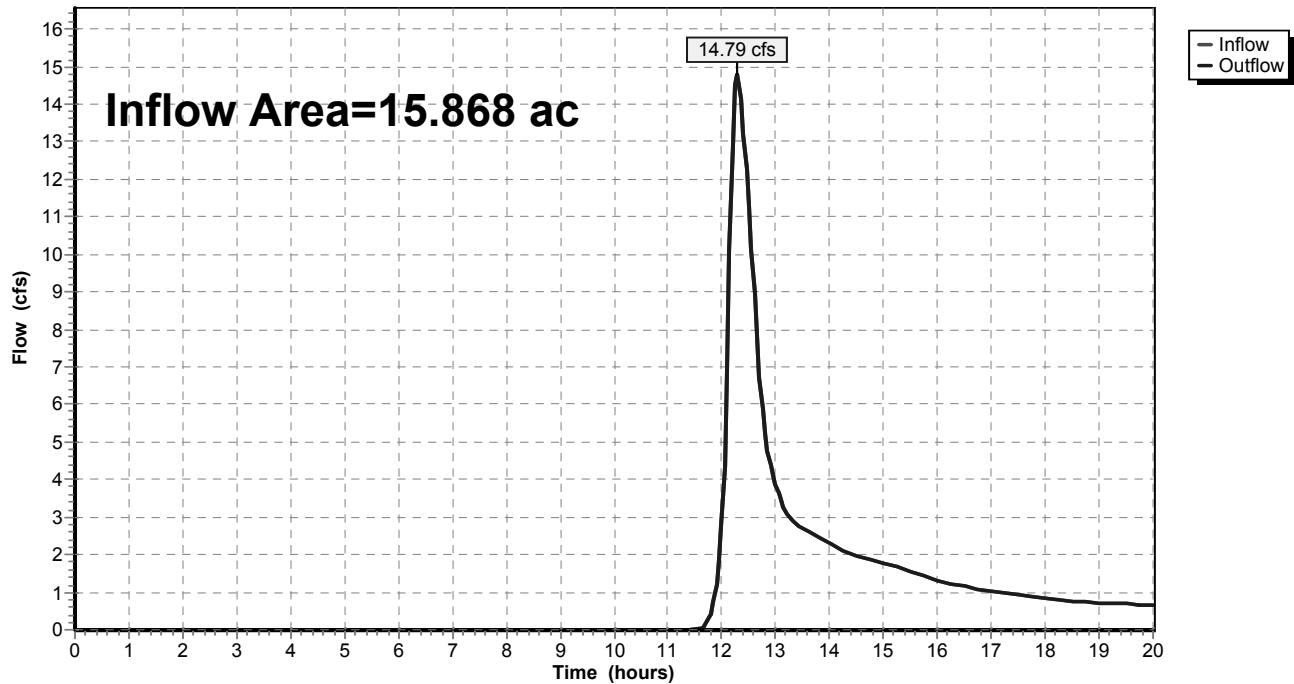
Summary for Reach 9R: POI 2

Inflow Area = 15.868 ac, 15.61% Impervious, Inflow Depth > 1.19" for 25 Year event
Inflow = 14.79 cfs @ 12.29 hrs, Volume= 1.569 af
Outflow = 14.79 cfs @ 12.29 hrs, Volume= 1.569 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 9R: POI 2

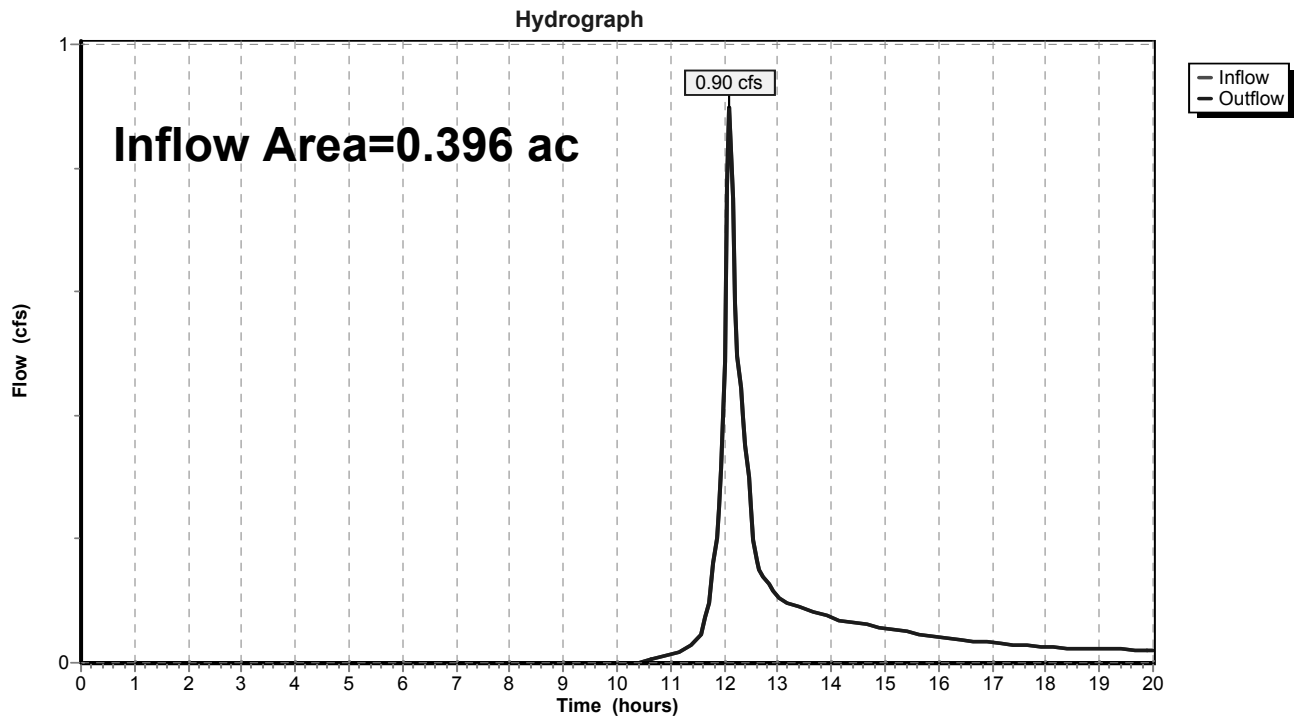
Hydrograph



Summary for Reach 10R: POI 3

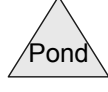
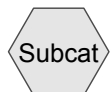
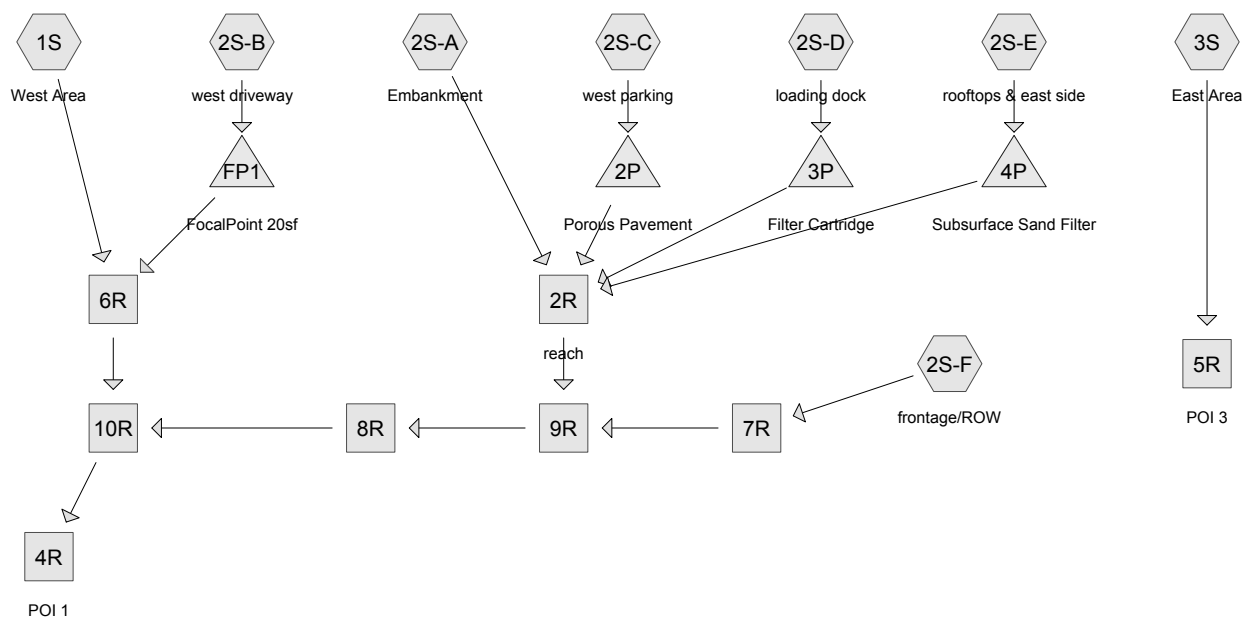
Inflow Area = 0.396 ac, 6.31% Impervious, Inflow Depth > 1.87" for 25 Year event
Inflow = 0.90 cfs @ 12.10 hrs, Volume= 0.062 af
Outflow = 0.90 cfs @ 12.10 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 10R: POI 3

ATTACHMENT B

Postdevelopment Runoff Calculations



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: West Area	Runoff Area=3.980 ac 14.77% Impervious Runoff Depth>0.14" Flow Length=440' Tc=12.9 min UI Adjusted CN=53 Runoff=0.19 cfs 0.046 af
Subcatchment2S-A: Embankment	Runoff Area=9.211 ac 16.37% Impervious Runoff Depth>0.10" Flow Length=530' Tc=16.4 min UI Adjusted CN=51 Runoff=0.20 cfs 0.077 af
Subcatchment2S-B: west driveway	Runoff Area=0.249 ac 67.47% Impervious Runoff Depth>1.63" Tc=6.0 min CN=86 Runoff=0.50 cfs 0.034 af
Subcatchment2S-C: west parking	Runoff Area=1.367 ac 89.25% Impervious Runoff Depth>2.32" Tc=5.0 min CN=94 Runoff=3.79 cfs 0.264 af
Subcatchment2S-D: loading dock	Runoff Area=0.033 ac 100.00% Impervious Runoff Depth>2.73" Tc=5.0 min CN=98 Runoff=0.10 cfs 0.008 af
Subcatchment2S-E: rooftops & east side	Runoff Area=2.466 ac 92.13% Impervious Runoff Depth>2.41" Tc=5.0 min CN=95 Runoff=7.02 cfs 0.496 af
Subcatchment2S-F: frontage/ROW	Runoff Area=1.396 ac 77.79% Impervious Runoff Depth>1.95" Flow Length=825' Slope=0.0200 '/' Tc=12.3 min CN=90 Runoff=2.73 cfs 0.227 af
Subcatchment3S: East Area	Runoff Area=0.152 ac 61.18% Impervious Runoff Depth>1.49" Tc=5.0 min CN=84 Runoff=0.29 cfs 0.019 af
Reach 2R: reach	Avg. Flow Depth=0.53' Max Vel=3.83 fps Inflow=3.42 cfs 0.424 af 30.0" Round Pipe n=0.011 L=374.0' S=0.0037 '/' Capacity=29.66 cfs Outflow=2.49 cfs 0.422 af
Reach 4R: POI 1	Inflow=5.05 cfs 0.727 af Outflow=5.05 cfs 0.727 af
Reach 5R: POI 3	Inflow=0.29 cfs 0.019 af Outflow=0.29 cfs 0.019 af
Reach 6R:	Avg. Flow Depth=0.20' Max Vel=3.63 fps Inflow=0.49 cfs 0.080 af 18.0" Round Pipe n=0.011 L=85.0' S=0.0118 '/' Capacity=13.47 cfs Outflow=0.49 cfs 0.080 af
Reach 7R:	Avg. Flow Depth=0.57' Max Vel=4.36 fps Inflow=2.73 cfs 0.227 af 18.0" Round Pipe n=0.011 L=100.0' S=0.0050 '/' Capacity=8.78 cfs Outflow=2.69 cfs 0.226 af
Reach 8R:	Avg. Flow Depth=0.67' Max Vel=4.57 fps Inflow=4.89 cfs 0.648 af 30.0" Round Pipe n=0.011 L=154.0' S=0.0040 '/' Capacity=30.76 cfs Outflow=4.77 cfs 0.647 af
Reach 9R:	Avg. Flow Depth=0.74' Max Vel=4.15 fps Inflow=5.07 cfs 0.649 af 30.0" Round Pipe n=0.011 L=223.0' S=0.0030 '/' Capacity=26.57 cfs Outflow=4.89 cfs 0.648 af
Reach 10R:	Avg. Flow Depth=0.65' Max Vel=4.98 fps Inflow=5.07 cfs 0.727 af 30.0" Round Pipe n=0.011 L=32.0' S=0.0050 '/' Capacity=34.28 cfs Outflow=5.05 cfs 0.727 af

3572_post-dev_3-20-20

Prepared by Gorrill Palmer

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Type III 24-hr 2 Year Rainfall=3.10"

Printed 3/20/2020

Page 2

Pond 2P: Porous PavementPeak Elev=20.36' Storage=7,888 cf Inflow=3.79 cfs 0.264 af
Outflow=0.09 cfs 0.088 af**Pond 3P: Filter Cartridge**Inflow=0.10 cfs 0.008 af
Primary=0.10 cfs 0.008 af**Pond 4P: Subsurface Sand Filter**Peak Elev=18.94' Storage=0.204 af Inflow=7.02 cfs 0.496 af
Outflow=3.27 cfs 0.252 af**Pond FP1: FocalPoint 20sf**Peak Elev=18.68' Storage=53 cf Inflow=0.50 cfs 0.034 af
Primary=0.08 cfs 0.024 af Secondary=0.41 cfs 0.010 af Outflow=0.49 cfs 0.034 af**Total Runoff Area = 18.854 ac Runoff Volume = 1.171 af Average Runoff Depth = 0.75"**
63.04% Pervious = 11.886 ac 36.96% Impervious = 6.968 ac

Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: West Area Runoff Area=3.980 ac 14.77% Impervious Runoff Depth>0.60"
 Flow Length=440' Tc=12.9 min UI Adjusted CN=53 Runoff=1.67 cfs 0.198 af

Subcatchment2S-A: Embankment Runoff Area=9.211 ac 16.37% Impervious Runoff Depth>0.50"
 Flow Length=530' Tc=16.4 min UI Adjusted CN=51 Runoff=2.76 cfs 0.387 af

Subcatchment2S-B: west driveway Runoff Area=0.249 ac 67.47% Impervious Runoff Depth>2.91"
 Tc=6.0 min CN=86 Runoff=0.88 cfs 0.060 af

Subcatchment2S-C: west parking Runoff Area=1.367 ac 89.25% Impervious Runoff Depth>3.72"
 Tc=5.0 min CN=94 Runoff=5.90 cfs 0.423 af

Subcatchment2S-D: loading dock Runoff Area=0.033 ac 100.00% Impervious Runoff Depth>4.16"
 Tc=5.0 min CN=98 Runoff=0.15 cfs 0.011 af

Subcatchment2S-E: rooftops & east side Runoff Area=2.466 ac 92.13% Impervious Runoff Depth>3.82"
 Tc=5.0 min CN=95 Runoff=10.81 cfs 0.786 af

Subcatchment2S-F: frontage/ROW Runoff Area=1.396 ac 77.79% Impervious Runoff Depth>3.29"
 Flow Length=825' Slope=0.0200 '/' Tc=12.3 min CN=90 Runoff=4.50 cfs 0.383 af

Subcatchment3S: East Area Runoff Area=0.152 ac 61.18% Impervious Runoff Depth>2.73"
 Tc=5.0 min CN=84 Runoff=0.52 cfs 0.035 af

Reach 2R: reach Avg. Flow Depth=1.04' Max Vel=5.55 fps Inflow=10.68 cfs 1.121 af
 30.0" Round Pipe n=0.011 L=374.0' S=0.0037 '/' Capacity=29.66 cfs Outflow=10.30 cfs 1.118 af

Reach 4R: POI 1 Inflow=15.97 cfs 1.756 af
 Outflow=15.97 cfs 1.756 af

Reach 5R: POI 3 Inflow=0.52 cfs 0.035 af
 Outflow=0.52 cfs 0.035 af

Reach 6R: Avg. Flow Depth=0.41' Max Vel=5.58 fps Inflow=2.16 cfs 0.258 af
 18.0" Round Pipe n=0.011 L=85.0' S=0.0118 '/' Capacity=13.47 cfs Outflow=2.15 cfs 0.258 af

Reach 7R: Avg. Flow Depth=0.76' Max Vel=4.98 fps Inflow=4.50 cfs 0.383 af
 18.0" Round Pipe n=0.011 L=100.0' S=0.0050 '/' Capacity=8.78 cfs Outflow=4.44 cfs 0.383 af

Reach 8R: Avg. Flow Depth=1.19' Max Vel=6.12 fps Inflow=14.07 cfs 1.499 af
 30.0" Round Pipe n=0.011 L=154.0' S=0.0040 '/' Capacity=30.76 cfs Outflow=13.93 cfs 1.498 af

Reach 9R: Avg. Flow Depth=1.30' Max Vel=5.51 fps Inflow=14.22 cfs 1.501 af
 30.0" Round Pipe n=0.011 L=223.0' S=0.0030 '/' Capacity=26.57 cfs Outflow=14.07 cfs 1.499 af

Reach 10R: Avg. Flow Depth=1.20' Max Vel=6.83 fps Inflow=16.00 cfs 1.756 af
 30.0" Round Pipe n=0.011 L=32.0' S=0.0050 '/' Capacity=34.28 cfs Outflow=15.97 cfs 1.756 af

3572_post-dev_3-20-20*Type III 24-hr 10 Year Rainfall=4.60"*

Prepared by Gorrill Palmer

Printed 3/20/2020

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Page 4

Pond 2P: Porous PavementPeak Elev=20.60' Storage=12,267 cf Inflow=5.90 cfs 0.423 af
Outflow=0.24 cfs 0.169 af**Pond 3P: Filter Cartridge**Inflow=0.15 cfs 0.011 af
Primary=0.15 cfs 0.011 af**Pond 4P: Subsurface Sand Filter**Peak Elev=19.54' Storage=0.204 af Inflow=10.81 cfs 0.786 af
Outflow=10.19 cfs 0.554 af**Pond FP1: FocalPoint 20sf**Peak Elev=18.74' Storage=61 cf Inflow=0.88 cfs 0.060 af
Primary=0.08 cfs 0.037 af Secondary=0.78 cfs 0.023 af Outflow=0.86 cfs 0.060 af**Total Runoff Area = 18.854 ac Runoff Volume = 2.283 af Average Runoff Depth = 1.45"**
63.04% Pervious = 11.886 ac 36.96% Impervious = 6.968 ac

Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: West Area	Runoff Area=3.980 ac 14.77% Impervious Runoff Depth>1.12" Flow Length=440' Tc=12.9 min UI Adjusted CN=53 Runoff=3.87 cfs 0.372 af
Subcatchment2S-A: Embankment	Runoff Area=9.211 ac 16.37% Impervious Runoff Depth>0.99" Flow Length=530' Tc=16.4 min UI Adjusted CN=51 Runoff=6.85 cfs 0.757 af
Subcatchment2S-B: west driveway	Runoff Area=0.249 ac 67.47% Impervious Runoff Depth>3.98" Tc=6.0 min CN=86 Runoff=1.18 cfs 0.083 af
Subcatchment2S-C: west parking	Runoff Area=1.367 ac 89.25% Impervious Runoff Depth>4.85" Tc=5.0 min CN=94 Runoff=7.57 cfs 0.552 af
Subcatchment2S-D: loading dock	Runoff Area=0.033 ac 100.00% Impervious Runoff Depth>5.31" Tc=5.0 min CN=98 Runoff=0.19 cfs 0.015 af
Subcatchment2S-E: rooftops & east side	Runoff Area=2.466 ac 92.13% Impervious Runoff Depth>4.96" Tc=5.0 min CN=95 Runoff=13.80 cfs 1.020 af
Subcatchment2S-F: frontage/ROW	Runoff Area=1.396 ac 77.79% Impervious Runoff Depth>4.40" Flow Length=825' Slope=0.0200 '/' Tc=12.3 min CN=90 Runoff=5.91 cfs 0.511 af
Subcatchment3S: East Area	Runoff Area=0.152 ac 61.18% Impervious Runoff Depth>3.77" Tc=5.0 min CN=84 Runoff=0.71 cfs 0.048 af
Reach 2R: reach	Avg. Flow Depth=1.33' Max Vel=6.19 fps Inflow=16.34 cfs 1.858 af 30.0" Round Pipe n=0.011 L=374.0' S=0.0037 '/' Capacity=29.66 cfs Outflow=15.93 cfs 1.855 af
Reach 4R: POI 1	Inflow=25.28 cfs 2.816 af Outflow=25.28 cfs 2.816 af
Reach 5R: POI 3	Inflow=0.71 cfs 0.048 af Outflow=0.71 cfs 0.048 af
Reach 6R:	Avg. Flow Depth=0.60' Max Vel=6.89 fps Inflow=4.58 cfs 0.455 af 18.0" Round Pipe n=0.011 L=85.0' S=0.0118 '/' Capacity=13.47 cfs Outflow=4.57 cfs 0.454 af
Reach 7R:	Avg. Flow Depth=0.90' Max Vel=5.32 fps Inflow=5.91 cfs 0.511 af 18.0" Round Pipe n=0.011 L=100.0' S=0.0050 '/' Capacity=8.78 cfs Outflow=5.86 cfs 0.511 af
Reach 8R:	Avg. Flow Depth=1.52' Max Vel=6.74 fps Inflow=21.13 cfs 2.363 af 30.0" Round Pipe n=0.011 L=154.0' S=0.0040 '/' Capacity=30.76 cfs Outflow=20.97 cfs 2.362 af
Reach 9R:	Avg. Flow Depth=1.70' Max Vel=6.02 fps Inflow=21.27 cfs 2.366 af 30.0" Round Pipe n=0.011 L=223.0' S=0.0030 '/' Capacity=26.57 cfs Outflow=21.13 cfs 2.363 af
Reach 10R:	Avg. Flow Depth=1.60' Max Vel=7.63 fps Inflow=25.30 cfs 2.816 af 30.0" Round Pipe n=0.011 L=32.0' S=0.0050 '/' Capacity=34.28 cfs Outflow=25.28 cfs 2.816 af

3572_post-dev_3-20-20*Type III 24-hr 25 Year Rainfall=5.80"*

Prepared by Gorrill Palmer

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Page 3

Pond 2P: Porous PavementPeak Elev=20.74' Storage=14,721 cf Inflow=7.57 cfs 0.552 af
Outflow=0.51 cfs 0.282 af**Pond 3P: Filter Cartridge**Inflow=0.19 cfs 0.015 af
Primary=0.19 cfs 0.015 af**Pond 4P: Subsurface Sand Filter**Peak Elev=20.11' Storage=0.205 af Inflow=13.80 cfs 1.020 af
Outflow=13.64 cfs 0.804 af**Pond FP1: FocalPoint 20sf**Peak Elev=18.78' Storage=66 cf Inflow=1.18 cfs 0.083 af
Primary=0.08 cfs 0.047 af Secondary=1.08 cfs 0.036 af Outflow=1.16 cfs 0.083 af**Total Runoff Area = 18.854 ac Runoff Volume = 3.358 af Average Runoff Depth = 2.14"**
63.04% Pervious = 11.886 ac 36.96% Impervious = 6.968 ac

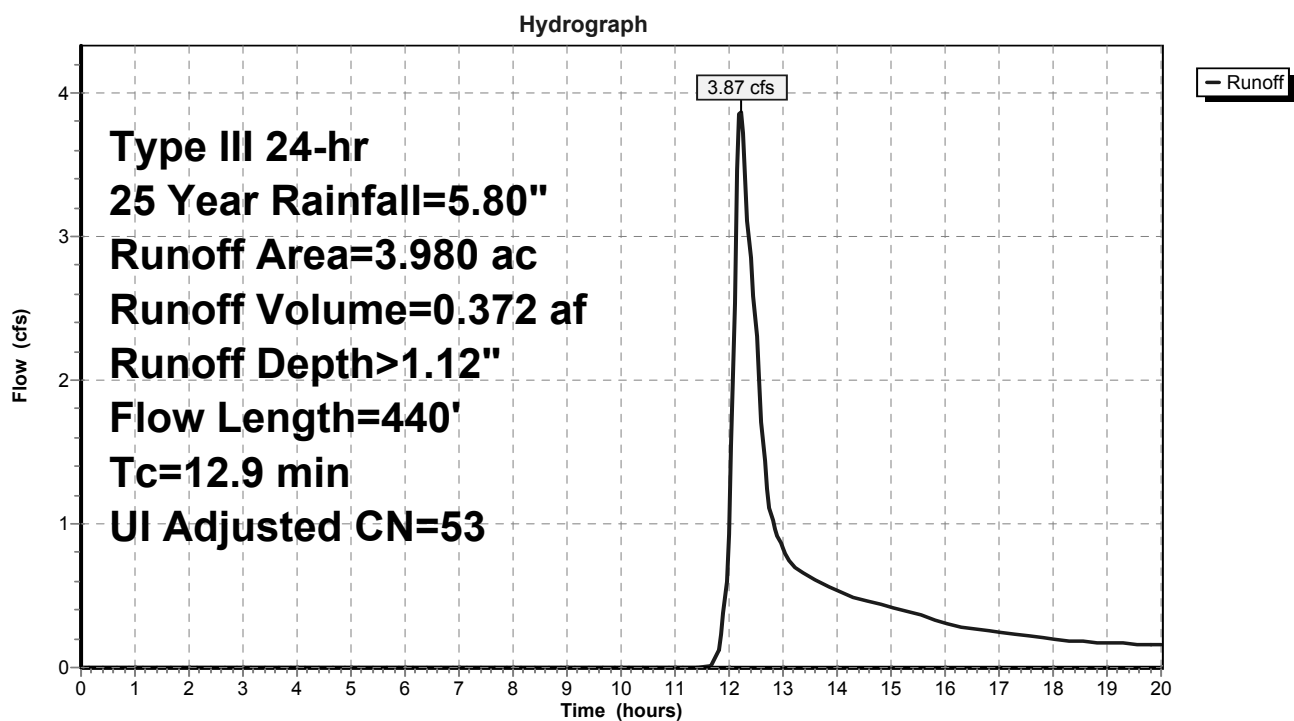
Summary for Subcatchment 1S: West Area

Runoff = 3.87 cfs @ 12.21 hrs, Volume= 0.372 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
2.470	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.282	98		Unconnected roofs, HSG B
0.483	69		50-75% Grass cover, Fair, HSG B
0.029	98		Paved parking, HSG B
3.980	55	53	Weighted Average, UI Adjusted
3.392			85.23% Pervious Area
0.588			14.77% Impervious Area
0.282			47.96% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Subcatchment 1S: West Area

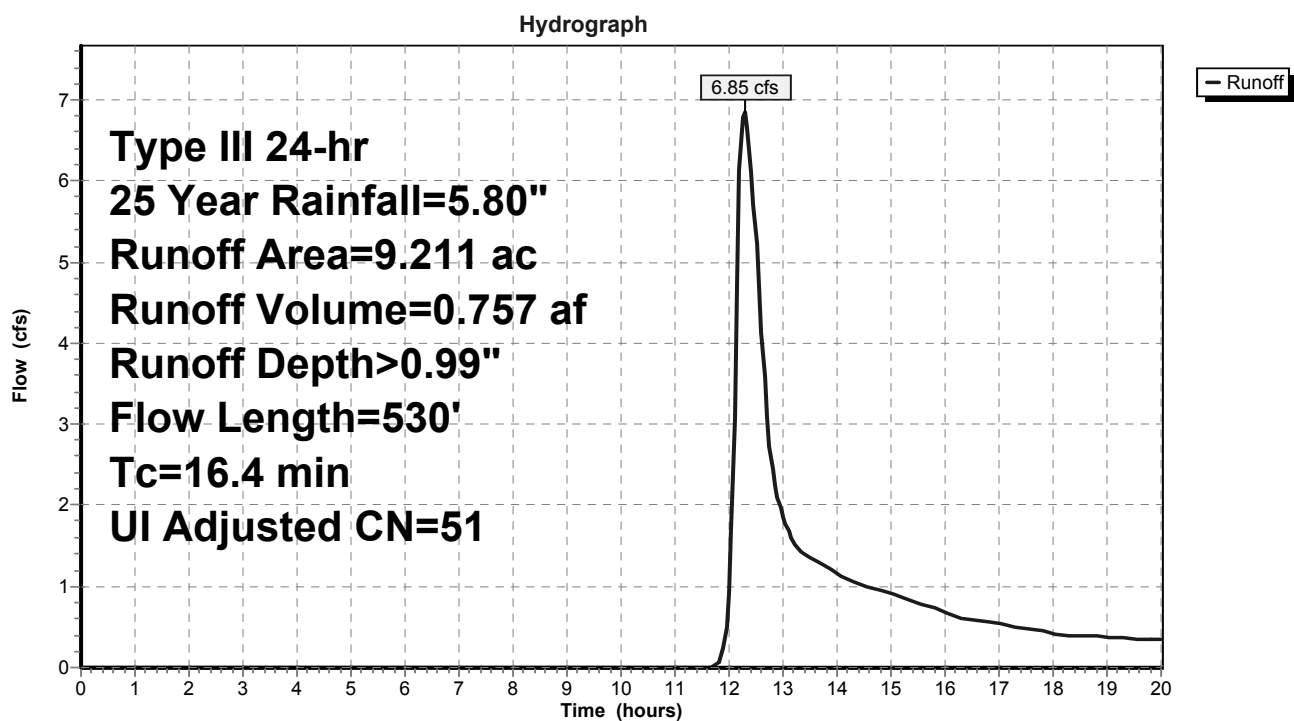
Summary for Subcatchment 2S-A: Embankment

Runoff = 6.85 cfs @ 12.28 hrs, Volume= 0.757 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
3.821	43		Woods/grass comb., Fair, HSG A
3.700	49		50-75% Grass cover, Fair, HSG A
1.500	98		Unconnected roofs, HSG B
0.182	61		>75% Grass cover, Good, HSG B
0.008	98		Unconnected pavement, HSG B
9.211	55	51	Weighted Average, UI Adjusted
7.703			83.63% Pervious Area
1.508			16.37% Impervious Area
1.508			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.4	530	Total			

Subcatchment 2S-A: Embankment

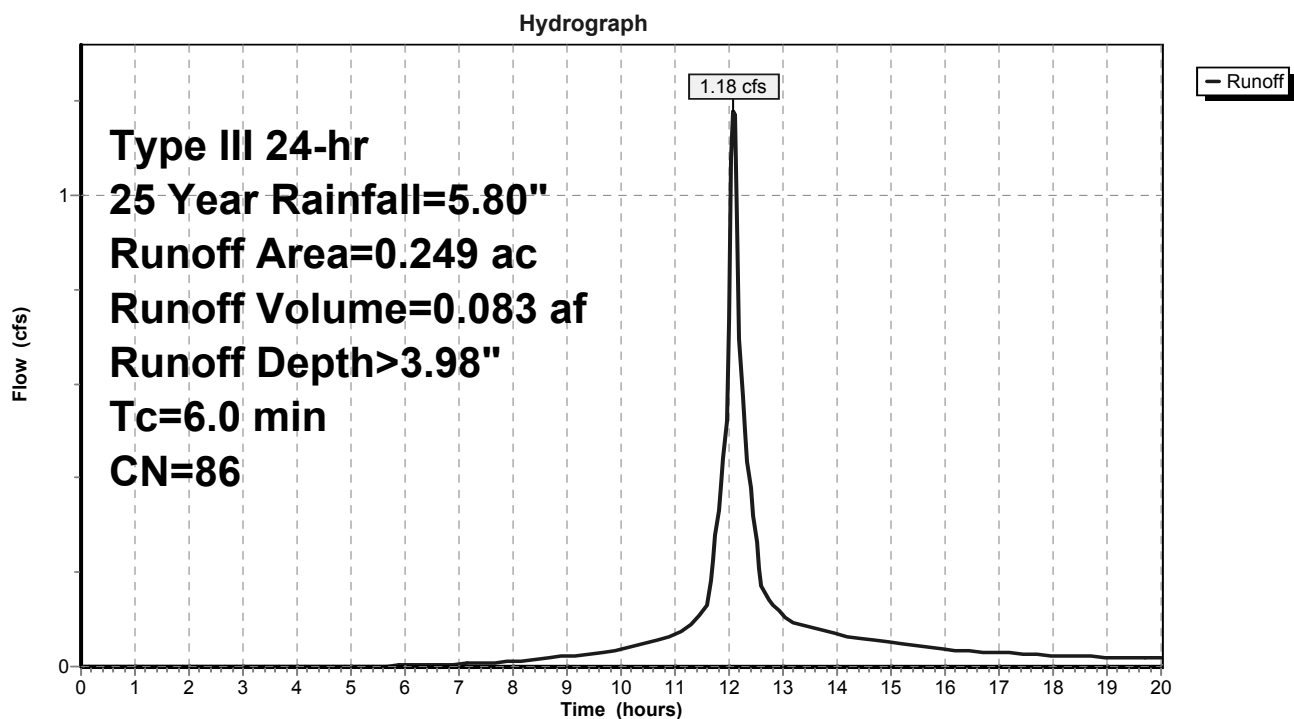
Summary for Subcatchment 2S-B: west driveway

Runoff = 1.18 cfs @ 12.09 hrs, Volume= 0.083 af, Depth> 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.168	98	Paved parking, HSG B
0.081	61	>75% Grass cover, Good, HSG B
0.249	86	Weighted Average
0.081		32.53% Pervious Area
0.168		67.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S-B: west driveway

Summary for Subcatchment 2S-C: west parking

Runoff = 7.57 cfs @ 12.07 hrs, Volume= 0.552 af, Depth> 4.85"

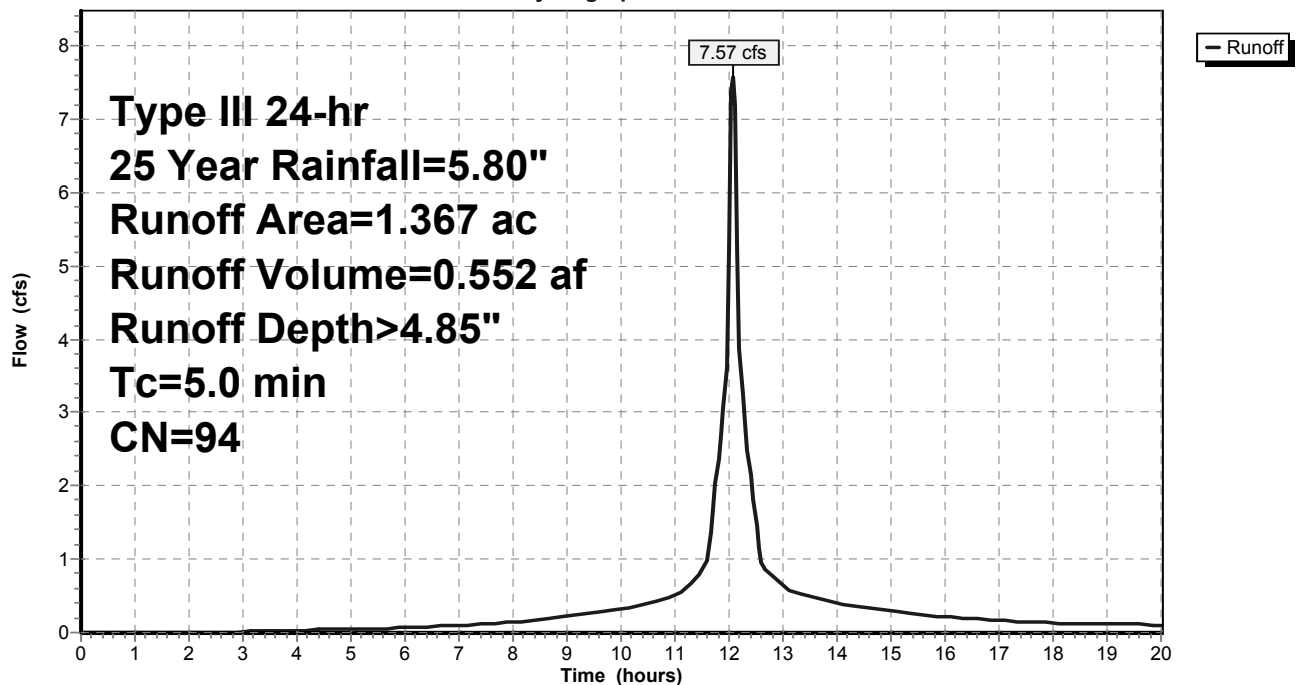
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
1.220	98	Paved parking, HSG C
0.147	61	>75% Grass cover, Good, HSG B
1.367	94	Weighted Average
0.147		10.75% Pervious Area
1.220		89.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S-C: west parking

Hydrograph



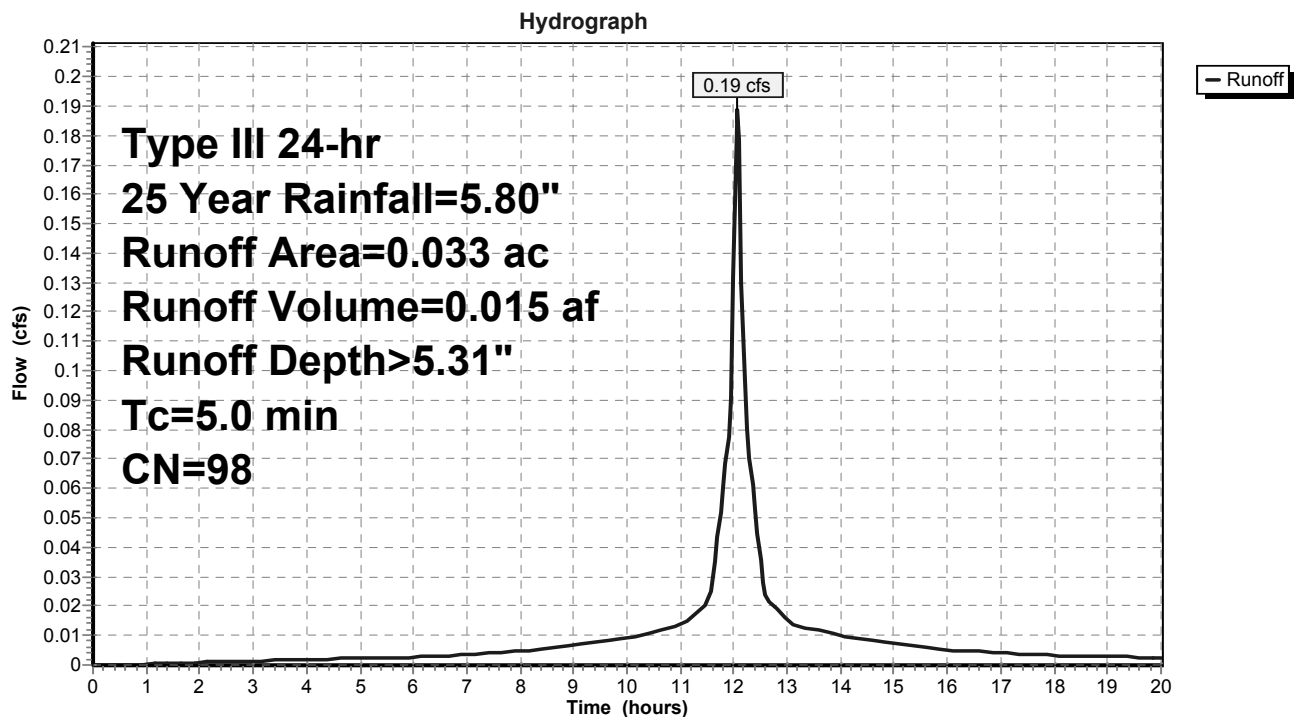
Summary for Subcatchment 2S-D: loading dock

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Depth> 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.033	98	Paved parking, HSG B
0.033		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S-D: loading dock

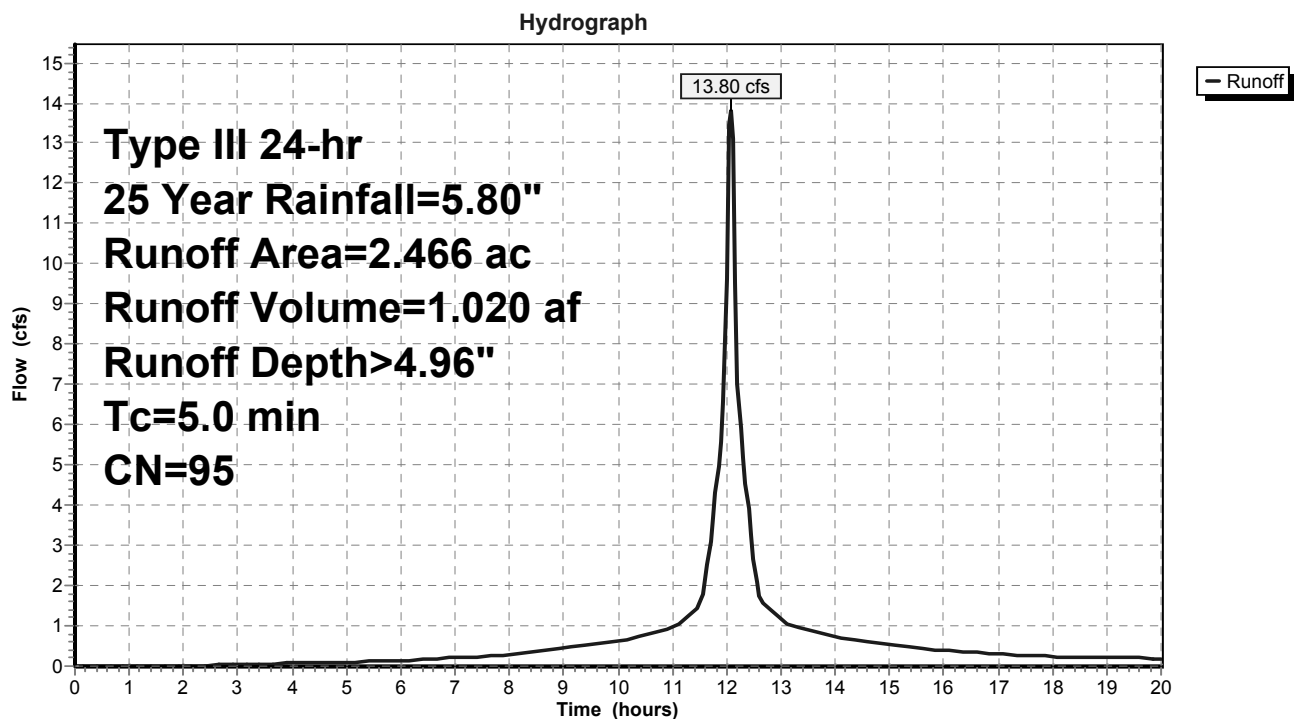
Summary for Subcatchment 2S-E: rooftops & east side

Runoff = 13.80 cfs @ 12.07 hrs, Volume= 1.020 af, Depth> 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.784	98	Roofs, HSG B
0.824	98	Roofs, HSG B
0.664	98	Paved parking, HSG B
0.164	61	>75% Grass cover, Good, HSG B
0.030	65	Woods/grass comb., Fair, HSG B
2.466	95	Weighted Average
0.194		7.87% Pervious Area
2.272		92.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S-E: rooftops & east side

Summary for Subcatchment 2S-F: frontage/ROW

Runoff = 5.91 cfs @ 12.17 hrs, Volume= 0.511 af, Depth> 4.40"

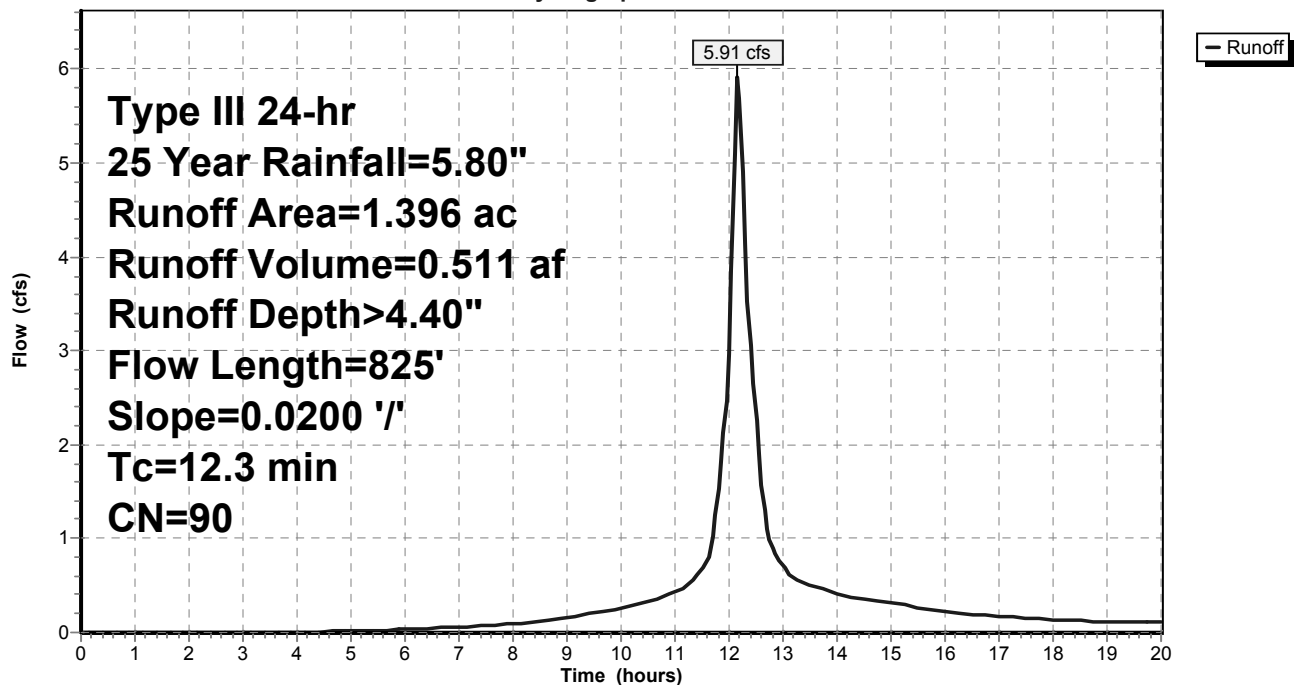
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.281	98	Paved parking, HSG B
0.130	61	>75% Grass cover, Good, HSG B
0.613	98	Paved roads w/curbs & sewers, HSG B
0.192	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.396	90	Weighted Average
0.310		22.21% Pervious Area
1.086		77.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
4.4	750	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.3	825	Total			

Subcatchment 2S-F: frontage/ROW

Hydrograph



Summary for Subcatchment 3S: East Area

Runoff = 0.71 cfs @ 12.07 hrs, Volume= 0.048 af, Depth> 3.77"

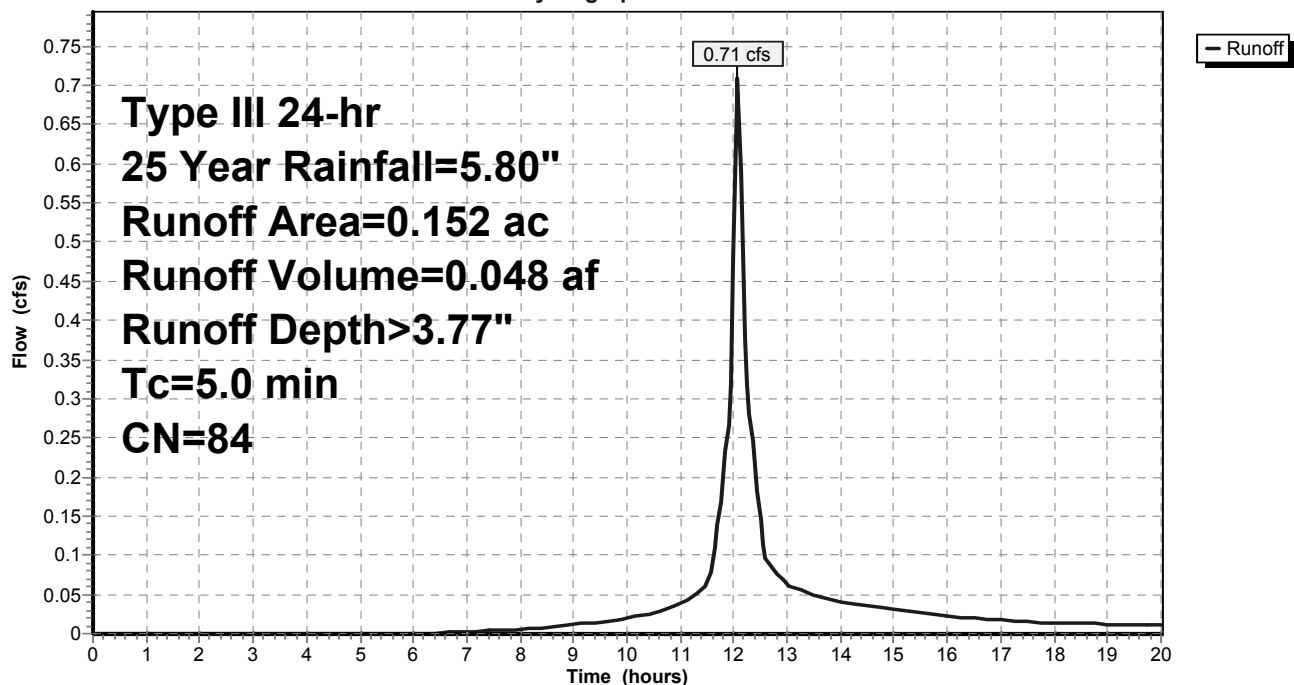
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.039	98	Paved parking, HSG B
0.045	61	>75% Grass cover, Good, HSG B
0.037	98	Paved roads w/curbs & sewers, HSG B
0.012	65	Woods/grass comb., Fair, HSG B
0.017	98	Paved parking, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.152	84	Weighted Average
0.059		38.82% Pervious Area
0.093		61.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 3S: East Area

Hydrograph



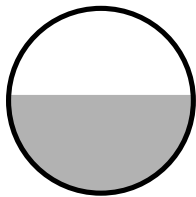
Summary for Reach 2R: reach

Inflow Area = 13.077 ac, 38.49% Impervious, Inflow Depth > 1.71" for 25 Year event
 Inflow = 16.34 cfs @ 12.09 hrs, Volume= 1.858 af
 Outflow = 15.93 cfs @ 12.12 hrs, Volume= 1.855 af, Atten= 3%, Lag= 1.9 min

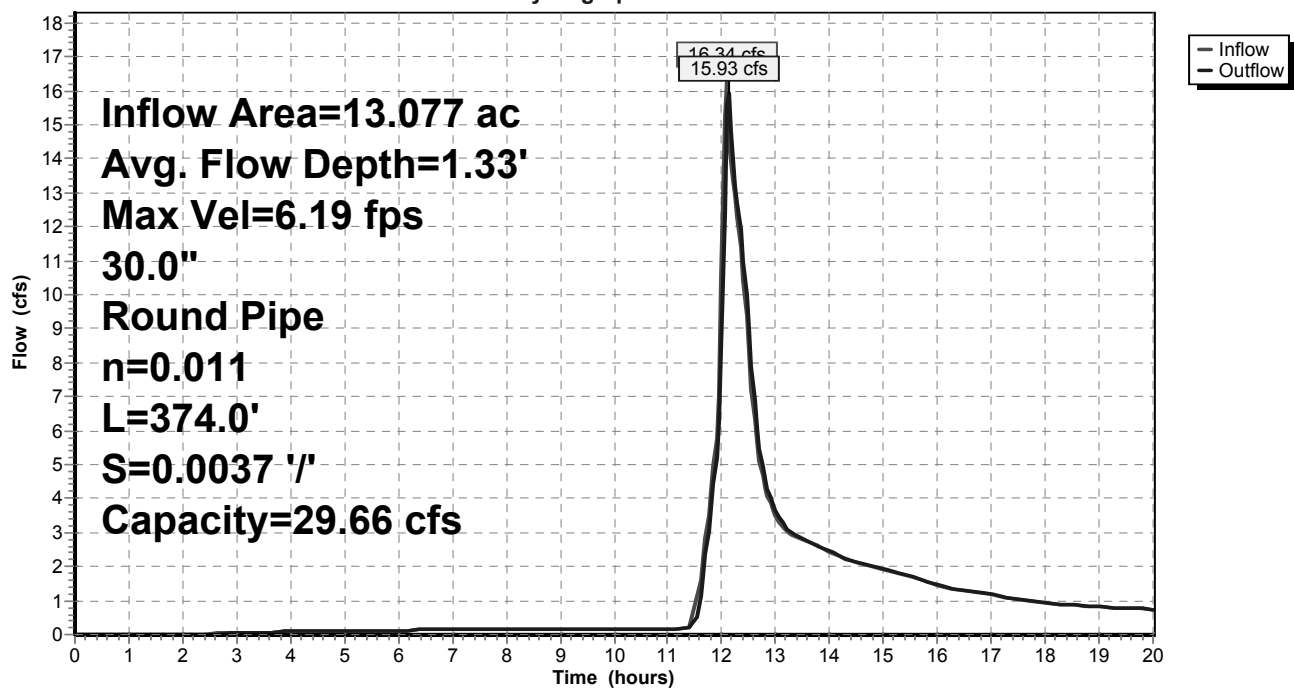
Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.19 fps, Min. Travel Time= 1.0 min
 Avg. Velocity= 2.24 fps, Avg. Travel Time= 2.8 min

Peak Storage= 990 cf @ 12.11 hrs
 Average Depth at Peak Storage= 1.33'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.66 cfs

30.0" Round Pipe
 n= 0.011
 Length= 374.0' Slope= 0.0037 '/'
 Inlet Invert= 12.55', Outlet Invert= 11.15'

**Reach 2R: reach**

Hydrograph



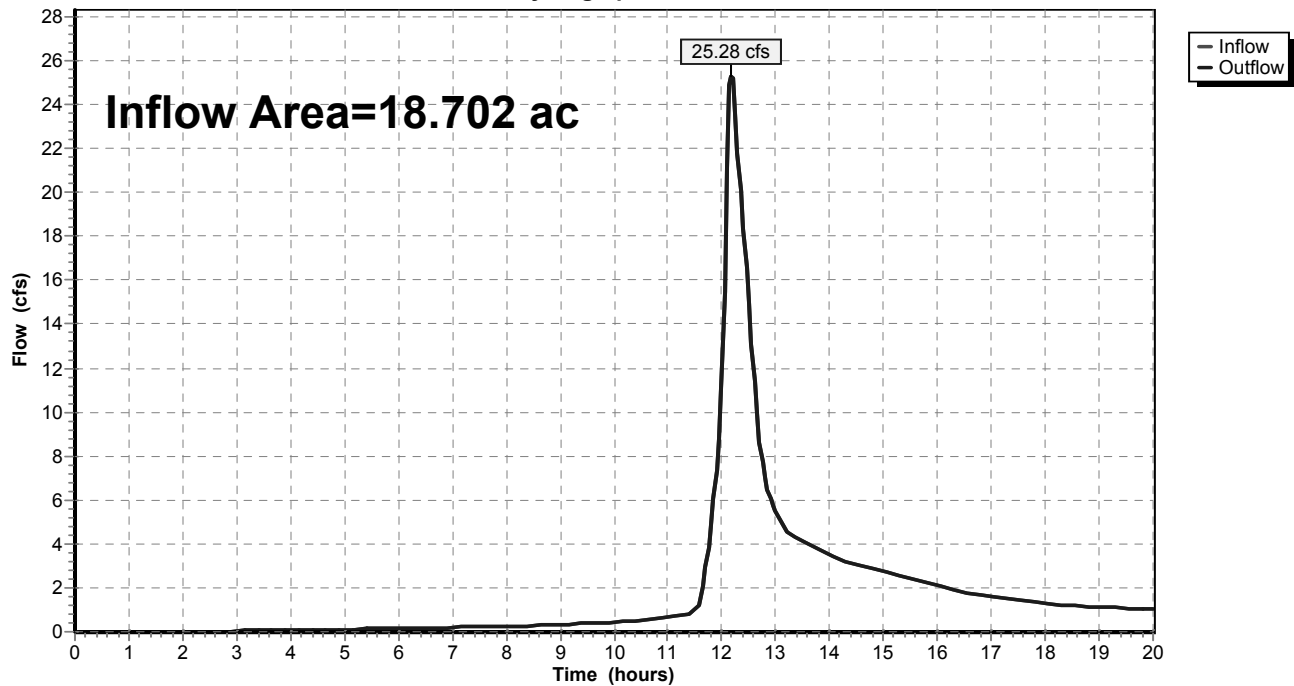
Summary for Reach 4R: POI 1

Inflow Area = 18.702 ac, 36.76% Impervious, Inflow Depth > 1.81" for 25 Year event
Inflow = 25.28 cfs @ 12.18 hrs, Volume= 2.816 af
Outflow = 25.28 cfs @ 12.18 hrs, Volume= 2.816 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: POI 1

Hydrograph



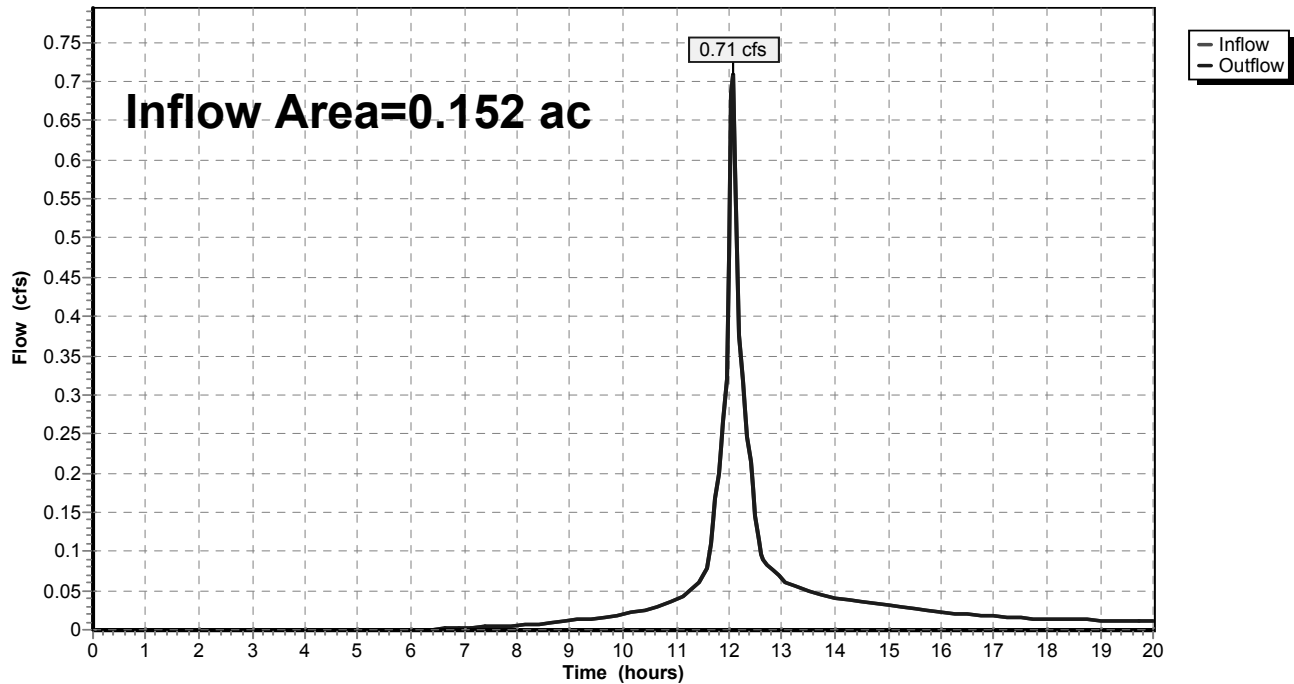
Summary for Reach 5R: POI 3

Inflow Area = 0.152 ac, 61.18% Impervious, Inflow Depth > 3.77" for 25 Year event
Inflow = 0.71 cfs @ 12.07 hrs, Volume= 0.048 af
Outflow = 0.71 cfs @ 12.07 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: POI 3

Hydrograph



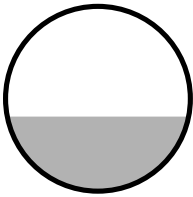
Summary for Reach 6R:

Inflow Area = 4.229 ac, 17.88% Impervious, Inflow Depth > 1.29" for 25 Year event
 Inflow = 4.58 cfs @ 12.19 hrs, Volume= 0.455 af
 Outflow = 4.57 cfs @ 12.20 hrs, Volume= 0.454 af, Atten= 0%, Lag= 0.4 min

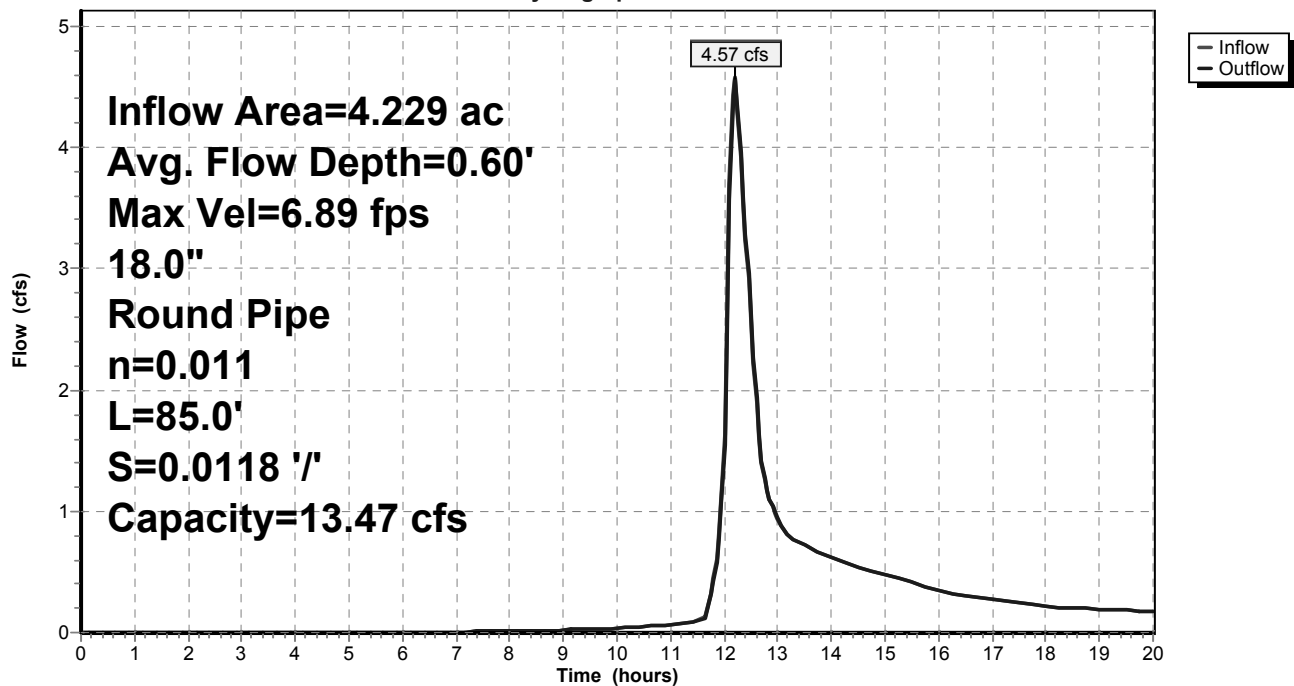
Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.89 fps, Min. Travel Time= 0.2 min
 Avg. Velocity= 2.57 fps, Avg. Travel Time= 0.6 min

Peak Storage= 57 cf @ 12.20 hrs
 Average Depth at Peak Storage= 0.60'
 Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.47 cfs

18.0" Round Pipe
 n= 0.011
 Length= 85.0' Slope= 0.0118 '/'
 Inlet Invert= 14.40', Outlet Invert= 13.40'

**Reach 6R:**

Hydrograph



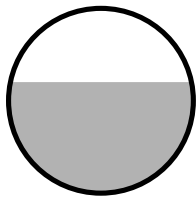
Summary for Reach 7R:

Inflow Area = 1.396 ac, 77.79% Impervious, Inflow Depth > 4.40" for 25 Year event
 Inflow = 5.91 cfs @ 12.17 hrs, Volume= 0.511 af
 Outflow = 5.86 cfs @ 12.17 hrs, Volume= 0.511 af, Atten= 1%, Lag= 0.6 min

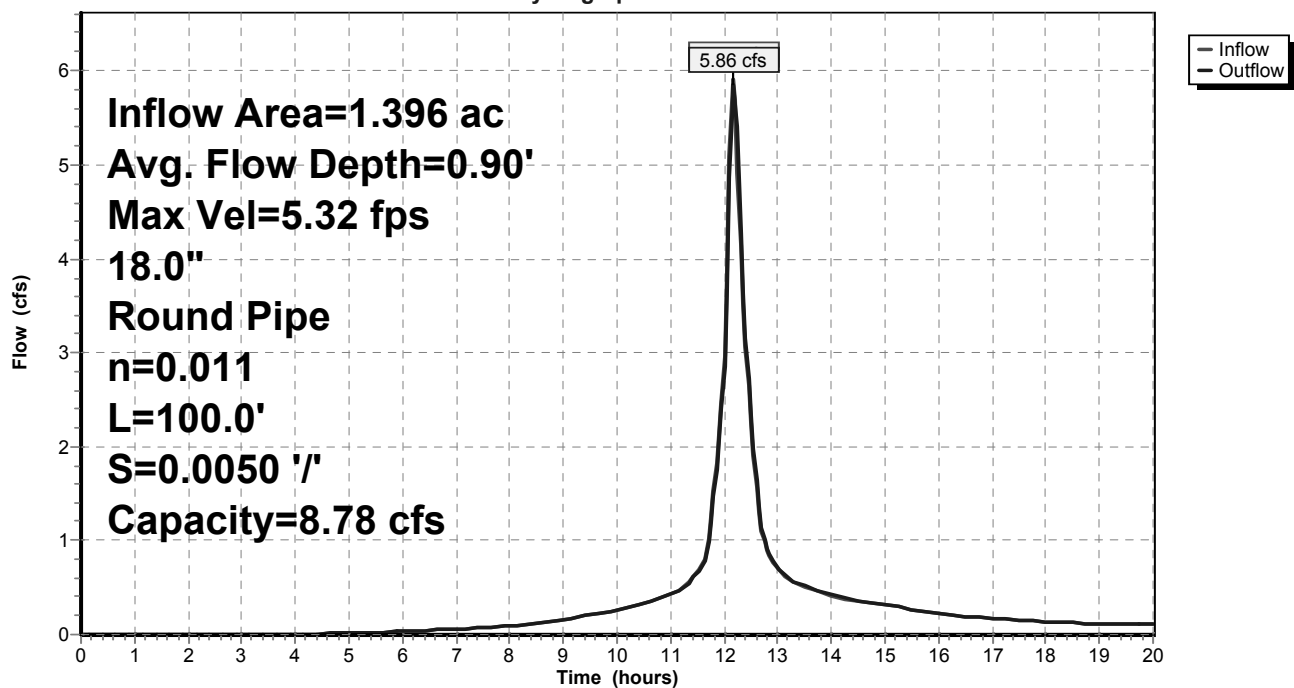
Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 5.32 fps, Min. Travel Time= 0.3 min
 Avg. Velocity= 2.04 fps, Avg. Travel Time= 0.8 min

Peak Storage= 111 cf @ 12.17 hrs
 Average Depth at Peak Storage= 0.90'
 Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.78 cfs

18.0" Round Pipe
 n= 0.011
 Length= 100.0' Slope= 0.0050 '/'
 Inlet Invert= 10.25', Outlet Invert= 9.75'

**Reach 7R:**

Hydrograph



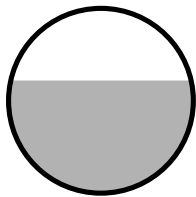
Summary for Reach 8R:

Inflow Area = 14.473 ac, 42.28% Impervious, Inflow Depth > 1.96" for 25 Year event
 Inflow = 21.13 cfs @ 12.16 hrs, Volume= 2.363 af
 Outflow = 20.97 cfs @ 12.17 hrs, Volume= 2.362 af, Atten= 1%, Lag= 0.6 min

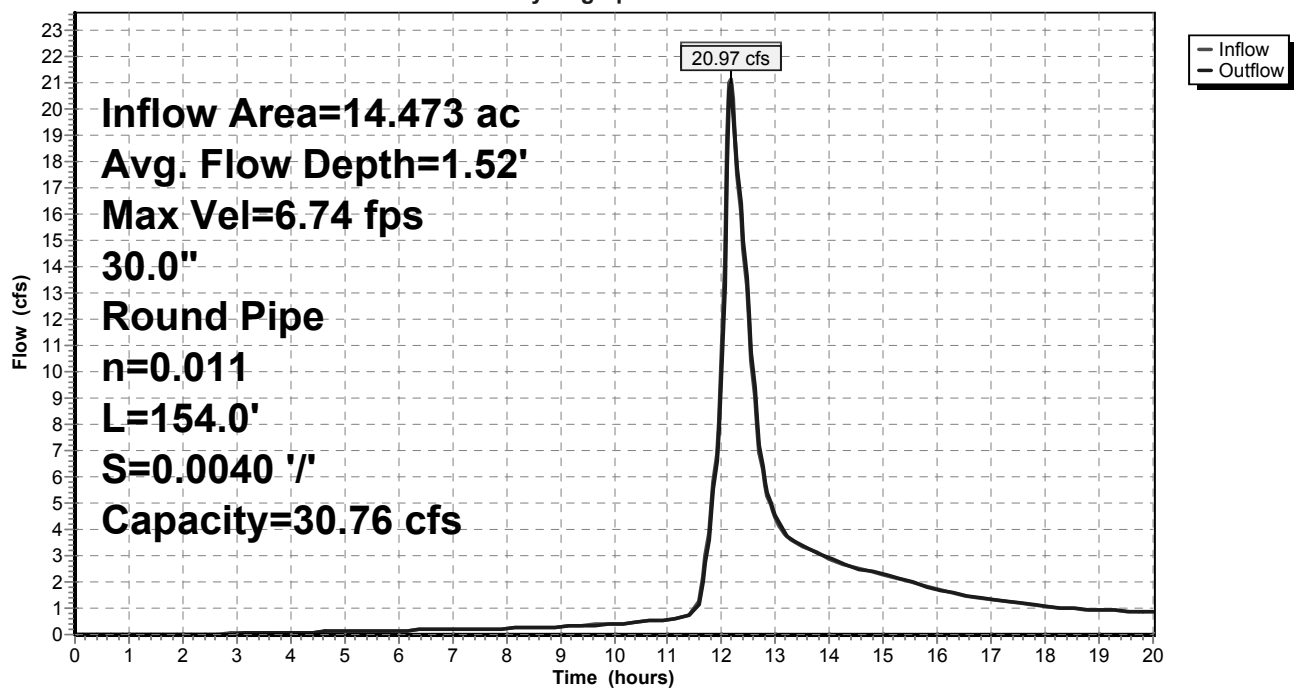
Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 6.74 fps, Min. Travel Time= 0.4 min
 Avg. Velocity= 2.52 fps, Avg. Travel Time= 1.0 min

Peak Storage= 482 cf @ 12.17 hrs
 Average Depth at Peak Storage= 1.52'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 30.76 cfs

30.0" Round Pipe
 n= 0.011
 Length= 154.0' Slope= 0.0040 '/'
 Inlet Invert= 8.88', Outlet Invert= 8.26'

**Reach 8R:**

Hydrograph



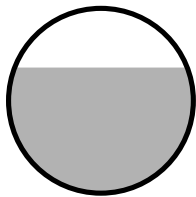
Summary for Reach 9R:

Inflow Area = 14.473 ac, 42.28% Impervious, Inflow Depth > 1.96" for 25 Year event
Inflow = 21.27 cfs @ 12.14 hrs, Volume= 2.366 af
Outflow = 21.13 cfs @ 12.16 hrs, Volume= 2.363 af, Atten= 1%, Lag= 1.2 min

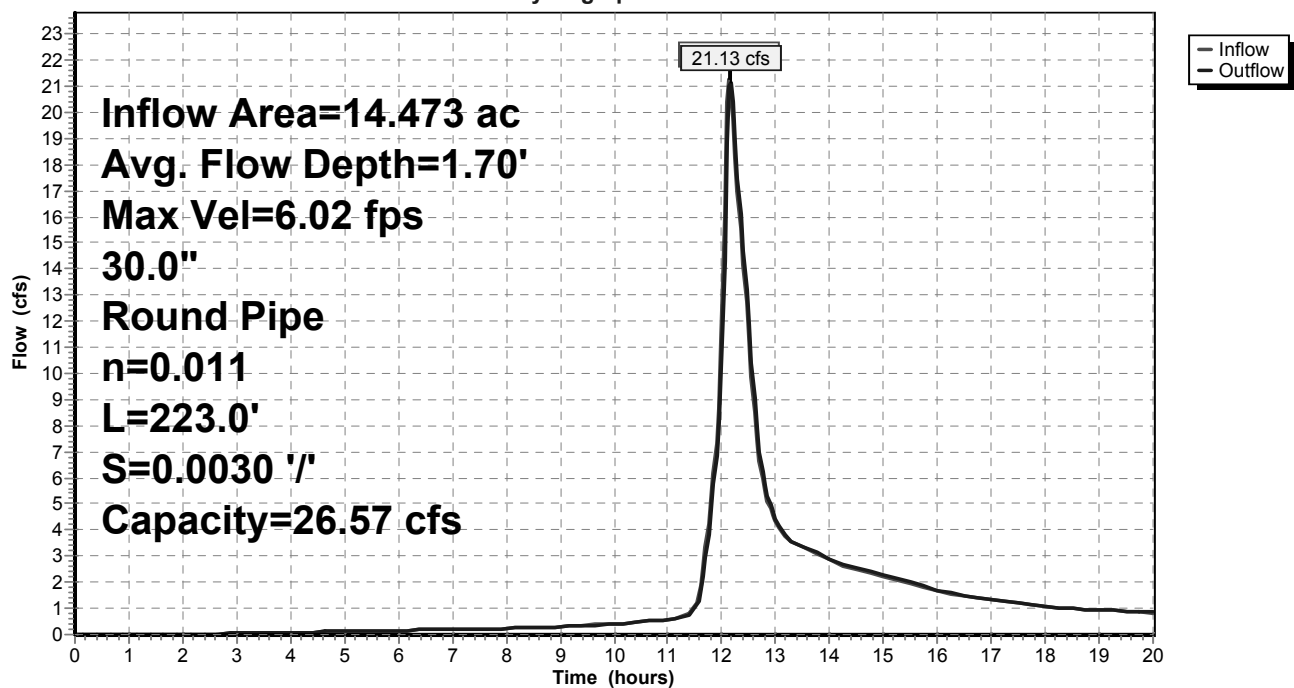
Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.02 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 1.6 min

Peak Storage= 791 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.70'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.57 cfs

30.0" Round Pipe
n= 0.011
Length= 223.0' Slope= 0.0030 '/'
Inlet Invert= 9.65', Outlet Invert= 8.98'

**Reach 9R:**

Hydrograph



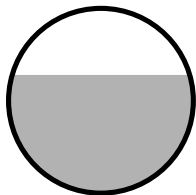
Summary for Reach 10R:

Inflow Area = 18.702 ac, 36.76% Impervious, Inflow Depth > 1.81" for 25 Year event
 Inflow = 25.30 cfs @ 12.18 hrs, Volume= 2.816 af
 Outflow = 25.28 cfs @ 12.18 hrs, Volume= 2.816 af, Atten= 0%, Lag= 0.2 min

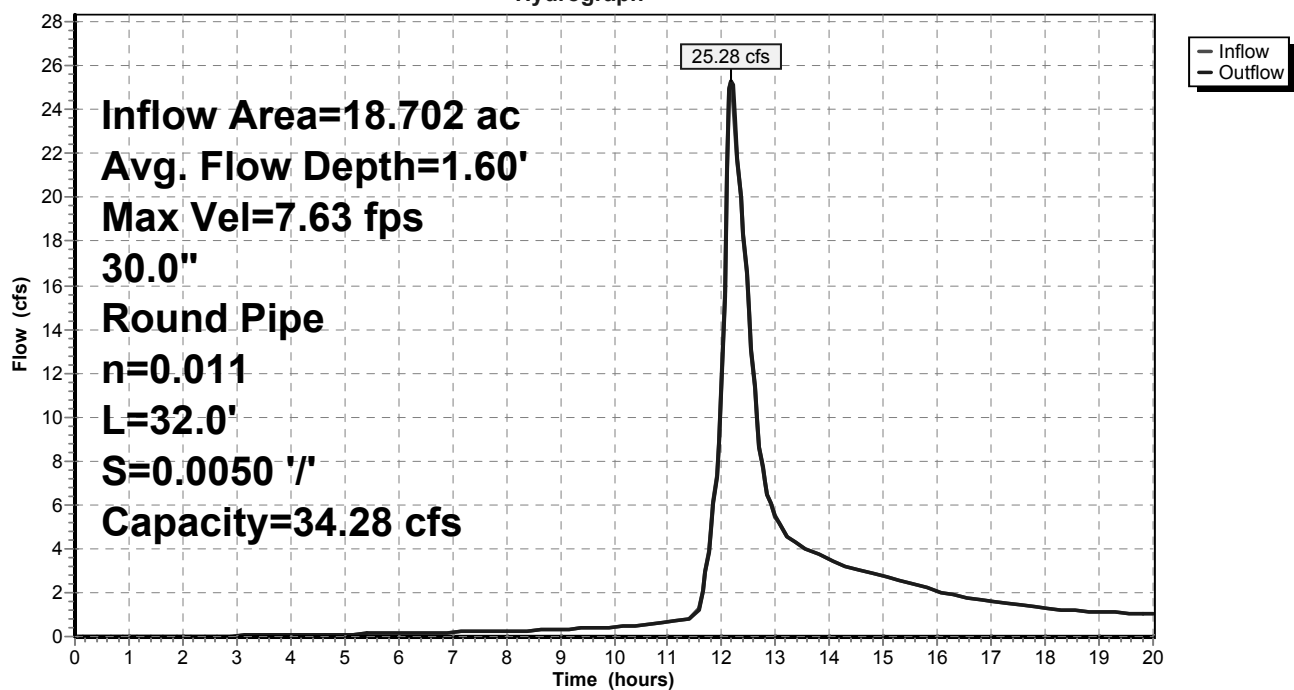
Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 7.63 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.84 fps, Avg. Travel Time= 0.2 min

Peak Storage= 106 cf @ 12.18 hrs
 Average Depth at Peak Storage= 1.60'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 34.28 cfs

30.0" Round Pipe
 n= 0.011
 Length= 32.0' Slope= 0.0050 '/'
 Inlet Invert= 8.16', Outlet Invert= 8.00'

**Reach 10R:**

Hydrograph



Summary for Pond 2P: Porous Pavement

Inflow Area = 1.367 ac, 89.25% Impervious, Inflow Depth > 4.85" for 25 Year event
 Inflow = 7.57 cfs @ 12.07 hrs, Volume= 0.552 af
 Outflow = 0.51 cfs @ 13.40 hrs, Volume= 0.282 af, Atten= 93%, Lag= 79.8 min
 Primary = 0.51 cfs @ 13.40 hrs, Volume= 0.282 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 20.74' @ 13.40 hrs Surf.Area= 44,844 sf Storage= 14,721 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 114.0 min (854.3 - 740.2)

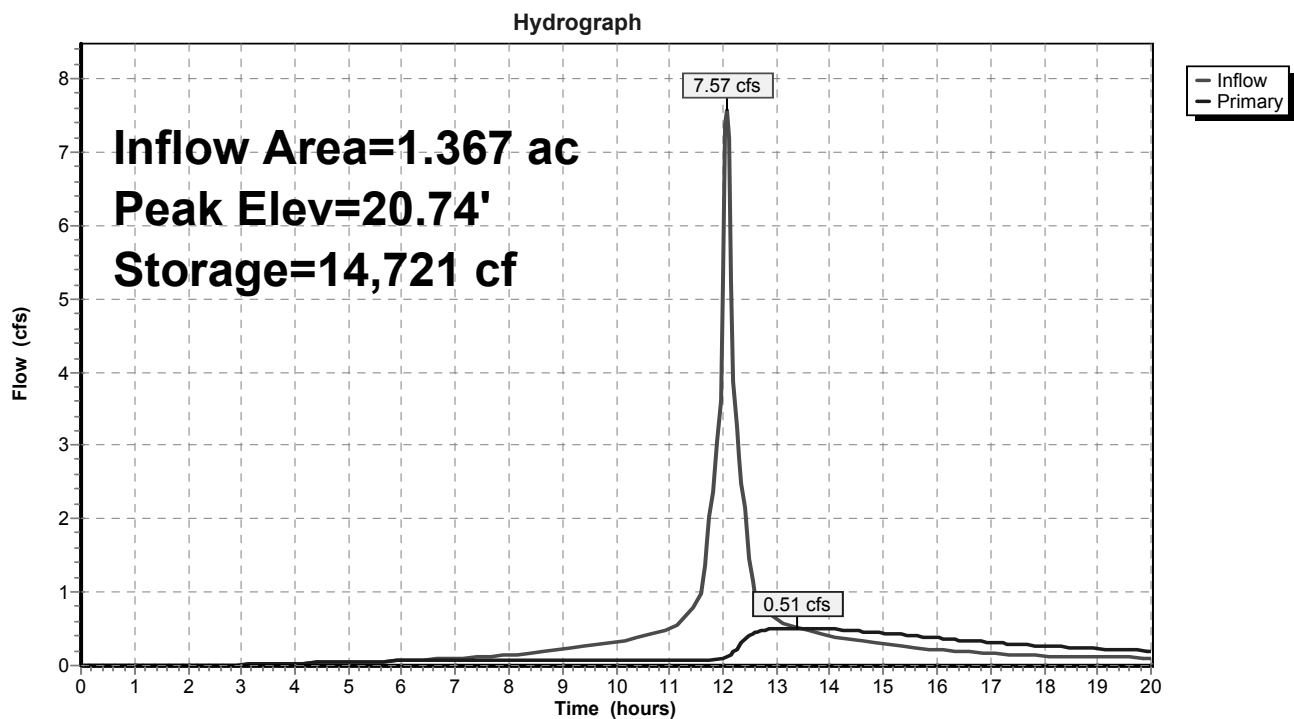
Volume	Invert	Avail.Storage	Storage Description
#1	18.17'	17,938 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.17	44,844	0.0	0	0
19.92	44,844	0.0	0	0
20.92	44,844	40.0	17,938	17,938
21.50	44,844	0.0	0	17,938

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.17'	2.500 in/hr Exfiltration over Surface area
#2	Primary	18.17'	1.5" Vert. Orifice/Grate C= 0.600
#3	Primary	20.42'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.51 cfs @ 13.40 hrs HW=20.74' (Free Discharge)

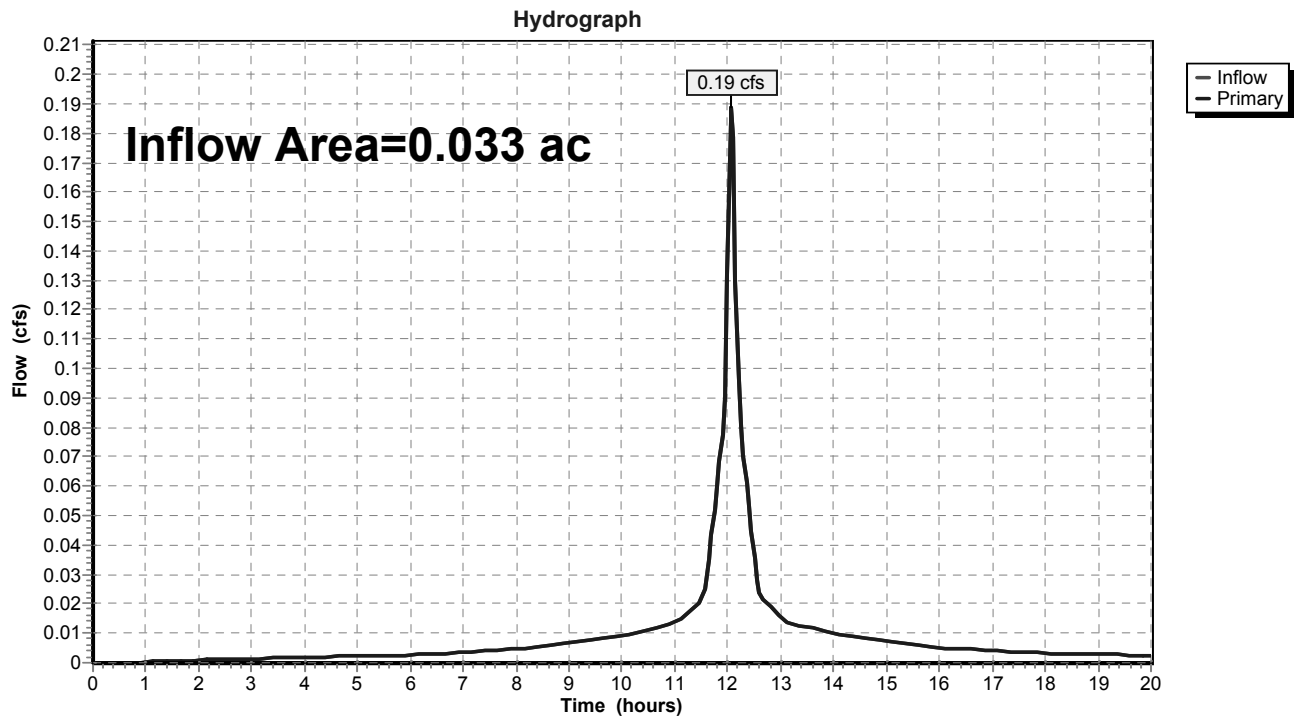
2=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.63 fps)
 1=Exfiltration (Passes 0.09 cfs of 2.60 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.42 cfs @ 1.93 fps)

Pond 2P: Porous Pavement

Summary for Pond 3P: Filter Cartridge

Inflow Area = 0.033 ac, 100.00% Impervious, Inflow Depth > 5.31" for 25 Year event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af
Primary = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Pond 3P: Filter Cartridge

Summary for Pond 4P: Subsurface Sand Filter

Inflow Area = 2.466 ac, 92.13% Impervious, Inflow Depth > 4.96" for 25 Year event
 Inflow = 13.80 cfs @ 12.07 hrs, Volume= 1.020 af
 Outflow = 13.64 cfs @ 12.07 hrs, Volume= 0.804 af, Atten= 1%, Lag= 0.0 min
 Primary = 13.64 cfs @ 12.07 hrs, Volume= 0.804 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 20.11' @ 12.07 hrs Surf.Area= 0.118 ac Storage= 0.205 af

Plug-Flow detention time= 97.9 min calculated for 0.802 af (79% of inflow)
 Center-of-Mass det. time= 41.4 min (777.0 - 735.6)

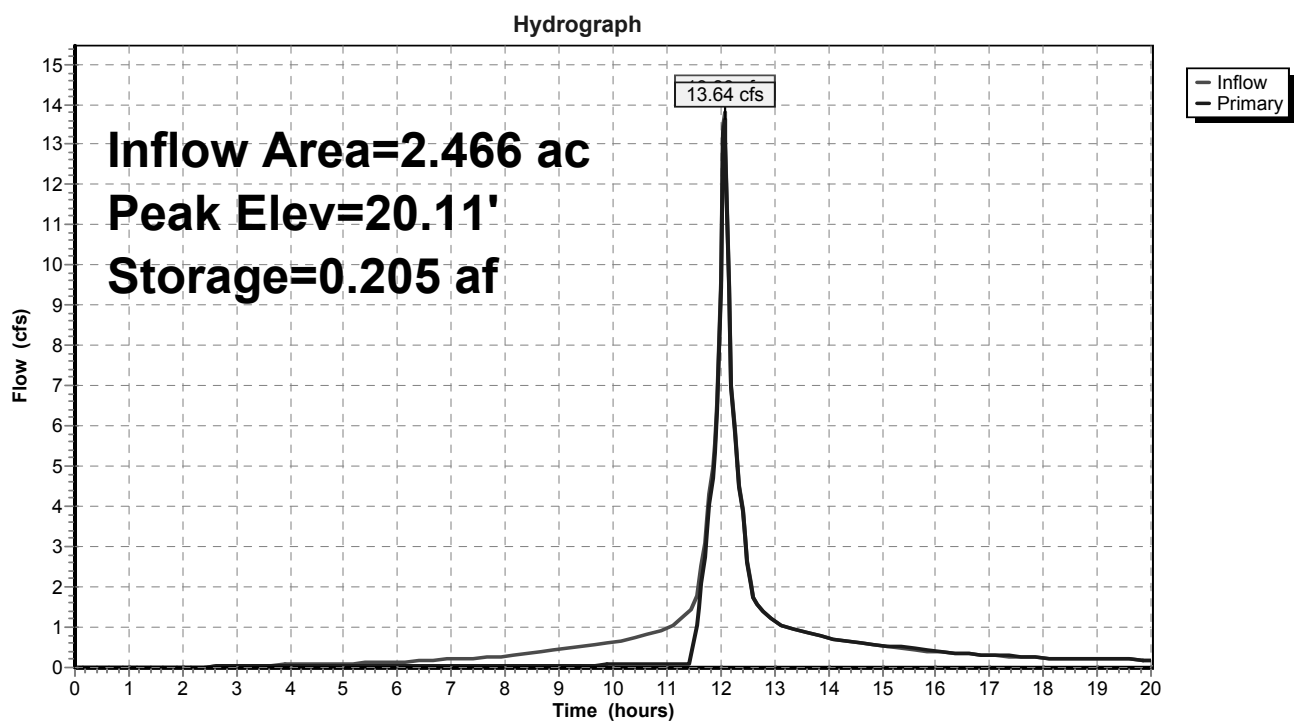
Volume	Invert	Avail.Storage	Storage Description
#1A	15.83'	0.091 af	13.19'W x 386.37'L x 2.94'H Field A 0.344 af Overall - 0.116 af Embedded = 0.228 af x 40.0% Voids
#2A	16.33'	0.111 af	ACF R-Tank HD 1 x 1141 Inside #1 Inside= 15.7"W x 17.3"H => 1.80 sf x 2.35'L = 4.2 cf Outside= 15.7"W x 17.3"H => 1.89 sf x 2.35'L = 4.4 cf 7 Rows of 163 Chambers
#3	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
#4	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
		0.206 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	15.00'	2.500 in/hr Exfiltration over Surface area
#2	Primary	14.00'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 4	18.66'	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
#4	Primary	18.20'	18.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#5	Device 6	18.66'	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
#6	Primary	18.20'	12.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=13.14 cfs @ 12.07 hrs HW=20.03' (Free Discharge)

- 2=Orifice/Grate (Orifice Controls 0.09 cfs @ 11.78 fps)
- 1=Exfiltration (Passes 0.09 cfs of 0.30 cfs potential flow)
- 4=Culvert (Inlet Controls 8.86 cfs @ 5.01 fps)
- 3=Broad-Crested Rectangular Weir (Passes 8.86 cfs of 21.37 cfs potential flow)
- 6=Culvert (Barrel Controls 4.19 cfs @ 5.34 fps)
- 5=Broad-Crested Rectangular Weir (Passes 4.19 cfs of 21.37 cfs potential flow)

Pond 4P: Subsurface Sand Filter

Summary for Pond FP1: FocalPoint 20sf

Inflow Area = 0.249 ac, 67.47% Impervious, Inflow Depth > 3.98" for 25 Year event
 Inflow = 1.18 cfs @ 12.09 hrs, Volume= 0.083 af
 Outflow = 1.16 cfs @ 12.09 hrs, Volume= 0.083 af, Atten= 1%, Lag= 0.3 min
 Primary = 0.08 cfs @ 11.25 hrs, Volume= 0.047 af
 Secondary = 1.08 cfs @ 12.09 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 18.78' @ 12.09 hrs Surf.Area= 36 sf Storage= 66 cf

Plug-Flow detention time= 2.1 min calculated for 0.082 af (100% of inflow)
 Center-of-Mass det. time= 2.1 min (769.8 - 767.7)

Volume	Invert	Avail.Storage	Storage Description
#1	18.06'	92 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#2	17.90'	6 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		98 cf	Total Available Storage

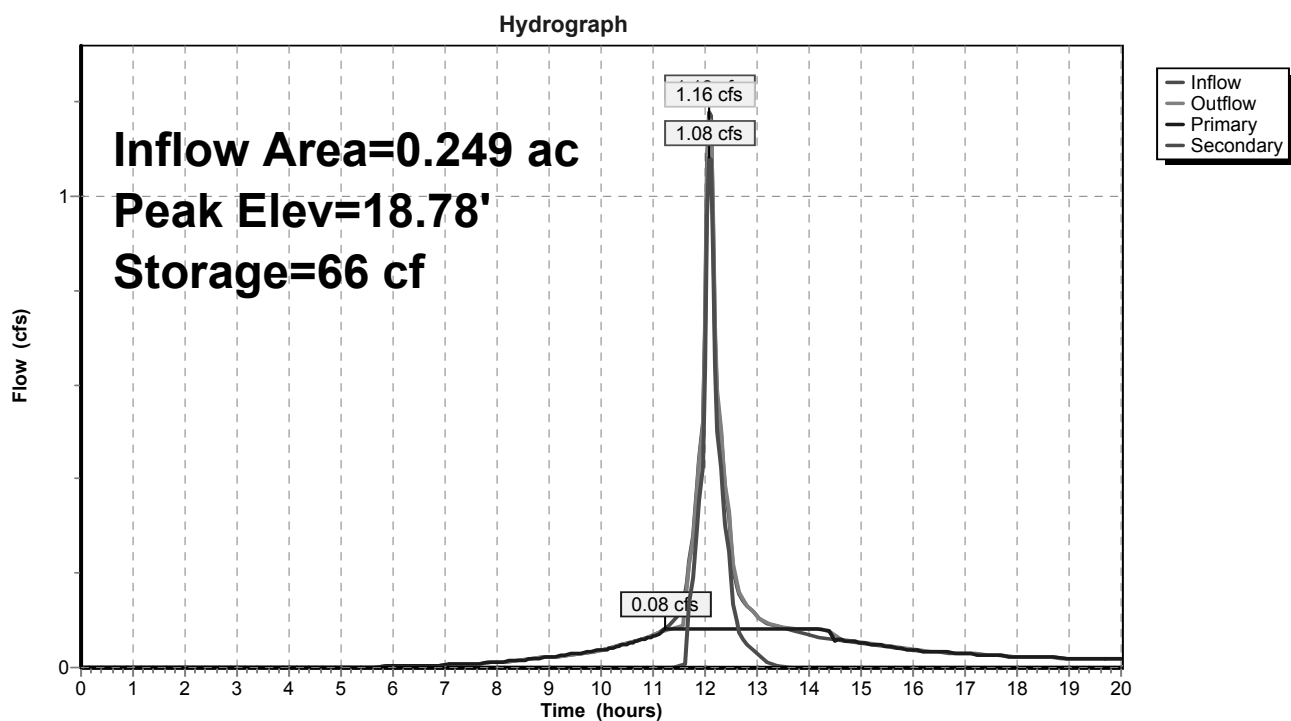
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.06	36	0	0
19.00	160	92	92

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.90	36	26.0	0	0	36
18.06	36	26.0	6	6	40

Device	Routing	Invert	Outlet Devices
#1	Primary	17.90'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	18.56'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 11.25 hrs HW=17.91' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=1.06 cfs @ 12.09 hrs HW=18.78' (Free Discharge)
 ↑2=Orifice/Grate (Weir Controls 1.06 cfs @ 1.54 fps)

Pond FP1: FocalPoint 20sf

ATTACHMENT C

Water Quality Calculations

VA Clinic - Stormwater Management Summary

01.10.20

Designed By: KAB

Checked By: SRB

Subarea ID	New Development			Treated New Impervious Area (sf)	Treated New Landscaped Area (sf)
	Impervious Area (sf)	Landscaped Area (sf)	Total Developed Area (sf)		
1S	0	0	0	0	0
2S-A	331	7,960	8,291	0	0
2S-B	7,323	3,540	10,863	7,323	3,540
2S-C	53,143	6,394	59,537	53,143	6,394
2S-D	1,445	0	1,445	1,445	0
2S-E	98,962	7,143	106,105	98,962	7,143
2S-F*	8,364	7,849	16,213	0	0
3S	1,705	1,962	3,667	0	0
Total (sf)	171,273	26,999	206,121	160,873	17,077
Total (ac)	3.93	0.62	4.73	3.69	0.39

Treatment Summary					
Subarea ID	Treatment Method	Water Quality Volume Required (cf)	Water Quality Volume Provided (cf)	BMP Surface Area Required (sf)	BMP Surface Area Provided (sf)
1S	N/A	0	0	0	0
2S-A	N/A	0	0	0	0
2S-B	FocalPoint (4'x9')	N/A	N/A	N/A	N/A
2S-C	Porous Pavement	4,642	12,314	11,907	37,728
2S-D	Filter Cartridge Insert	N/A	N/A	N/A	N/A
2S-E	Subsurface Sand Filter	8,485	8,788	5,091	5,096
2S-F	N/A	0	0	0	0
3S	N/A	0	0	0	0

Treatment Summary		
	Required	Provided
Treated New Impervious (%)	95%	0.00%
Treated New Developed (%)	80%	86.33%

VA Clinic - Drawdown Calcs

01.17.2020

Designed By:
KAB

Checked By: SRB

Drawdown Calculation - Subsurface Sand Filter

Orifice Diameter =1.25 in

Elev. (ft)	Depth (ft)	Surface Area (sq.ft)	Ave. End Area (sq.ft)	End Area Depth (ft)	Incremental Volume (cf)	Head, h (ft)	Orifice Flow (cfs)	Drawdown Time (secs)	Drawdown Time (hours)
18.66	2.83	5,096	5096.00	2.83	8787.50	3.83	0.0803	109471.17	30.409
15.83	0.00	5,096	0.00	0.00	0.00	2.33	0.0626	0.00	0.000
								TOTAL	30.409

Orifice Formula: $CA(2gh)^{1/2}$
Orifice Diameter: 1.25 inch
A: 0.008522 sq.ft
Filter Thickness: 2.33 feet
g: 32.174 ft/s²
C: 0.6 Orifice/Grate

01.07.2020 VA Clinic Pretreatment Calcs Designed By: KAB Checked By: SRB	
Subsurface Sand Filter	
Total Impervious Area (sf)	60422
Total Landscape Area (sf)	6,925
Total Developed Area (ac)	1.55
1-yr 24-hr Storm Event Peak Flow (cfs)	3.52
Pretreatment R-Tank Modules Required	177

1-yr 24-hr rain

2.61"

C (impervious)

0.95

C (pervious)

0.2

ATTACHMENT D

FocalPoint® Design Worksheet/Checklist

FOCALPOINT

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM

US DEPT OF VETS AFFAIRS – COMMUNITY OUTPATIENT – PORTLAND, MAINE

MAINE – CHAPTER 500 DESIGN WORKSHEET/CHECKLIST

1. FocalPoint Bed Area (min 174 square feet per acre of impervious area (e.g. 0.2 acres = 35 sf))

- Tributary Impervious area = 0.168 ac. (A)
- Tributary Pervious area = 0.081 ac. (B)
- Min FocalPoint bed area req'd = $(((A) \times 1.0) + ((B) \times 0.4)) \times 174$ = 34.89 sf.
- FocalPoint Bed Area provided * = 36 sf.
- Dimensions of Proposed FocalPoint = 4 ft x 9 ft

* see criteria 2. to determine if minimum size is appropriate.

2. A 0.95 inch Type III 24hr rainfall event shall be modelled to demonstrate the entire storm volume is treated prior to activation of the overflow (typically set at 6-12" above the mulch)

- Temporary storage depth provided = 6 inches (typ 6" to 12")
- Temporary storage volume provided at above depth = 41 cubic feet.
- Peak ponding depth from 0.95" 24hr storm event = 0 inches

3. Ratio of the surface area of the filter media (sf) to the temporary ponding volume (cf) shall be no less than 1:5

- Ratio of FocalPoint Bed Area : Temporary Storage Vol = 1 : 1.14

4. Subsurface R-Tank or Chamber Treatment Row must be sized to treat the peak flow from a 1 yr-24hr storm event.

- 1yr 24hr Peak Flowrate = 0.39 cfs
- Chamber model selected
 - o Cultec 330 XLHD (1 chamber per 0.227 cfs) ☐
 - o Cultec 150XLHD (1 chamber per 0.185 cfs) ☐
 - o R-Tank modules (1 module per 0.02 cfs) ☒
- Number of Chambers/modules required = 20

5. Controlled release of the Channel Protection over 24-48 hrs

- Controlled release of the channel protection volume is being achieved by:
 - o Expanded subsurface storage basin with OCS ☐
 - o Surface detention basin with OCS ☐

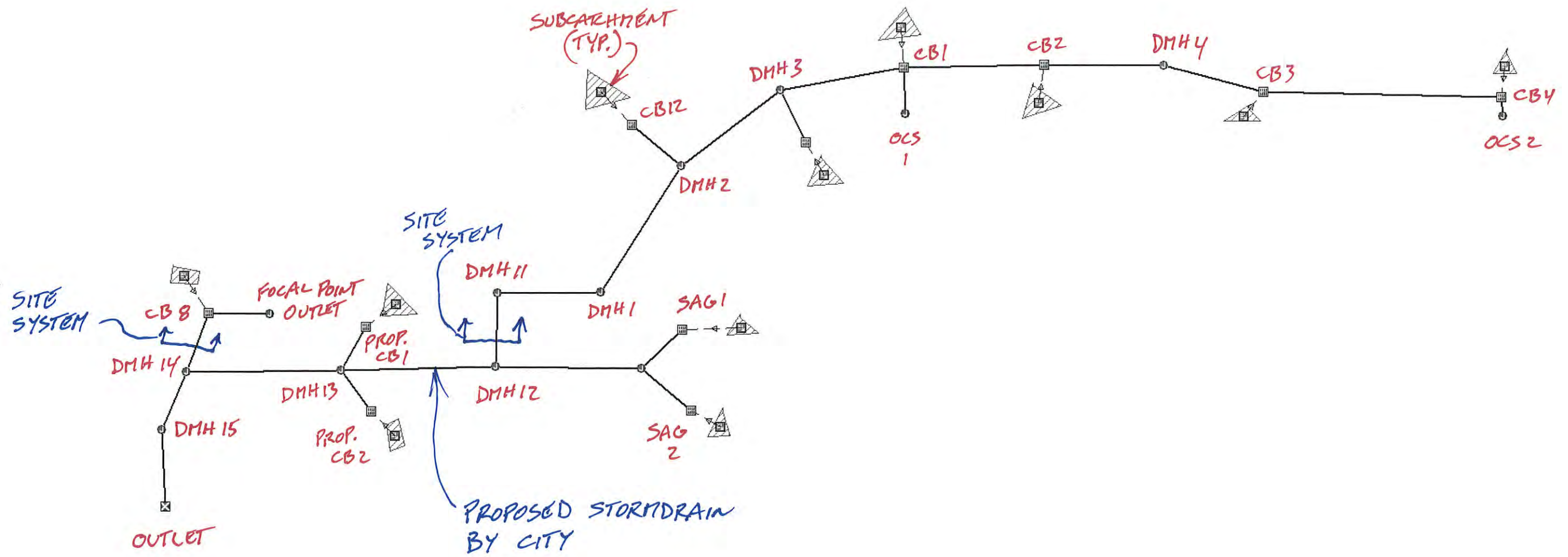
6. A landscape plan for the FocalPoint bed area has been prepared ☐

7. The Design shall be reviewed by the manufacturer's representative prior to submission and installation will be overseen by the manufacturer's representative.

- The Design has been reviewed by ACF Environmental ☐
- Engineer will coordinate installation inspection with ACF ☒

ATTACHMENT E

Autodesk Storm and Sanitary Analysis



SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Initial Flow	Peak Flow	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)
1	Link-06	Inlet-04	Inlet-06	121.00	17.95	16.65	1.30	1.0700	CIRCULAR	24.000	0.0110	0.5000	0.5000	0.00	11.96	0 00:10	8.51	0.24	27.71	0.43	0.46	0.92
2	Link-07	Inlet-06	64	52.00	16.55	16.05	0.50	0.9600	CIRCULAR	24.000	0.0110	0.5000	0.5000	0.00	13.40	0 00:10	8.39	0.10	26.22	0.51	0.51	1.01
3	Link-08	64	Inlet-07	65.00	15.95	15.26	0.69	1.0600	CIRCULAR	24.000	0.0110	0.5000	0.5000	0.00	13.39	0 00:10	8.71	0.12	27.55	0.49	0.49	0.98
4	Link-09	Inlet-07	Inlet-08	125.00	15.16	14.30	0.86	0.6900	CIRCULAR	24.000	0.0110	0.5000	0.5000	0.00	15.52	0 00:10	7.65	0.27	22.18	0.70	0.62	1.23
5	Link-10	Inlet-08	64	39.00	13.45	13.14	0.31	0.7900	CIRCULAR	30.000	0.0110	0.5000	0.5000	0.00	23.09	0 00:10	8.95	0.07	43.22	0.53	0.52	1.30
6	Link-12	64	Inlet-08	15.00	18.20	15.61	2.59	17.2700	CIRCULAR	12.000	0.0110	0.5000	0.8000	0.00	7.33	0 00:00	21.56	0.01	17.50	0.42	0.45	0.44
7	Link-13	64	64	98.00	13.04	12.65	0.39	0.4000	CIRCULAR	30.000	0.0110	0.5000	0.5000	0.00	23.08	0 00:10	6.86	0.24	30.58	0.75	0.65	1.62
8	Link-14	64	64	204.00	12.55	11.84	0.71	0.3500	CIRCULAR	30.000	0.0110	0.5000	0.5000	0.00	26.47	0 00:11	6.66	0.51	28.60	0.93	0.76	1.90
9	Link-15	64	64	120.00	11.76	11.40	0.36	0.3000	CIRCULAR	30.000	0.0110	0.5000	0.5000	0.00	26.45	0 00:11	6.20	0.32	26.55	1.00	0.82	2.04
10	Link-16	64	64	50.00	11.30	11.15	0.15	0.3000	CIRCULAR	30.000	0.0110	0.5000	0.5000	0.00	26.44	0 00:11	6.18	0.13	26.55	1.00	0.82	2.04
11	Link-17	Inlet-09	64	20.00	11.35	11.15	0.20	1.0000	CIRCULAR	15.000	0.0110	0.5000	0.8000	0.00	3.58	0 00:05	6.13	0.05	7.63	0.47	0.48	0.60
12	Link-18	Inlet-10	64	20.00	11.35	11.15	0.20	1.0000	CIRCULAR	15.000	0.0110	0.5000	0.8000	0.00	3.58	0 00:05	6.13	0.05	7.63	0.47	0.48	0.60
13	Link-19	64	64	100.00	10.25	9.75	0.50	0.5000	CIRCULAR	18.000	0.0110	0.5000	0.6000	0.00	7.05	0 00:05	5.61	0.30	8.78	0.80	0.68	1.01
14	Link-20	64	64	223.00	9.65	8.98	0.67	0.3000	CIRCULAR	30.000	0.0110	0.5000	1.0000	0.00	26.44	0 00:11	6.24	0.60	26.57	0.99	0.81	2.04
15	Link-21	64	64	154.00	8.88	8.26	0.62	0.4000	CIRCULAR	30.000	0.0110	0.5000	0.6000	0.00	29.65	0 00:07	7.16	0.36	30.76	0.96	0.79	1.97
16	Link-22	64	64	32.00	8.16	8.00	0.16	0.5000	CIRCULAR	30.000	0.0110	0.5000	0.6000	0.00	33.88	0 00:10	7.96	0.07	34.28	0.99	0.81	2.02
17	Link-23	Inlet-11	64	20.00	13.10	12.90	0.20	1.0000	CIRCULAR	15.000	0.0110	0.5000	1.0000	0.00	3.35	0 00:10	6.03	0.06	7.63	0.44	0.46	0.58
18	Link-24	Inlet-12	64	20.00	13.10	12.90	0.20	1.0000	CIRCULAR	15.000	0.0110	0.5000	1.0000	0.00	1.53	0 00:05	4.87	0.07	7.63	0.20	0.30	0.38
19	Link-25	64	Inlet-04	11.00	18.20	18.05	0.15	1.3600	CIRCULAR	18.000	0.0110	0.5000	0.8000	0.00	7.09	0 00:00	8.16	0.02	14.50	0.49	0.49	0.74
20	Link-27	Inlet-13	64	85.00	14.40	13.40	1.00	1.1800	CIRCULAR	18.000	0.0110	0.5000	0.9000	0.00	4.54	0 00:10	6.89	0.21	13.47	0.34	0.40	0.60
21	Link-28	Inlet-15	64	17.00	17.58	12.81	4.77	28.0600	CIRCULAR	18.000	0.0110	0.5000	0.8000	0.00	3.64	0 00:10	20.00	0.01	65.76	0.06	0.16	0.24
22	Link-29	Inlet-16	64	31.00	14.50	13.22	1.28	4.1300	CIRCULAR	8.040	0.0110	0.5000	0.8000	0.00	0.18	0 00:05	5.04	0.10	2.90	0.06	0.17	0.11
23	Link-30	64	Inlet-13	50.00	15.00	14.50	0.50	1.0000	CIRCULAR	12.000	0.0110	0.5000	0.8000	0.00	1.20	0 00:02	4.62	0.18	4.21	0.28	0.37	0.37
24	Link-31	64	Out-01	175.00	7.90	0.00	7.90	4.5100	CIRCULAR	24.000	0.0110	0.5000	0.5000	0.00	33.87	0 00:10	18.96	0.15	57.16	0.59	0.55	1.11

SN	Element ID	Invert Elevation	Boundary Type	Fixed Water Elevation	Peak Inflow	Peak Lateral Inflow	Maximum HGL Depth Attained	Maximum HGL Elevation Attained
		(ft)		(ft)	(cfs)	(cfs)	(ft)	(ft)
1	Out-01	0.00	FIXED	2.00	33.87	0.00	1.11	1.11

SN	Element Description ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation	Max (Rim) Elevation	Initial Water Elevation	Initial Water Depth	Peak Flow	Peak Lateral Inflow
				(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)
1	Inlet-04 CB4	On Sag	1	17.95	24.93	17.95	0.00	4.89	4.89
2	Inlet-06 CB3	On Sag	1	16.55	23.57	16.55	0.00	1.47	1.47
3	Inlet-07 CB2	On Sag	1	15.16	23.51	15.16	0.00	2.19	2.19
4	Inlet-08 CB1	On Sag	1	13.45	26.87	13.45	0.00	0.51	0.51
5	Inlet-09 ProposedSag1	On Sag	1	11.15	15.50	11.15	0.00	3.59	3.59
6	Inlet-10 proposedsag2	On Sag	1	11.15	15.50	11.15	0.00	3.59	3.59
7	Inlet-11 Prop.CB1	On Sag	1	12.90	17.00	12.90	0.00	3.35	3.35
8	Inlet-12 Prop.CB2	On Sag	1	12.90	17.00	12.90	0.00	1.53	1.53
9	Inlet-13 CB8	On Sag	1	0.00	6.00	0.00	0.00	3.35	3.35
10	Inlet-15 CB12	On Sag	1	17.58	23.10	17.58	0.00	3.64	3.64
11	Inlet-16 Cb13	On Sag	1	14.50	18.60	14.50	0.00	0.18	0.18

SN	Description	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Initial Water Depth	Surcharge Elevation	Surcharge Depth	Minimum Pipe Cover	Peak Inflow	Peak Lateral Inflow	Maximum HGL Elevation Attained	Maximum HGL Depth Attained	Maximum Surcharge Depth Attained	Minimum Freeboard Attained
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(inches)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
1	DMH4	15.95	24.04	15.95	0.00	24.04	0.00	71.88	13.40	0.00	17.06	1.11	0.00	6.98
2	DMH3	13.04	23.16	13.04	0.00	23.16	0.00	90.24	23.09	0.00	14.66	1.62	0.00	8.50
3	OCS1	18.20	23.03	18.20	0.00	23.03	0.00	45.96	7.09	7.09	18.64	0.44	0.00	4.39
4	DMH2	12.55	22.81	12.55	0.00	22.81	0.00	91.92	26.51	0.00	14.45	1.90	0.00	8.36
5	DMH1	11.76	23.91	11.76	0.00	23.91	0.00	114.84	26.47	0.00	13.80	2.04	0.00	10.11
6	DMH11	11.30	26.20	11.40	0.10	26.20	0.00	147.60	26.45	0.00	13.44	2.14	0.00	12.76
7	DMH12	9.65	16.20	9.65	0.00	16.20	0.00	30.60	26.50	0.00	13.19	3.54	0.00	3.01
8	DMH16	9.75	17.50	9.75	0.00	17.50	0.00	61.20	7.16	0.00	11.75	2.00	0.00	5.75
9	DMH13	8.88	17.50	8.88	0.00	17.50	0.00	40.20	29.67	0.00	13.48	4.60	0.00	4.02
10	DMH14	8.16	18.50	8.16	0.00	18.50	0.00	43.20	33.88	0.00	14.00	5.84	0.00	4.50
11	DMH15	8.00	15.50	10.00	2.00	15.50	0.00	60.00	33.88	0.00	10.02	2.02	0.00	5.48
12	OCS2	18.20	24.11	18.20	0.00	24.11	0.00	52.92	7.09	7.09	18.94	0.74	0.00	5.17
13	FocalPointOutlet	15.00	19.00	15.00	0.00	19.00	0.00	36.00	1.20	1.20	15.37	0.37	0.00	3.63

SN	Element Description ID	Area	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation	Total Runoff	Peak Runoff	Rainfall Intensity	Time of Concentration
		(acres)			(inches)	(inches)	(cfs)	(inches/hr)	(days hh:mm:ss)
1	Sub-01	1.99	Inlet-13	0.3500	0.80	0.28	3.35	4.813	0 00:10:00
2	Sub-02	0.26	Inlet-12	0.9500	0.52	0.49	1.53	6.200	0 00:05:00
3	Sub-03	1.99	Inlet-11	0.3500	0.80	0.28	3.35	4.813	0 00:10:00
4	Sub-04	0.61	Inlet-09	0.9500	0.52	0.49	3.59	6.200	0 00:05:00
5	Sub-05	0.61	Inlet-10	0.9500	0.52	0.49	3.59	6.200	0 00:05:00
6	Sub-06	2.70	Inlet-15	0.2800	0.80	0.23	3.64	4.813	0 00:10:00
7	Sub-07	0.03	Inlet-16	0.9500	0.52	0.49	0.18	6.200	0 00:05:00
8	Sub-08	0.48	Inlet-08	0.2200	0.80	0.18	0.51	4.813	0 00:10:00
9	Sub-09	1.90	Inlet-07	0.2400	0.80	0.19	2.20	4.813	0 00:10:00
10	Sub-10	1.27	Inlet-06	0.2400	0.80	0.19	1.47	4.813	0 00:10:00
11	Sub-12	2.48	Inlet-04	0.4100	0.80	0.33	4.89	4.813	0 00:10:00

ATTACHMENT F

**Geotechnical Report
Prepared by Summit GeoEngineering**

From: [Bill Peterlein](#)
To: [Griffin Hornyak](#); [Michael Cartoski](#); [Claiborne Williams](#); greg.heppner@smithgroup.com; christine.rancourt@smithgroup.com; [Reaz Haque](#); [Kevin French](#); [Mason Rowell](#); [Michael Parma](#); [Jeff Griffin](#); [Steve Bushey](#); [Ben Dineen](#); [Vin Veroneau](#); [Rich Burke](#); [Celina Daniell](#); bob.vallee@jbbrown.com; kane@jbbrown.com; Adriane.Cody@smithgroup.com; michael.coppola@smithgroup.com; paul.taylor@smithgroup.com; denge.agola@smithgroup.com; syoung@ljbinc.com; [AJ Hodge](#); [Sasha Velic](#); [Ethan Grossman](#); jlutz@ljbinc.com; [Timothy LeGage](#)
Subject: RE: VA Portland - Weekly Team Meeting
Date: Monday, October 28, 2019 1:53:16 PM

Based on the subsurface conditions encountered at the parking garage area and my analyses I will be recommending the following for the proposed garage in my supplemental geotechnical report. Note that these recommendations are similar to the recommendations I forwarded on October 7, 2019.

Foundation Type: Conventional spread footing foundations.

Allowable Bearing Pressure = 3,000 psf. Maximum settlement 1.1 inch. Settlement range 0.4 to 1.1 inches. Total and differential settlements acceptable for steel framed structure.

Required frost protection depth = 4 ft

Subgrade preparation for interior and exterior isolated column footings

1. Excavate the building footprint to 12 inches below the base of the proposed slab.
2. Proofroll entire building footprint using a vibrator compactor having a minimum weight of 10 tons and making a minimum of 4 passes in each of two perpendicular directions. This is intended to densify the existing fill soil.
3. Excavate to 12 inches below the base of the footings. Proofroll the exposed subgrade by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
4. Install a layer of woven geotextile such as Mirafi RS280i on the proof-rolled subgrade soil. Extend the geotextile at least 2 feet beyond the edge of the footing all around.
5. Place a minimum of 12 inches of $\frac{3}{4}$ inch crushed stone directly on the geotextile. Compact the stone with a vibratory plate compactor.
6. Construct the footing directly on the compacted crushed stone. For exterior column footings the crushed stone can be included in the frost protection depth if desired, reducing the minimum depth from the bottom of the footing to the exterior finished grade to 3 feet.

Subgrade preparation for perimeter footings (assume 2 kips/ft linear load):

1. Excavate to the base of the footing (minimum 4 feet frost protection depth).
2. Proofroll the exposed soil by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
3. Construct the footings directly on the proofrolled soil. The use of crushed stone and geotextile is optional.

Other recommendations:

- Perimeter underdrains are not necessary.
- Seismic Site Class D (based on limited SW Cole soil boring data – no borings were carried to refusal so the depth of bedrock is unknown).
- Slab constructed on a minimum of 12 inches of ¾ inch crushed stone placed directly on the proofrolled subgrade soil (no geotextile necessary).
- Base friction coefficient between CIP concrete and crushed stone = 0.60
- Based friction coefficient between CIP concrete and existing soil = 0.40

Hopefully the above info will keep the project moving forward until I can prepare the supplemental report.

Please contact me with any questions or if any additional information is needed.

Bill

Bill Peterlein, P.E.
 President & Principal Engineer
Summit Geoengineering Services
 145 Lisbon Street, Suite 701
 P.O. Box 7216
 Lewiston, ME 04243
 (207) 576-3313

<http://www.summitgeoeng.com/>

From: Griffin Hornyak <ghornyak@fdstonewater.com>

Sent: Wednesday, October 23, 2019 3:33 PM

To: Michael Cartoski <mcartoski@fdstonewater.com>; Claiborne Williams <cwilliams@fdstonewater.com>; greg.heppner@smithgroup.com; christine.rancourt@smithgroup.com; Reaz Haque <Reaz.Haque@smithgroup.com>; Kevin French <kfrench@landryfrenchconstruction.com>; Mason Rowell <mrowell@landryfrenchconstruction.com>; Michael Parma <Michael.Parma@smithgroup.com>; Jeff Griffin <jgriffin@ljbinc.com>; sbushey@gorrillpalmer.com; Ben Dineen <bdineen@fdstonewater.com>; Vin Veroneau <veroneau@jbbrown.com>; Rich Burke <rburke@landryfrenchconstruction.com>; Celina Daniell <cdaniell@gorrillpalmer.com>; bob.vallee@jbbrown.com; kane@jbbrown.com; Adriane Cody <adriane.cody@smithgroup.com>; michael.coppola@smithgroup.com; paul.taylor@smithgroup.com; denge.agola@smithgroup.com; syoung@ljbinc.com; AJ Hodge <AJ.Hodge@smithgroup.com>; Sasha Velic <Sasha.Velic@smithgroup.com>; Ethan Grossman <Ethan.Grossman@smithgroup.com>; jlutz@ljbinc.com; Bill Peterlein <bpeterlein@summitgeoeng.com>; Timothy LeGage <timothy.legage@smithgroup.com>

Subject: RE: VA Portland - Weekly Team Meeting

Please see attached agenda for our weekly meeting tomorrow afternoon.

Thanks,

Griffin Hornyak

FD STONEWATER

T 703.537.7638 | C 330.461.6002 | ghornyak@fdstonewater.com

-----Original Appointment-----

From: Michael Cartoski <mcartoski@fdstonewater.com>

Sent: Thursday, August 29, 2019 4:51 PM

To: Michael Cartoski; Claiborne Williams; greg.heppner@smithgroup.com; christine.rancourt@smithgroup.com; Reaz Haque; Kevin French; Mason Rowell; Michael Parma; Jeff Griffin; sbushey@gorrillpalmer.com; Ben Dineen; Vin Veroneau; Griffin Hornyak; Rich Burke; Celina Daniell; bob.vallee@jbbrown.com; kane@jbbrown.com; Adriane Cody; michael.coppola@smithgroup.com; paul.taylor@smithgroup.com; denge.agola@smithgroup.com; syoung@ljbinc.com; AJ Hodge; Sasha Velic; Ethan Grossman; jlutz@ljbinc.com; Bill Peterlein; Timothy LeGage

Subject: VA Portland - Weekly Team Meeting

When: Occurs every Thursday effective 9/5/2019 until 1/17/2020 from 2:00 PM to 3:00 PM (UTC-05:00) Eastern Time (US & Canada).

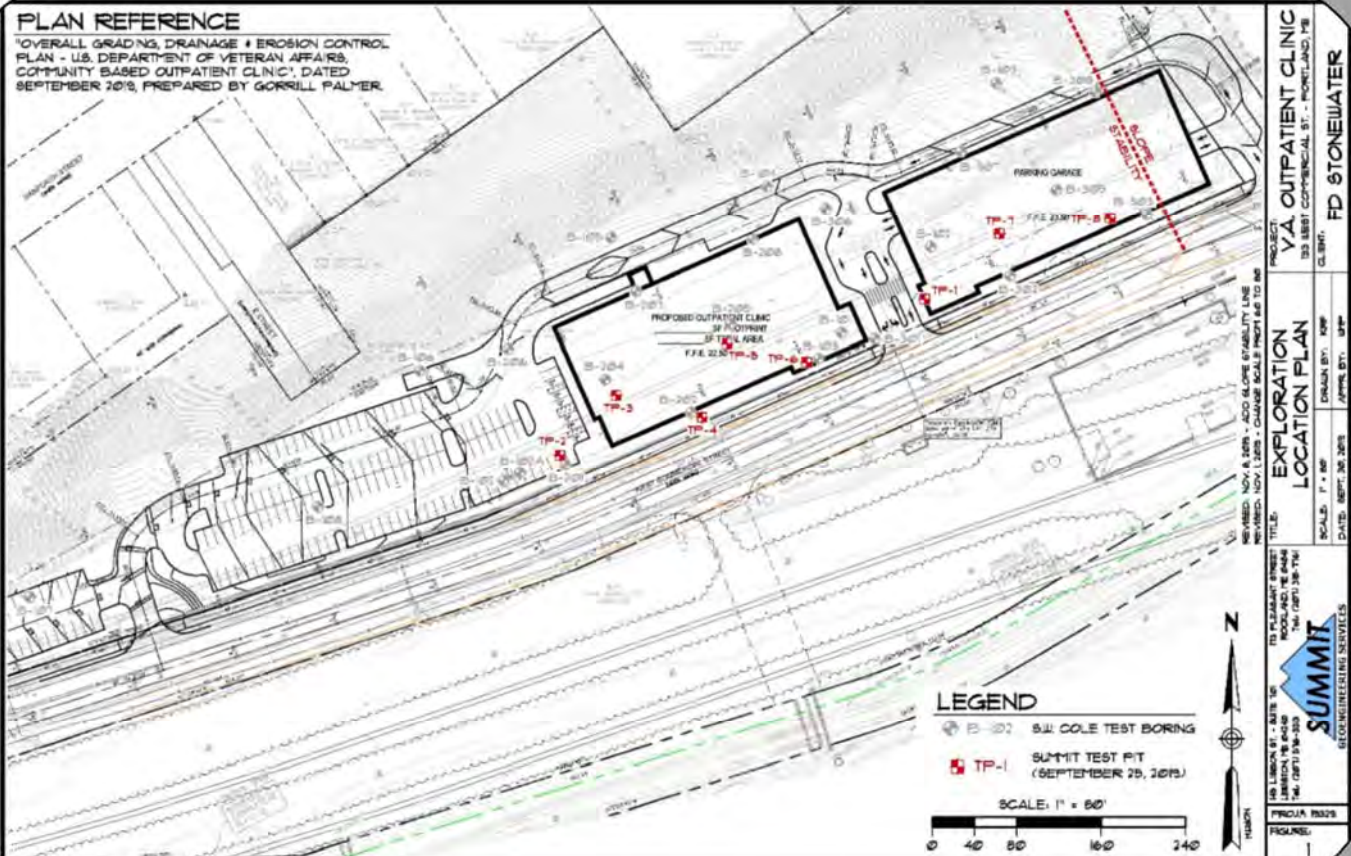
Where: Conference Call: 267-930-4000, Participant ID: 986-960-886

Weekly meeting with the design/construction team for the VA Portland Project.

The key to success starts with a solid foundation.
ENGINEERING | EXPLORATION | EXPERIENCE

Geotechnical Report

New VA COBC and Parking Garage West Commercial Street, Portland, Maine



Client

FDS JBB Portland, LLC
c/o Fd Wtonewater, LLC
1001 19th Street North, Suite 1401
Arlington, VA 22209

145 Lisbon Street (PO Box 7216) Lewiston, Maine 04243 | (207) 576-3313
173 Pleasant Street Rockland, Maine 04841 | (207) 318-7761
www.summitgeoeng.com

Project #: 19329
Date: 11/08/2019

November 8, 2019
Summit #19329

Claiborne Williams
FDS JBB Portland, LLC
c/o FD Stonewater
1001 19th Street North, Suite 1401
Arlington, VA 22209

Reference: Geotechnical Investigation, Proposed VA CBOC and Parking Garage
West Commercial Street, Portland, Maine

Dear Claiborne;

Summit Geoengineering Services, Inc. (SGS) has completed a geotechnical investigation for the proposed VA CBOC and Parking Garage at West Commercial Street in Portland, Maine. Our scope of services included reviewing available information, including a preliminary geotechnical report prepared by S.W. Cole Engineering, observing 8 test pits at the site, performing laboratory tests, and preparing this geotechnical report summarizing our findings and providing geotechnical recommendations for the design and construction of the new building and parking garage foundations.

Our scope of services for this project did not include an environmental site assessment or further investigation for the presence or absence of hazardous or toxic material on, below, or around the site. No hazardous materials were encountered in the test borings completed at the site.

1.0 Project and Site Description

The project consists of the construction of a new 2 story MOB with a footprint of approximately 250 feet by 120 feet and a 2 to 3 story parking garage with a footprint of approximately 280 feet by 120 feet. The MOB will have a slab on grade at or near elevation 22.5 feet. The parking garage will have a pavement or concrete ground surface at or near elevation 23.5 feet. The proposed loads are as follows:

CBOC:	DL = 20 kips to 162 kips LL = 23 kips to 179 kips
3-Story Garage:	DL = 78 kips to 962 kips LL = 20 kips to 471 kips
2-Story Garage:	DL = 55 kips to 675 kips LL = 14 kips to 330 kips

Additional construction includes paved driveways and parking lots and retaining walls.

The existing site is an open field with grass and brush. An abandon rail line is present adjacent to West Commercial Street. The ground surface in the proposed CBOC area is relatively flat ranging in elevation from 22 feet to 24 feet. The ground surface in the southern two-thirds of the proposed parking garage ranges from elevation 22 feet to elevation 25 feet. The grade rises steeply to the north up to elevation 40 feet in the northeast corner of the footprint. Cuts of up to 20 feet will be required to construct the proposed parking garage. The cuts will require retaining walls.

2.0 Subsurface Exploration and Laboratory Testing

2.1 SGS Subsurface Explorations

SGS observed the subsurface conditions with the excavation of 8 test pits on September 25, 2019. The tests pits were excavated to depths ranging from 8 to 13 feet by Shaw Brothers using a tracked excavator under the direction of SGS. The location of the test pits are shown on the Exploration Location Plan in Appendix A. Logs of the test pits are included in Appendix B.

2.2 S.W. Cole Engineering Subsurface Explorations

A total of 7 test borings were completed by S.W. Cole Explorations, LLC in September 2015. An additional 17 test borings were completed at the site in July 2019, also by S.W. Cole Explorations, LLC. The location of the borings are presented on the Exploration Location Plan in Appendix A. Logs of the borings are included in Appendix C.

2.3 Laboratory Testing

A grain size analysis and moisture content test was performed on a sample taken at a depth of 4 to 6 feet at the TP-3 location. The grain size test indicated that the sample contained 15% gravel, 84% sand, and 1% silt. The moisture content was 2.5%. A report of the tests are included in Appendix D.

3.0 Subsurface Conditions

3.1 Soil

The following subsurface layers and thicknesses were encountered in our investigation,

- **Fill**
- **Glaciomarine Fan** (*interbedded sand and gravel with local silty clay drapings*)

The **Fill** was encountered starting at the ground surface and extending to a depth of approximately 3 feet to greater than 13 feet (TP-8 location) below the ground surface. The composition of the fill encountered in the test pits is summarized in the following table.

FILL DESCRIPTION		
Location	Thickness	Description
TP-1	3 ft	Silty sand with thin layer of ash
TP-2	10 ft	Silt with ash (1 ft) over gravelly sand, trace silt, asphalt piece at 6 ft
TP-3	9 ft	Silt with trace ash (1 ft) over sand, little gravel, trace silt
TP-4	8 ft	Silt with trace ash and gravel (1 ft) over gravelly sand, trace silt
TP-5	4 ft	Silt with trace ash and gravel (1 ft) over gravelly sand, trace silt
TP-6	3 ft	Silt with trace ash and gravel (1 ft) over gravelly sand, trace silt
TP-7	10 ft	Sand, little gravel over silty clay mixed with sand, over sandy gravel, little silt trace clay
TP-8	13+ ft	Sand, little gravel over gravelly sand, little silt mixed with clay balls

In general the fill was dry and loose except at the TP-7 and TP-8 locations where it was firm or compact. There were no man-made products or organic material observed in the fill soil. The grain size test at a depth of 4 to 6 feet at the TP-3 location indicated that the sample contained 15% gravel, 84% sand, and 1% silt.

The **Glaciomarine Fan** deposit is generally composed of layers of sand and sand and gravel. Periodic layers of silty clay and clayey silt were encountered (TP-7, B-108, B-202, B-203, B-204, B-205, B-301, B-302, B-304, B-308, B-102) at various depths and thicknesses.

The SPT-N values in the sand and sand and gravel deposits ranged from 7 to 93 and averaged 26 blows per foot. SPT-N values in the silty clay layers ranged from 2 to 21 and averaged 9 blows per foot.

Detailed descriptions of the soil types and stratigraphy are included on the logs in Appendix B and C.

3.2 Bedrock

Refusal was not encountered at the site in the borings or test pits. The deepest boring was drilled to a depth of 40 feet below the existing ground surface (elevation -18 feet).

3.3 Groundwater

Groundwater was observed in the S. W. Cole Engineering borings ranging from elevation 3 feet to elevation 5 feet. Groundwater levels are shallower as the grade rises to the north.

Groundwater levels do fluctuate seasonally and the recorded level may be higher or lower than the actual levels during the construction period. Groundwater levels will generally be lower in the middle of the summer and winter and higher in the spring and fall.

4.0 Geotechnical Evaluation

In general the soil at the site is suitable to support the proposed building and parking garage. The geotechnical challenges are the presence of loose pockets or fill in specific areas, periodic layers of silty clay, the large magnitude of the parking garage loads, and the deep cut at the north and northeast sides of the proposed parking garage.

The pockets of loose fill and silty clay can be densified by proof rolling and local ground improvement such as geotextile and crushed stone can be used to allow for use of conventional spread footings for both structures. The majority of the parking garage loads are dead loads. These loads will cause immediate settlement of the underlying soil. Additional settlement will occur incrementally as additional structure is built. This process will allow for adjustments to be made to the structure as it is built, if necessary, to accommodate small settlements. After the structure is built, the only remaining loads creating settlement will be the live loads.

A global stability analysis was performed on the areas where deep excavation into the ground and retaining walls will be required. In general the cut slopes will be stable. Recommendations for maximum slope steepness and design and construction of the retaining walls are presented in this report.

5.0 Geotechnical Recommendations

5.1 Foundation Bearing Pressure

We anticipate that footings will be constructed on the native glaciomarine fan deposit or existing fill soil. Based on our analyses and assuming that the following guidelines are used, the proposed building and parking garage can be supported on conventional isolated and continuous spread footings proportioned using an allowable bearing pressure of 3,000 psf.

The total settlement at the proposed building associated with this bearing pressure is estimated to range from 0.4 inches to 0.8 inches. The total settlement at the proposed parking garage location is estimated to range from 0.6 inches to 1.2 inches. Differential settlement at both the building and parking garage will be negligible.

5.1.1 Subgrade Preparation Proposed Building. The above allowable bearing pressure and associated settlement are based on the following subgrade preparation recommendations for the CBOC.

- Excavate the building footprint to 12 inches below the base of the proposed slab.

- Proof roll entire building footprint using a vibrator compactor having a minimum weight of 10 tons and making a minimum of 6 passes in each of two perpendicular directions. This is intended to densify the existing fill soil.
- Excavate to the base of the footings. Proof roll the exposed subgrade by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
- Notify SGS to observe the footing subgrade conditions.
- Construct the footing directly on the proof rolled native soil, unless otherwise directed by SGS.

5.1.2 Subgrade Preparation Proposed Parking Garage. The above allowable bearing pressure and associated settlement are based on the following subgrade preparation recommendations for the parking garage.

- Excavate the building footprint to 12 inches below the base of the proposed slab.
- Proof roll entire building footprint using a vibrator compactor having a minimum weight of 10 tons and making a minimum of 4 passes in each of two perpendicular directions. This is intended to densify the existing fill soil.
- Excavate to 12 inches below the base of the footings for a 2-story structure and 24 inches below the base of footings for a 3-story structure. Proof roll the exposed subgrade by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
- Install a layer of woven geotextile such as Mirafi RS280i or approved equivalent on the proof-rolled subgrade soil. Extend the geotextile at least 3 feet beyond the edge of the footing all around.
- Place a minimum of 12 inches (2-story structure) or 24 inches (3-story structure) of $\frac{3}{4}$ inch crushed stone directly on the geotextile. Compact the stone with a vibratory plate compactor.
- Construct the footing directly on the compacted crushed stone. For exterior column footings the crushed stone can be included in the frost protection depth if desired, reducing the minimum depth from the bottom of the footing to the exterior finished grade to 3 feet.

5.2 Frost Protection

The design air freezing index for the Portland area is approximately 1,200 degree F days (10 year, 90% probability). Based on this, a total of 4 feet of frost protection should be provided for the exterior footings. For the parking garage the 12 inches of $\frac{3}{4}$ inch crushed stone can be considered in the total frost protection depth reducing the depth of the bottom of the footing from the exterior finished grade to 3 feet.

We recommend that the exterior of all foundation elements exposed to freezing temperatures can be backfilled with Foundation Backfill (FB). FB shall consist of soil having a maximum particle size of 4 inches and having a maximum of 7% finer than the #200 sieve. FB should be placed in 6 to 12 inch lifts and compacted to 95% of its optimum dry density determined in accordance with ASTM D1557.

We recommend that the backfill on the interior of the foundation walls in heated areas consist of Structural Fill (SF, see Section 5.4).

5.3 Seismic Design

Based on the subsurface data collected in the borings, we recommend Site Class D be used in accordance with the ASCE 7-16 Code. The following seismic site coefficients should be used:

SUBGRADE SITE SEISMIC DESIGN COEFFICIENTS - IBC	
Seismic Coefficient	Site Class D
Short period spectral response (S_s)	0.281
1 second spectral response (S_1)	0.072
Maximum short period spectral response (S_{MS})	0.443
Maximum 1 second spectral response (S_{M1})	0.172
Design short period spectral response (S_{DS})	0.295
Design 1 second spectral response (S_{D1})	0.115

There are no soil conditions at this site that are considered susceptible to liquefaction during seismic events.

5.4 Slabs-on-Grade

We recommend that slabs on grade in heated areas placed on a minimum of 12 inches of Structural Fill (SF, see table below) or $\frac{3}{4}$ " crushed stone (CS). If SF is used, it should be compacted to 95% of ASTM D1557. The subgrade soil beneath the CS or SF should be proof rolled by making a minimum of 6 passes in each of two perpendicular directions using a vibratory roller with a minimum operating weight of 10 tons (see Section 5.1). Soft and loose areas or areas containing demolition debris, organics, and similar unsuitable materials should be removed and replaced with SF or CS.

Where fill is required beneath the SF under the slab, it should consist of FB as described in Section 5.2 above. FB should be placed in 12 inch lifts and be compacted with a minimum of 4 passes in each of two perpendicular directions with a vibratory roller.

We recommend that slabs-on-grade constructed in unheated building areas or exterior slabs be constructed on a minimum of 24 inches of SF or 1 inch of rigid insulation placed over 12 inches of SF.

STRUCTURAL FILL (SF)	
Sieve Size	Percent finer
3 inch	100
$\frac{1}{2}$ inch	35 to 80
$\frac{1}{4}$ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type

CRUSHED STONE ¾ INCH	
Sieve Size	Percent finer
1 inch	100
¾ inch	90 to 100
1/2 inch	20 to 55
3/8 inch	0 to 15
No. 4	0 to 5

Reference: MDOT Specification 703.12, Crushed Stone ¾"

SF have a maximum particle size of 4 inches. SF should be compacted to 95% pf ASTM D1557. CS should be compacted with a vibratory compactor to lock the particles together.

5.4 Asphalt Surfaces

Based on the proposed finish grades within the building footprint, the pavement base soil will be constructed on the existing or imported fill or the glaciomarine fan deposit. The mean annual freezing index for the Portland area is estimated at 900 degree F days. Based on the subgrade soil type and mean annual freezing index, the anticipated mean annual frost penetration depth is 36 inches. Traffic is anticipated to consist of primarily cars and light trucks.

Based on the above, we recommend a minimum total pavement section thickness of approximately 60% of the mean annual frost penetration or approximately 21 inches. We further recommend that the pavement section consist of the following materials.

PAVEMENT SECTION MATERIALS AND THICKNESSES		
Material	Thickness (in)	Specification
Asphalt Binder Course	3	MDOT 703.09, Type 19 mm
Base Soil	3	MDOT 703.06, Type A
Subbase Soil	15	MDOT 703.06, Type D

Where fill is required beneath the subbase soil it should consist of FB as described in Section 5.2 above. We recommend that FB, base soil, and subbase soil be compacted to a minimum of 95% of ASTM D1557.

Based on the subsurface data, pavement underdrains are not necessary at this site.

5.5 Groundwater Control

Based on observed groundwater levels, groundwater ranges from elevation 3 to elevation 5 feet. This is well below the footings and underdrains are therefore not strictly necessary. It is generally good practice to install

perimeter underdrains to account for surface water infiltration and unanticipated changes in local and regional hydrogeology. If perimeter underdrains are used they should consist of 4 inch rigid perforated PVC placed adjacent to the exterior footings and surrounded by a minimum of 6 inches of crushed stone wrapped in filter fabric to prevent clogging from the migration of the fine soil particles in the foundation backfill soils. The underdrain pipe should be outlet to a location where it will be free flowing. Where exposed at the ground surface, the ends of pipes should be screened or otherwise protected from entry and nesting of wildlife, which could cause clogging.

We also recommend exterior grades slope away from the buildings to reduce runoff water from infiltrating the foundation backfill soils.

5.6 Exterior Retaining Walls

We recommend that the segmental block retaining wall be designed by a qualified Maine Licensed P.E.

All topsoil, loose soil, or organic soil should be removed entirely from within the proposed retaining wall footprint prior to construction of leveling pad. We anticipate that the retaining wall will be constructed on existing fill or the native glaciomarine fan deposit. We recommend that the leveling pad consist of a minimum 12" thick layer of $\frac{3}{4}$ " crushed stone. A woven geotextile fabric (such as Mirafi 600X) should be placed beneath the crushed stone. We recommend that the exposed soil beneath the leveling pad be proof rolled prior to placing the crushed stone. Proofrolling should consist of making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons. Any loose, wet, non-mineral, or otherwise unsuitable soil should be removed in its entirety and replaced with $\frac{3}{4}$ " crushed stone prior to installing the leveling pad.

Segmental block retaining walls should be designed in accordance with the National Concrete Masonry Association (NCMA), 3rd Edition design manual. We recommend that the walls be designed using a minimum live load surcharge of 100 psf for construction and for vehicular traffic behind the wall, as applicable.

Retaining wall backfill for gravity retaining walls and reinforced soil for geogrid reinforced retaining walls should consist of Structural Fill (SF, see table below) and be compacted to 95% of its maximum dry density in accordance with ASTM D1557. The portion of SF passing the 3" sieve shall meet the following gradation requirements:

STRUCTURAL FILL (SF)	
Sieve Size	Percent finer
3 inch	100
$\frac{1}{2}$ inch	35 to 80
$\frac{1}{4}$ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type D

The maximum particle size should be limited to 4 inches. Structural Fill should be placed in 12" loose lifts and should be compacted to a minimum of 90 percent of its maximum dry density, determined in accordance with ASTM D1557.

Soil properties presented in the table below can be used in the retaining wall design:

DESIGN PARAMETERS – SEGMENTAL BLOCK WALLS				
Soil Type	Soil Description	Unit Weight	Shear Strength	
			ϕ'	Cohesion
Foundation	Proof rolled Existing Fill or Glaciomarine Fan	125 pcf	32°	0 psf
Retained (Gravity)	Structural Fill (MDOT 703.06, Type D)	135 pcf	34°	0 psf
Reinforced (Geogrid)	Structural Fill (MDOT 703.06, Type D)	135 pcf	34°	0 psf

The selection of parameters used in the wall design are the responsibility of the wall designer.

The retaining walls can be designed using an allowable net bearing pressure of 3,000 psf assuming the recommendations above are followed. Since segmental blocks are tolerable of some differential settlement, the blocks do not need to be constructed to full frost depth.

An underdrain system should be provided continuously behind the retaining wall near its base to prevent the buildup of hydrostatic pressures. The underdrain should consist of 6" rigid perforated PVC surrounded by a minimum of 6 inches of $\frac{3}{4}$ " crushed stone and filter fabric to prevent clogging from the migration of the fine soil particles in the foundation backfill soils. The underdrain should outlet at the ends of the wall, at the low points of the wall, and through the face of the wall at a maximum spacing of 50 ft. center-to-center. Underdrains should outlet to a location where the water will be free flowing and should be protected from nesting animals.

We recommend that a $\frac{3}{4}$ " crushed stone column, with a minimum thickness of 12", be installed behind the entire wall between the back of the concrete and the wall backfill to allow for any infiltrated water behind the wall to drain down to the underdrain pipe. No geotextile is required between the crushed stone and the retaining wall backfill. We recommend that geotextile, such as Mirafi 180N, be installed on the face of the cut slopes between the native soil and the retaining wall backfill.

We recommend that the final wall design be made available for SGS to review prior to construction.

6.0 Earthwork Considerations

6.1 Excavations and Slope Stability

The table below summarizes the OSHA general excavation guidelines for occupied excavations for the soils encountered in our geotechnical explorations.

OSHA Excavation Slopes		
Soil	OSHA Classification	Permissible Slope
Existing Fill	Type C	1.5H:1V
Native Glaciomarine Fan	Type B	1H:1V
Silty Clay	Type B	1H:1V

The above permissible slopes are for soil above the groundwater table. If any excavated soil is found to be below the groundwater table and is not de-watered, the permissible slope for the submerged soil is 1.5H to 1V. Any excavations greater than 20 feet deep should be designed by a qualified Maine Licensed Professional Engineer.

A global stability analysis was performed for static conditions at a deep cut section at the northeast corner of the parking garage. Three conditions were analyzed: Case 1) cut slope with no retaining wall, Case 2) cut slope with geogrid reinforced retaining wall, and Case 3) cut slope with gravity retaining wall. The stability analyses were performed using the SLIDE 2018 computer program and the Spencer method. The results of the analyses are summarized in the table below.

RESULTS OF SLOPE STABILITY ANALYSES	
Condition	Safety Factor
Open Cut Face - 2H:1V	1.55
Gravity Retaining Wall	1.55
Geogrid Reinforced Retaining Wall	1.60

Based on the results of these analyses, the maximum safe permanent grade of open cuts is 2H:1V. Our global stability analyses indicate that both gravity and geogrid reinforced retaining walls will be stable.

6.2 Handling and Reuse of Existing Soil.

Based on the results of the grain size analysis, the vast majority of the existing fill soil will meet the requirements for FB but will not meet the requirements for SF. A grain size analysis was not performed on the glaciomarine fan deposit. We anticipate that the majority of this deposit will also be usable as FB. We recommend that grain size analyses be performed on representative samples of the existing soil at the site to confirm compliance to the specifications in this report prior to their use.

SGS did not perform an environmental assessment on the existing fill soil. We did not observe contaminated soils with the exception of a thin layer of ash at or near the existing ground surface. Where possible we recommend that excess fill be used at the site. SGS can work with the Contractor and Owner to find potential places to use these materials on site, depending on their characteristics. Requirements for handling of contaminated soil should be determined by a qualified environmental consultant.

6.3 Earthwork Monitoring.

SGS should be notified so that we can make observations of the footing subgrade soil (existing fill) for both the CBOC and parking garage buildings prior to the placement of footing or geotextile and crushed stone.

We recommend that a qualified geotechnical consultant be retained to monitor and test soil materials used during construction and confirm that soil conditions and construction methods are consistent with this report.

7.0 Closure

Our recommendations are based on professional judgment and generally accepted principles of geotechnical engineering and project information provided by others. Some changes in subsurface conditions from those presented in this report may occur. Should these conditions or the proposed development differ from those described in this report, SGS should be notified so that we can re-evaluate our recommendations.

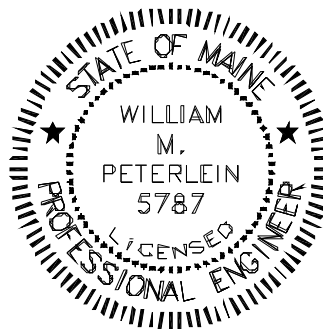
It is recommended that this report be made available in its entirety to contractors for informational purposes and be incorporated in the construction Contract Documents.

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

Sincerely yours,
Summit Geoengineering Services, Inc.



William M. Peterlein, PE
President & Principal Engineer

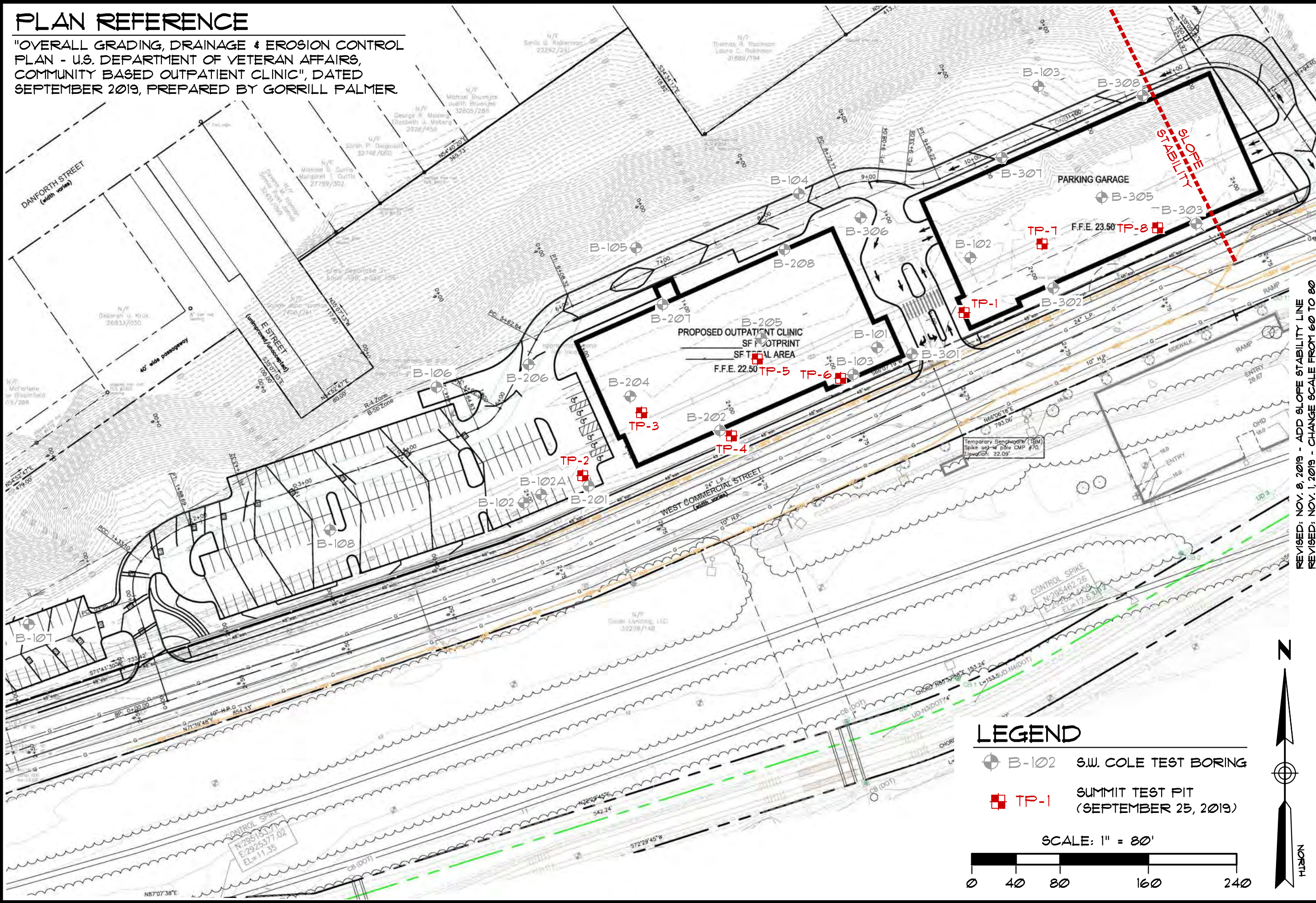


APPENDIX A

EXPLORATION LOCATION PLAN

PLAN REFERENCE

"OVERALL GRADING, DRAINAGE & EROSION CONTROL
PLAN - U.S. DEPARTMENT OF VETERAN AFFAIRS,
COMMUNITY BASED OUTPATIENT CLINIC", DATED
SEPTEMBER 2019, PREPARED BY GORRILL PALMER



APPENDIX B

SGS EXPLORATION LOGS



TEST PIT LOG

Test Pit # **TP-1**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 21.5 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1 _	Brown Silty SAND, trace Gravel, thin layer of ash, dry, loose, SM	FILL
2 _		
3 _		
4 _	Brown SAND, little Gravel, trace Silt, moist, compact, SP	NATIVE GLACIOMARINE FAN
5 _		
6 _		
7 _	Olive-gray to olive-brown fine Sandy SILT, trace Clay, blocky, damp, slightly mottled, firm, ML	
8 _		
9 _	End of Test Pit at 8 ft	
10 _		
11 _		
12 _		
13 _		
14 _		
15 _		
16 _		
17 _		



TEST PIT LOG

Test Pit # **TP-2**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 23 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT mixed with ash, dry, loose, ML	TOPSOIL
2	Brown Gravelly SAND, trace Silt, dry, loose, SP Becomes moist at 3 ft Isolated asphalt piece at 6 ft	FILL
3		
4		
5		
6		
7		
8		
9		
10		
11	Brown medium to fine SAND, trace Silt, moist, loose to compact, SP	NATIVE GLACIOMARINE FAN
12		
13	End of Test Pit at 12 ft	
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-3**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22.5 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Brown SAND, little Gravel, trace Silt, dry to moist, loose, SP 15% Gravel, 84% Sand, 1% Silt	FILL
3		
4		
5		
6		
7		
8		
9		
10	Gray Silty SAND, trace Clay, wet, firm, SM	NATIVE GLACIOMARINE FAN
11	End of Test Pit at 10 ft	
12		
13		
14		
15		
16		
17		

		TEST PIT LOG		Test Pit # TP-4
		Project: Veterans Outpatient Clinic 133 West Commercial St Portland, Maine		Project #: 19329
				Groundwater: None Observed
Contractor: Shaw Brothers		Ground Surface Elevation: 21.5 ft+/-		
Equipment: CAT Large Tracked Excavator		Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19		
Summit Staff: B. Peterlein, P.E.		Date: 9/25/2019	Weather: Sunny	
Depth (ft)	DESCRIPTION			
	ENGINEERING		GEOLOGIC/GENERAL	
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML		TOPSOIL	
2	Brown Gravelly SAND, trace Silt, dry, loose, SP		FILL	
3				
4				
5				
6				
7				
8				
9	Olive-brown medium to fine SAND, trace Silt, moist, compact, SP		NATIVE GLACIOMARINE FAN	
10	End of Test Pit at 10 ft			
11				
12				
13				
14				
15				
16				
17				



TEST PIT LOG

Test Pit # **TP-5**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION		
	ENGINEERING	GEOLOGIC/GENERAL	
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL	
2	Brown Gravelly SAND, trace Silt, dry, loose, SP	FILL	
3			
4			
5	Brown medium to fine SAND, trace Silt, moist, compact, SP	NATIVE GLACIOMARINE FAN	
6			
7	Olive-gray medium to fine SAND, trace Silt, trace Clay, moist, compact, SM		
8			
9	End of Test Pit at 8 ft		
10			
11			
12			
13			
14			
15			
16			
17			



TEST PIT LOG

Test Pit # **TP-6**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 21 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Dark brown Gravelly SAND, trace Silt, dry, loose, SP	FILL
3		
4	Brown medium to fine SAND, trace Gravel and Silt, moist, loose, SP	NATIVE GLACIOMARINE FAN
5		
6		
7		
8		
9		
10		
11	End of Test Pit at 10 ft	
12		
13		
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-7**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Brown slightly mottled SAND, little Gravel, trace Silt, dry, loose, SP	FILL
3	Gray Clayey SILT to Silty CLAY mixed with Sand, little Gravel, moist, firm, ML	
4		
5		
6		
7	Brown Sandy GRAVEL, little Silt, trace Clay, few Clay balls, damp, compact, SM	
8		
9		
10		
11	Brown Gravelly SAND, trace Silt, wet, compact, SP	NATIVE GLACIOMARINE FAN
12	End of Test Pit at 12 ft	
13		
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-8**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Brown to black SILT, little SAND, trace Gravel mixed with black ash, dry, loose, ML	FILL
2	Brown Silghtly mottled SAND, little Gravel, trace Silt, moist, SP	
3		
4	Brown Gravelly SAND, little Silt mixed with clay balls, compact, SM	
5		
6		
7		
8		
9		
10		
11		
12		
13		
14	End of Test Pit at 13 ft	
15		
16		
17		

APPENDIX C

S.W. COLE ENGINEERING EXPLORATION LOGS



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄLCÄV/N, VÄ>4ÄT 2 0-ÄÄ 2 G
LOCATION: W67ÄV/3 = 62R 1B26E 32E 14@Ä

BORING NO.: B-201
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !)S* LOGGED BY: MÄ Ä3H6
DRILLING CO.: BÄVÄ36ÄRR82/B>?@ÄV DRILLER: V32HÄV<110S DRILLING METHOD: J 31BÄÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9/Ä> SAMPLER: BÄ >4/24ÄBRÄBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä3 * ÄÄÄ26ÄÄ B2ÄEÄ K

GENERAL NOTES:

KEY TO NOTES: W/ CEÄÄ96!! ÄÜBRÄEÄ33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä9@GEJ W, -ÄÜW6GJEÄÄ34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3I 62H6>GÄ W, ÄÄÄV6GJEÄÄ3Ä/ = 62 \,ÄÄY>B>064ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/326ÄB = R6 -Ä ÄÜÄ3F [Ä </10Ä6? G>/E3 ÄÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE6ZÄÄG LÄÄ+08ÄL>6ÄBJ6/2 = R6ÄJ0<E6Ä62Ä3E T8ÄÄTJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EÄÄRÄ/516

P6I S 7OE:	6 R6 7OE:	V/? 0-G T6>S 7RO:	BC;T 9PÄD+, - ;C M8 D				a2IRJÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ B>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	M8	6 R6 7OE:	T6>\$ -6 FS 79:				
!* (Ä(Ä* Ä* Ä((!* * !(			Ä	!#	!#\$Ä)	""!"		a 2 ??Ä\$Ä9?6@Ä3A>Ä?HÄBD Ä789:		
			!	()	!#\$!!	""#Z#		"S" 933?6@Ä5[ÄF3 1CB]Ä7+89: ; 640<= Ä6>?6ÄEÄ3?6@Ä3A>Ä?HÄBD @ BZF 6Ä2I 61Ä2 F6Ä1HÄ+89:		
			"	Ä**Ä!	!#\$Ä#	(('))		(S% ; 640<= Ä6>?6Ä23A>Ä2I 61HÄCD @ZF 6 ?0ÄE89:		
			#	Ä('Ä)	!#\$Ä)	&'&'')		%S ; 640<= Ä6>?6@ÄHÄCD @ÄEÄ2I 61		
			Z	!(!)	!#\$!#	Z('Ä* Ä#		Ä)S ; 640<= Ä6>?6Ä23A>G2HÄCD @2/F6 GZ 16ÄÄÄÄ02<6>EÄHÄF#Ä?6= ?ÄY 2532 N3EÄ8: ZÄBÄÄ 326J36Ä5/ >43>64ÄÄK		

N3EÄ8ÄÄQR82 B>ÄEÄÄSÄCÄE

BÄ E00 E3>Ä06?ÄQR268>EÄRR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE208>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄFE64S
+ÄFE</E3>?Ä30Ä8S>4Ä/E62Ä#Ä3F<2Ä4<6Ä8E
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE06
= 6/? <6= 6>EÄ626Ä=46S

BORING NO.: B-201

N, -8Da $\tilde{A}\tilde{P}\tilde{0}\tilde{9}\tilde{A}\tilde{A}^*\&\#!\tilde{S}\tilde{A}\tilde{S}\tilde{a}\tilde{T}\tilde{c}\tilde{A}\tilde{A}\tilde{V}\tilde{V}\tilde{P}\tilde{A}\tilde{M}\tilde{A}\tilde{A})\tilde{S}\tilde{S}\tilde{A}\tilde{A}$



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄLCÄ/V, VÄ>4ÄT 2 0-ÇÄd 2 Ç
LOCATION: W67EÄV3= 62R 1B26EÄ 32E 14@Ä

BORING NO.: **B-204**
SHEET: ÄÄÇÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä%8 *Ä&
DATE FINISH:)\$Ä%8 *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): IZS* LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ Ä<G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9Ä> SAMPLER: BE>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$ÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä8 * Ä&Ä26ÄÄ B2ÄEÄK

GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: W/ E62Ä96!! ÄUÄRTÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä96GEJ W, -ÄUÄW6GJEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄF3I 62Ä6>GÄ W, ÄUÄV6GJEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄÄBA?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3Ä ÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄÄG LÄÄ+08ÄL>6ÄB6/2 = ROÄÄÄ<E6Ä62Ä3E T8ÄUÄTJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EÄÄRÄF516

P6I S 7OE:	6 R6 7OE:	V/? 0-G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D					a2/R JÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ B>	J,* 6REJ	- 6= / 2[?	
			B/ = R6 D3S	M8	6 R6 7OE:	T6>\$ -6 FS 79:	N8A V3<>E 32 Ä					+0614Ä\$Ä9 M6?EÄ Æ
!* (Ä(Ä* Ä* Ä((!* * !(			Ä	⊗	!#	!#\$Ä	#('Z		a 2 ??Ä\$Ä23/ 4ÄH24			
			!	⊗	(')	!#\$Ä	##""#		!S*			933?6@ÄB CD @ÄB2P0ÄÄBÄFF/?C>/ 1 GZHÄ1H6HÄ8MÄ6= ?
			"	⊗	Ä**Ä!	!#\$Ä%	Ä**## Ä)		(S*			933?6@ÄB24ÄB/BCD @ÄB2P0Ä>4 3106'GZHÄ1H6HÄ8M
			#	⊗	Ä('Ä)	!#\$Ä	Ä**ÄZ' !Z'!)		Ä(S*			6 >?6@ÄBÄ>ÄBCD @Ä?86ÄZ I 6@ÄB2P0E
			(	⊗	!*!!	!#\$Ä&	Ä('Ä%' !#!Ä					
			Z	⊗	!(IZ	Ä!\$Ä!	&!*		ÄÄ5BÄÄ>@5/ >43>64Ä32J36ÄEÄZK			

BÄ E00 E3>Ä06?ÄR268>EÄR230E/E6
53<>4/ 2Ä56E86>Ä20ÄB6?@ÄE20B>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄFE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#ÄÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE06
= 6/? <B= 6>EÄ62Ä=46S

BORING NO.: **B-204**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?6ÄICÄV/N, VÄ>4ÄT 2 0-CA 2 G
LOCATION: W67ÄV3= = 62R 1326E 32E 14@Ä

BORING NO.: B-205
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#1SÄ
DATE START:)\$Ä%8 *Ä&
DATE FINISH:)\$Ä%8 *Ä&

Drilling Information

LOCATION: B66ÄQR82 B3>Ä3F/ E3>Ä1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !!S* LOGGED BY: M0 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B3>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄE6 ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ\$Ä> SAMPLER: BE >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄCÄÄ \$Ä8 * Ä&Ä26ÄÄ B2ÄEÄK

GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä9@GEJ W, ÄUÄW6GJEÄ9Ä-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
V CEÄE6Ä3CÄÄG YÄÄÄUÄW164ÄM56ÄB = R6 -6F SÄÄ6F31 62H6>GE W, ÄUÄV6GJEÄ9Ä)/= 62 \,ÄÄY>B>O64ÄV3=R6?706ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄUÄBÄ?ÄR62Ä3E -Ä ÄUÄ3F [Ä <10Ä6? G>/E3 ÄÄ-2FE3>ÄG6Ä7P6 /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄBJ6/2 = ROÄUÄ0<E6Ä62Ä3E T8ÄUÄTJ3E33>0/E3>Ä 6E6B2 D\$CÄÄ3EÄRÄF/516

P6I S 7OE:		6 R6 7OE:		V/? 0-G T6>S 7RO:		BC;T 9PÄD+, - ;C M8 D				a2IRJÜÄ9G		B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
						B/ = R6 D3S	MIR6	6 R6 7OE:	T6>S -6 FS 70:	N8A V3<>E 32 ^	+08HÄ\$Ä9 M6?EÄ Ä						
!* (Ä(Ä* Ä* Ä((!* *						Ä	Ä	!#	!#\$(	ZZ('Z		a 2 ??Ä\$ÄC3/ 4ÄH24					
						!	!	()	!#\$(	####		!S* ; 640= Ä6>?6@ÄÄCD @ÄB2ÄCE					
						"	"	Ä**Ä!	!#\$(	##('"		!S% a 2 HÄ?>4HÄBDM					
						#	#	Ä(Ä)	!#\$(	ÄÄ'Ä!'		933?6@Ä26 4ÄE/BCD @ÄB2ÄCÄ>4ÄZ H					
								!#!	!#\$(	('!&'		?/ >4HÄB3MÄBÄF3556?ÄÄK					
												&S 933?6@Ä2 HÄ1H6HÄB89MÄ3= 6Ä/ >4					
												Ä(S ; 640= Ä6>?6@Ä H626Ä523Ä>ÄCD @Ä3= 6					
												G2I 6Ä>4ÄG2HÄ1 H6HÄB3MÄ2 F6Ä/ >4					
												!S* L62HÄ6>?6@Ä23Ä>ÄCD @Ä3= 6ÄZ1 61Ä2F 6					
												201E					

ÄÄBÄÄ@5/ >43>64Ä32J36ÄEÄ! K
N3EE8ÄOÄR82 B3>ÄEÄ!SÄCÄE

BÄE E00 E3>Ä06?ÄQR268>EÄRR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20E>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ÄFE</E3>?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE06
= 6/? <Ä= 6>EÄ62Ä=46S

BORING NO.: B-205



BORING LOG

CLIENT: + B&NNA321 >4@9V
PROJECT: T2R3?64ÄLCÄV/N, VÄ>4ÄT 2 0 CÄd 2 G
LOCATION: W67EÄV3= = 62R0 ÄB26EÄ 32E 14@ÄP

BORING NO.: **B-206**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *#&#ISÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄPQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !"KÄ\$ TOTAL DEPTH (FT): "IS* LOGGED BY: M0 ÄN3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#A0\$ÄÄ\$Ä> SAMPLER: BE>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$ÄZ\$ *Ä&ÄD3Ä6Ä/E62Ä5762 64

GENERAL NOTES:

KEY TO NOTES: W/ E2Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B0Ä90GEJ W, -ÄUÄW6GJEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄD-G YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄF3I 62H06>GÄ W, ÄUÄV6GJEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄF [Ä/32ÄB = R6 5ROÄÄBA?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3 ÄÄ-2FE3>ÄG G6Ä7PÄ /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄB6/2 = ROÄUJ0<E6Ä62Ä3E T8ÄUÄTJ3E3>0/E0>Ä 6E6B2 D\$CÄD3EÄR0F/516

P6I S 7OE:		6 R6 7OE:		V/7 0-G T6>S ÄRO:		BC;T 9PÄD+, - ;C M8 D				B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
						B/ = R6 D3S	M8	6 R6 7OE:	T6>S -6 FS 70:	N8A V3<>E 32 Ä	+08HÄ\$Ä9 M6?EÄ Ä	a2IRJ0Ä9G			
!"		Ä		!"		!"	!"	!"	!"	!"	!"	a 2 ??Ä\$Ä40= Ä6>?6@ÄÄ>ÄG 16 1H BCD @ÄBÄTÄ739:			
(		!		(!		!"	!"	!"	!"	!"	!"	"S" 6 >?6ÄE3-640= Ä6>?6@ÄÄ>ÄG 16 1H BCD @ÄBÄTÄ739: ÄÄ 1Ä?Ä?6= ?ÄÄ1@ F3556?Ä)&K			
Ä(		"		Ä**Ä!		!"	!"	!"	!"	!"	!"	ÄÄÄ ; 640= Ä6>?6@Ä16' G2HÄ0EÄBCD @3= 6 G2I 6ÄM89:			
Ä*		#		Ä(Ä)		!"	!"	!"	!"	!"	!"	Ä(S" 933?6ÄE3-640= Ä6>?6@ÄÄ>ÄG 16 1H BCD @ÄBÄTÄ739: ÄÄ 1Ä?Ä?6= ?ÄÄ1@ G2I 61			
(		!"		!"		!"	!"	!"	!"	!"	!"				
!"		!"		!"		!"	!"	!"	!"	!"	!"				
*		!"		!"		!"	!"	!"	!"	!"	!"				
!(		Z		!(!)		!"	!"	!"	!"	!"	!"				
'		"		!"		!"	!"	!"	!"	!"	!"				
						!"	!"	!"	!"	!"	!"				

N3EESÄ0ÄR82 B>ÄEÄ" SÄCÄE

BÄ E00 E3>Ä06?ÄR268>EÄR230/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE208>?Ä=H
56ÄG2/4</SÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä<>462ÄB>4E3>?ÄE64S
+ÄFE</E3>?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄR268>EÄEÄEÄE06
= 6/7 <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-206**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄICÄ/V, VÄ>4ÄT 1 0-ÇÄ 2 Ç
LOCATION: W67ÄV3= 62R 1B26E 32E 14@Ä

BORING NO.: **B-207**
SHEET: ÄÄÇÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !"KÄ\$ TOTAL DEPTH (FT): !!S * LOGGED BY: M 0 Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄ<1106 DRILLING METHOD: J 31BAÄE 6 Ä<G62
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#A0\$ÄÄ 9Ä> SAMPLER: BE >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄ\$ ÄÄÄ\$ ÄÄÄ\$ * ÄÄÄ26ÄÄ B2ÄEÄ\$ K

GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄU6>6E2/B9Ä96GEJ W, -ÄUÄW6GJEÄÄ34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
V CEÄE6Ä3CÄÄG YÄÄUÄW164ÄM56ÄB = R6 -6F SÄÄF3I 62Ä6>GÄ W, ÄUÄW6GJEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄUÄBÄ?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3 ÄÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄÄG LÄÄ+08ÄL>6ÄBJ6/2 = ROÄUÄ0<E6Ä62Ä3E T8ÄUÄJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EÄÄR/516

P6I S 7OE:		6 R6 7OE:		V/? 0-G T6>S 5RO:		BC;T 9PÄD+, - ;C M8 D				a2/RJÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??0F/ B>		1,* 6REJ	- 6= / 2[?
						B/ = R6 D3S	M8	6 R6 7OE:	T6>S -6 FS 70:		N8A V3<>E 32 _^	+0614Ä\$Ä9 M6?EÄ Æ		
!*				Ä	⊗	!#	!#\$Ä	Ä!'(' &	- / 0PÄ0-GÄS3?6@Ä6 GZ HÄ?HÄBD ÄÄB E>ÄCD ÄH62Ä7B9:					
(				!	⊗	()	!#\$ÄZ	ÄZ'Ä(' Ä('!!	"S" 6>76 23A>ÄCD Ä>4Ä - CLP9ÄÄB F3556?					
Ä(				"	⊗	Ä**Ä!	!#\$Ä	Ä&'Ä%' !!!"						
Ä*				#	⊗	Ä('Ä)	!#\$Ä&	!!'!" Ä&'***						
(				(	⊗	!***	!#\$Ä	ÄZ'Ä' !**!Ä						
!														

N3EE3ÄÄQR82 B>ÄEÄ!SÄCÄE

BÄE E09 E3>Ä06?ÄQR268>EÄRR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20B>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62ÄHÄ3F<2Ä4<6ÄB
3EJ62ÄCÄ2?ÄJ/>ÄJ3 6ÄR268>EÄEÄEÄE0
= 6/? <B= 6>EÄ62Ä=46S

BORING NO.: **B-207**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?64ÄICÄV/N, VÄ>4ÄT 2 0-ÖÄd 2 G
LOCATION: W67EÄV3 = 62R ÄB26EÄ 32E 14@Ä

BORING NO.: **B-208**
SHEET: ÄÄÖÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !#KÄ\$ TOTAL DEPTH (FT): Ä" S LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ Ä<G62
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ\$Ä> SAMPLER: BÄ >4/24ÄBTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$ÄZ\$ *Ä&ÄD3Ä6Ä/E62Ä5?62 64

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄUÄBTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä9GÄJ W, -ÄUÄW6GÄEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄUÄÄW164ÄM56ÄB = R6 -6F SÄÄF3! 62Ä6>GÄ W, ÄUÄV6GÄEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄUÄBÄ?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3Ä ÄÄ-2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD>G LÄÄ+08ÄL>6ÄB6/2 = ROÄUÄ0<E6Ä62Ä3E T8ÄUÄT J3E3>0/E3>Ä 6E6B2 D\$CÄD3EÄBÄF/516

P6! S 7OE:	6 R6 7OE:	V/? 0-G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D					a2/R JÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??0F/ B>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	MIR6	6 R6 7OE:	T6>S -6 FS 79:	N8A V3<>E 32 -Ä				
!*	(	Ä(	Ä	!#	!#SÄ%	!(Ä' Ä(			-/ 02/ 4Ä20>GÄ\$640= Ä6>?6@ÄGÄ?4H B8MÄ?89:		
			!	(	!#SÄ)	)'Ä! Ä('!!		"S	; 640= Ä6>?6ÄE36>?6@ÄE2 161HÄCD @ E F6Ä0EÄBÄ26<6>E3556?		
			"	Ä*S' ÄÄ%	ÄÄ&	!* (*\$(.					

Ä-6G?/ ÄEÄÄÄÄ
T235/5 6Ä3<462

BÄ E00 E3>Ä06?ÄBR268>EÄR230E/E6
53<>4/ 2Ä56E86>Ä20ÄB6?@ÄE208>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62Ä082?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE06
= 6/? <26= 6>EÄ62Ä=46S

BORING NO.: **B-208**

N, -8Da $\tilde{A}\tilde{S}\tilde{A}\tilde{P}\tilde{O}\tilde{9}\tilde{A}\tilde{A}^* \& \# \tilde{!}\tilde{S}\tilde{A}\tilde{S}\tilde{a}\tilde{T}\tilde{c}\tilde{A}\tilde{A}\tilde{V}\tilde{P}\tilde{A}\tilde{M}\tilde{P}\tilde{;}\tilde{T}\tilde{9}\tilde{C}\tilde{M}\tilde{P}\tilde{S}\tilde{a}\tilde{M}\tilde{A}\tilde{A}\tilde{S}\tilde{S}\tilde{A}\tilde{\&}$



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?6ÄICÄV/N, VÄ>4ÄT 1 0-CÄd 2 G
LOCATION: W67EÄV3= 62R 13E26EÄ 32E 14@Ä

BORING NO.: **B-303**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#ISÄ
DATE START:)\$Ä&\$ *Ä&
DATE FINISH:)\$Ä&\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !*S* LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄ<1106 DRILLING METHOD: J 31BAÄEÄ ÄC-G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#A0\$ÄÄ 9/Ä> SAMPLER: BE >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä\$ * ÄÄÄ26ÄÄ B2ÄEÄK

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä9@GEJ W, ÄUÄW6GJEÄÄ-34? B,ÄÄ+08ÄÄ >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄD-G YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄF3I 62Ä6>GÄ W, ÄUÄV6GJEÄÄÄ/!= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄÄBÄ?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3 ÄÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD-G LÄÄ+08ÄÄ >6ÄB6/2 = ROÄÄÄ<E6Ä62Ä3E T8ÄUÄTJ3E33>0/E3>Ä 6E6B2 D\$CÄÄ3EÄÄRÄF/516

P6I S 7OE:		6 R6 7OE:	V/? 0-G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D				a2/RJÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??0F/ B>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	M8	6 R6 7OE:	T6>S -6 FS 79:	N8A V3<>E 32 _ ^	+014Ä\$Ä9 M6?EÄ E			
!* (Ä(Ä* Ä* Ä((!* (			Ä	⊗	!#	!#\$Ä&	""##"		a2/I 6103EÄ+89:		
			!	()	!#\$Ä&	Ä""')%	IS* 933?6ÄH6264Ä106'523A>Ä1H6HÄ89MÄ> 4 EÄ 2<?EÄ3A>ÄED				
			"	Ä**Ä!	!#\$Ä&	#%'%'&	%S ; 640= Ä6>?6@ÄÄÄCD @ÄBÄPÄÄÄÄ CÄ<6 >Ä3556?				
			#	Ä('Ä)	!#\$Ä&	('Ä** Ä""Ä(					
ÄÄBÄÄÄÄ5/ >43>64Ä32J36ÄÄÄ *K N3EE8ÄOÄR82 B>ÄEÄ1\$ÄCÄE											

BÄ E09 E3>Ä06?ÄQR268>EÄRR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE2ÄB>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä3OÄS>4Ä/E62Ä#ÄÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE06
= 6/? <Ä= 6>EÄ62ÄÄ=46S

BORING NO.: **B-303**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄLCÄV/N, VÄ>4ÄT 1 0 CÄd 2 G
LOCATION: W67ÄV3 = 62R Ä26EÄ 32E 14@Ä

BORING NO.: **B-304**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä%Ä *Ä&
DATE FINISH:)\$Ä%Ä *Ä&

Drilling Information

LOCATION: B66ÄQR82 EÄ>Ä3F/ EÄ>Ä1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !!S * LOGGED BY: MÄ Ä3H6
DRILLING CO.: BÄVÄ36ÄRR82/EÄ>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BÄÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>E4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9Ä> SAMPLER: BE>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄÄÄÄÄ * ÄÄÄÄÄÄÄÄÄÄ EÄÄÄÄÄÄÄÄÄÄÄ:
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: W/ E6Ä96!! ÄÜBRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä96GEJ W, -ÄÜÄV6GJEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄF3I 62Ä6>GÄ W, ÄÄÄV6GJEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/32ÄB = R6 5ROÄÄBÄ?ÄR62Ä3E -Ä ÄÜÄ3F [Ä </10Ä6? G>/E3Ä ÄÄZFE>ÄG G6Ä7PÄ /E64:
V COE6ZÄD-G LÄÄ+08ÄL>6ÄBJ6/2 = ROÄJ0><E6Ä62Ä3E T8ÄÄT J3E3D>0/EQ>Ä 6E6E2 D\$CÄÄ3EÄÄÄÄ/516

P6I S 7OE:	6 R6 7OE:	V/? 0-G T6>S 7RO:	BC;T 9PÄD+, - ;C M8 D					a2/RJ0Ä9G	B/ = R6 6?F2FE>Äb V1 ??0F/ E>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	M8E	6 R6 7OE:	T6>S -6 FS 79:	N8A V3<>E 32 ^				
!* (Ä(Ä* Ä* Ä((!* *			Ä	⊗	!#	!#SÄ	(#!"Ä	IS(B6D@Ä523A>Ä0EÄV9d "S B3OE@ÄF161ÄBMAEÄ?Ä1? #S ; 640= Ä6>76@ÄG151FÄBCD ÄÄEÄG 16 1 1 H626ÄÄEÄ2/HÄ1 H6H88M			
			!	⊗	()	!#SÄ(	#"Ä" Ä!				
			"	⊗	Ä**Ä!	!#SÄ!	!"Ä" Ä!				
			#	⊗	Ä(ÄZ	Ä!\$)	Ä*(*				
						(	!***	!#SÄ	%"%'!' "Ä	!H6BAÄ@5/ >43>64Ä32J36ÄEÄ! K	▽

N3EESÄOÄR82 EÄ>ÄEÄ!SÄCÄE

BÄ E0Ä EÄ>Ä06?ÄQR26E>EÄR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20E>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4EÄ>?ÄE64S
+ÄFE</EÄ>?Ä30ÄS>4Ä/E62Ä#ÄÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR26E>EÄEÄEÄE6
= 6/? <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-304**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄÄCÄ/V, VÄ>4ÄT 2 0 CÄd 2 G
LOCATION: W67ÄV3= 62R 1326E 32E 14@Ä

BORING NO.: **B-305**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä%8 *Ä&
DATE FINISH:)\$Ä%8 *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): ÄZS LOGGED BY: M8 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄ<1106 DRILLING METHOD: J 31BAÄE6 Ä<G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9/Ä> SAMPLER: BE >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$Ä%8 *Ä&ÄD36Ä/E62Ä5762 64

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä96GEJ W, -ÄUÄV6GJEÄ3Ä-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄW164ÄM56ÄB = R6 -6F SÄÄ6F3I 62H6>GÄ W, ÄUÄV6GJEÄ3Ä)/= 62 \,ÄÄY>B>064ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄÄBA?ÄR62Ä3E -Ä ÄUÄ3F [Ä <10Ä6? G>/E3Ä ÄÄ-2FE3>ÄG6Ä7P6 /E64:
V COE62ÄÄG LÄÄ+08ÄL>6ÄBJ6/2 = ROÄÄJ0<E6Ä62Ä3E T8ÄUÄJ3E33>0/E0>Ä 6E6B2 D\$CÄD3EÄR7/516

P6I S 7OE:	6 R6 7OE:	V/? 0G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D					a2/R J0Ä9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ B>	J,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	MIR6	6 R6 7OE:	T6>S -6 FS 70:	N8A V3<>E 32 _Ä				
!*			Ä	!#	!#SÄ(	(ÄÄ('	#		N2A>ÄBCD @3= 6Ä2I 61		
(			!	(	!#SÄ&	Z#"%'%			IS(; 640= Ä6>?6@ H62HÄG2HÄR0EÄBCD Ä>4 GÄ HÄF7H0HÄBM@Ä?6Ä?>4		
Ä(			"	Ä**Ä!	!#S!#	)!Z'	"!#!		Ä*S / N1 FÄ?/>4HÄBM@21FÄ3G >FÄR2E8G Ä*S/ L62HÄ6?76@ÄÄBCD @Ä?6Ä3 I 6ÄÄE 06\<6 >EÄ355 6?		
Ä*			#	Ä(Ä(S"	#S	(*S#.					

Ä-6G?/ ÄEÄS ÄCÄE
T25/5 6Ä3<#62

BÄE E00 E3>Ä06?ÄQR268>EÄRR230/E6
53<>4/ 2Ä56E86>Ä20ÄB6?@ÄE2082>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46Ä/EÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E0?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62Ä082?ÄJ/>ÄJ3 6ÄR268>EÄEÄEÄE06
= 6/? <6= 6>EÄ62Ä=46S

BORING NO.: **B-305**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?64ÄLCÄ/V, VÄ>4ÄT 1 0 CÄd 2 G
LOCATION: W67ÄV3= 62R 1B26Ä 32E 14@Ä

BORING NO.: **B-306**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !(KÄ\$ TOTAL DEPTH (FT): !!S * LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BÄÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9/Ä> SAMPLER: BÄ >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄ* ÄÄÄ \$ÄZ\$ * ÄÄÄ26ÄÄ B2ÄEÄ K

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄÜBRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä9@GEJ W, -ÄÜW6GJEÄÄ34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3I 62Ä6>GÄ W, ÄÄÄV6GJEÄÄÄ/!= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/326ÄB = R6 -^ ÄÜÄ3F [Ä </10Ä6? G>/E3 ÄÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD G LÄÄ+08ÄL>6ÄBJ6/2 = R6ÄÄJ0><E6Ä62Ä3E T8ÄÄTJ3E3>0/E6>Ä 6E6B2 D\$CÄÄ3EÄRÄF/516

P6I S 7OE:		6 R6 7OE:		V/? 0G T6>S 7RO:		BC;T 9PÄD+, - ;C M8 D		B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
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Ä(		Ä*		!		()		!#SÄ&		Ä!Ä%'		Ä&!%	
Ä*		Ä(		"		Ä**Ä!		!#SÄÄ		Ä#!**		Ä('ÄÄ	
(		!*		#		Ä('Ä)		!#SÄ)		Ä!Ä&'		!)***	
				(		!***		!#SÄ)		('%'ÄÄ'		ÄZ	

N3EE3ÄÖÄR82 B>ÄEÄ!SÄCÄE

BÄ E0Ä E3>Ä06?ÄR268>EÄR230E/E6
53<>4/ 2Ä56E66>Ä20ÄB6?@ÄE20B>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#Ä3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE6
= 6/? <B= 6>EÄ62Ä=46S

BORING NO.: **B-306**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?64ÄLCÄV/N, VÄ>4ÄT 1 0-CÄd 2 G
LOCATION: W67ÄV3= = 62R 1326E 32E 14@Ä

BORING NO.: B-307
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#1SÄ
DATE START:)\$Ä) \$ *Ä&
DATE FINISH:)\$Ä) \$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B3>Ä3F/ E3>Ä1 > ELEVATION (FT): ""KÄ\$ TOTAL DEPTH (FT): "IS* LOGGED BY: M9 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B3>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄE6 ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#A0\$ÄÄ\$Ä> SAMPLER: BÄ>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): ""ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄZ\$ ÄÄÄ\$Ä3 * ÄÄÄ26ÄÄ B2ÄEÄZ\$K

GENERAL NOTES:

KEY TO NOTES: W/ E2Ä9611 ÄÜBRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä96GEJ W, ÄÜÄW6GJEÄÄ-34? B,ÄÜ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄD-G YÄÄMÜOÄW164ÄM56ÄB = R6 -6F SÄÄF31 62H6>GÄ W, ÄÜÄV6GJEÄÄ)/= = 62 W, ÄÜÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/326ÄB = R6 -^ ÄÜÄ3F [Ä </10Ä6? G>/E3 Ä/Ä-2FE3>ÄG6Ä7P3 /E64:
V COE6ZÄD-G LÄÄ+08ÄL>6ÄB6/2 = ROÄJ0<E6Ä62Ä3E T8ÄÜÄTJ3E33>0/E3>Ä6E6B2 D\$CÄD3EÄBRF/516

P61 S 7OE:		6 R6 7OE:		V/7 0-G T6>S 7RO:		BC;T 9PÄD+, - ;C M8 D				B/ = R6 6?F2FE3>Äb V1 ??0F/ B3>		1,* 6REJ		- 6= / 2[?	
						B/ = R6 D3S	M8	6 R6 7OE:	T6>S -6 FS 79:	N8A V3<>E 32 ^	+08Ä\$Ä9 M6?EÄ Ä				
						Ä	!#	!#SÄ(	#'Z'&' Ä*						
						!	()	!#SÄ&	Ä!'Ä!' Ä#!'						
						"	Ä*ÄÄ&	Ä)S	Ä('##' (*S(.						
						#	Ä('Ä)	!#SÄ)	!'Ä' "!"						
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						Z	!'(!	!#SÄ&	&'&'Ä!' Ä(						
						)	"*!"	!#SÄ#	Z'ÄÄ' Ä#Ä%						

N3EESÄÄQR82 B3>ÄEÄ"SÄCÄE

BÄ E09 E3>Ä06?ÄQR268>EÄRR230/E6
53<>4/ 2Ä56E66>Ä20ÄB6?@ÄE20B3>?Ä=H
56ÄG2/4</SÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46Ä/EÄE0?Ä>4Ä<>462ÄB>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#Ä3F<Ä4<6.8E
3EJ62ÄCÄ2?ÄJ/>ÄJ3 6ÄR268>EÄEÄEÄE6
= 6/7 <B= 6>EÄ62Ä=46S

BORING NO.: B-307



BORING LOG

CLIENT: + B&NNA321 >4@9V
PROJECT: T2R3?64ÄLCÄ/N, VÄ>4ÄT 2 0 CÄd 2 G
LOCATION: W67ÄV3= = 62R 1B26E 32E 14@Ä

BORING NO.: **B-308**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä) \$ *Ä&
DATE FINISH:)\$Ä) \$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä1 > ELEVATION (FT): " &ÄK\$ TOTAL DEPTH (FT): "ZS LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BSVSÄ36ÄRR82/B>?@ÄV DRILLER: V32HÄV<110S DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ Ä 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#Ä0\$ÄÄ 9Ä> SAMPLER: BÄ >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$Ä\$ *Ä&ÄD3Ä6Ä/E62Ä5?62 64@R62Ä6Ä" Ä K

GENERAL NOTES:

KEY TO NOTES: W/ E2Ä96!! ÄÄBRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä9@GEJ W, -ÄÄW6GJEAÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄD-G YÄÄÄÄÄW164ÄM56ÄB = R6 -6F SÄÄ6F31 62Ä6>GÄ W, ÄÄÄW6GJEAÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CÄV3= R6B3Ä8Ä 20110> -ÄÄÄF [Ä/32ÄB = R6 5ROÄÄBÄ?ÄR62Ä3E -Ä ÄÄÄF [Ä </10ÄÄ? G>/E3Ä ÄÄ-2FE3>ÄG6Ä7PÄ /E64: ÄÄ-2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄB6/2 = ROÄÄJ0>E6Ä62Ä3E T8ÄÄÄJ3E33>0EG>Ä 6E6B2 D\$CÄD3EÄBRF/516

P6I S 7OE:	6 R6 7OE:	V/? 0-G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D				a2IRJ0Ä9G	B/ = R6 6?F2FE3>Äb V1 ??0F/ B>	J,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	M8	6 R6 7OE:	T6>S -6 FS 79:				
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BÄ E0Ä E3>Ä06?ÄBR268>EÄR23C/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20B>?Ä=H
56ÄG2/4</SÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄB>4E3>?ÄFE64S
+ÄFE</E3>?Ä30ÄS>4Ä/E62Ä#Ä3F<2Ä<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE06
= 6/7 <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-308**



BORING LOG

PROJECT / CLIENT: PROPOSED OFFICE BUILDING & PARKING GARAGE / J.B.BROWN & SONS
 LOCATION: WEST COMMERCIAL STREET, PORTLAND, ME
 DRILLING CO.: S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

BORING NO.: B-101
 SHEET: 1 OF 1
 PROJECT NO.: 15-0942
 DATE START: 9/16/2015
 DATE FINISH: 9/16/2015
 ELEVATION: 21'
 SWC REP.: T.BOYCE

CASING: TYPE H S A SIZE I.D. 2 1/4" HAMMER WT. HAMMER FALL
 SAMPLER: D 1 3/8" 140# 30"
 CORE BARREL:

WATER LEVEL INFORMATION
 GROUNDWATER @ 18'

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	1D	24"	21"	2.0'	4	8	8	5	2'	BROWN SANDY LOAM OVER TAN SILTY SAND WITH GRAVEL OVER BLACK-BROWN SAND & COAL ASH WITH BRICK FRAGMENTS (FILL)
	2D	24"	21"	7.0'	5	5	7	5		TAN FINE SAND TRACE SILT ~ MEDIUM DENSE ~
	3D	24"	24"	12.0'	6	9	11	9	14'	
	4D	24"	15"	17.0'	16	12	16	14	20'	BROWN-GRAY GRAVELLY SAND WITH OCCASIONAL GRAY CLAY SEAMS ~ MEDIUM DENSE ~
	5D	24"	15"	22.0'	7	8	10	10	25'	GRAY GRAVELLY SAND WITH FREQUENT OLIVE-BROWN SANDY SILT SEAMS ~ MEDIUM DENSE ~
	6D	24"	17"	27.0'	6	6	8	13		BROWN SAND, SOME SILT, SOME GRAVEL WITH OCCASIONAL BROWN SILT/CLAY SEAMS ~ MEDIUM DENSE ~
	7D									<< ABANDONED SAMPLE DUE TO 2' BLOW-IN >>
	8D								35'	<< ABANDONED SAMPLE DUE TO 2' BLOW-IN >>
										BOTTOM OF EXPLORATION @ 35'

SAMPLES: D = SPLIT SPOON
 C = 2" SHELBY TUBE
 S = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☐ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-101



BORING LOG

PROJECT / CLIENT: PROPOSED OFFICE BUILDING & PARKING GARAGE / J.B.BROWN & SONS
 LOCATION: WEST COMMERCIAL STREET, PORTLAND, ME
 DRILLING CO.: S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

BORING NO.: B-102
 SHEET: 1 OF 1
 PROJECT NO.: 15-0942
 DATE START: 9/16/2015
 DATE FINISH: 9/16/2015
 ELEVATION: 22'
 SWC REP.: T.BOYCE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. HAMMER FALL
 SAMPLER: D 1 3/8" 140# 30"
 CORE BARREL:

WATER LEVEL INFORMATION
 DRILLED WET

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
HW									0.4'	GRASS OVER 4" SANDY LOAM
	1D	24"	20"	2.0'	4	7	8	7	2'	LAYERED SAND & GRAVEL WITH COAL ASH (FILL) ~ MEDIUM DENSE ~
	2D	24"	22"	7.0'	4	3	7	5	8'	BROWN SILTY SAND, SOME GRAVEL (FILL) ~ MEDIUM DENSE ~ ROOTLETS @ 7'
	3D	24"	17"	12.0'	3	4	5	6		TAN FINE TO MEDIUM SAND, TRACE SILT ~ LOOSE ~
	4D									<< ABANDONED SAMPLE DUE TO 2' BLOW-IN >>
									20'	
OPEN HOLE	5D	24"	7"	22.0'	7	5	9	9	25'	TAN FINE TO MEDIUM SAND WITH GRAVEL AND OCCASIONAL GRAY CLAY SEAMS ~ MEDIUM DENSE ~
	6D	24"	24"	27.0'	2	3	3	3	29'	OLIVE-BROWN SILTY CLAY $q_p = 1.0$ to 0.0 ksf WITH FREQUENT BROWN & GRAY FINE SAND SEAMS ~ MEDIUM ~
	7D	24"	15"	32.0'	10	16	16	44		TAN SAND, SOME GRAVEL ~ DENSE ~
	8D	24"	5"	37.0'	6	36	23	21	40'	GRAY-BROWN SLTY SAND WITH GRAVEL (BASAL TILL) ~ VERY DENSE ~
										<< ABANDONED SAMPLE DUE TO 3' BLOW-IN >>
	9D									BOTTOM OF EXPLORATION @ 40'

SAMPLES:
 D = SPLIT SPOON
 C = 2" SHELBY TUBE
 S = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☐ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS:
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

3

BORING NO.: B-102



BORING LOG

PROJECT / CLIENT: PROPOSED OFFICE BUILDING & PARKING GARAGE / J.B.BROWN & SONS
 LOCATION: WEST COMMERCIAL STREET, PORTLAND, ME
 DRILLING CO.: S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

BORING NO.: **B-105**
 SHEET: 1 OF 1
 PROJECT NO.: 15-0942
 DATE START: 9/17/2015
 DATE FINISH: 9/17/2015
 ELEVATION: 30'
 SWC REP.: T.BOYCE

CASING: TYPE H S A SIZE I.D. 2 1/4" HAMMER WT. HAMMER FALL
 SAMPLER: D 1 3/8" 140# 30"
 CORE BARREL:

WATER LEVEL INFORMATION
 GROUNDWATER @ 20.5'

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									0.5'	BROWN SANDY LOAM OVER
	1D	24"	19"	2.0'	3	5	10	14		TAN-OXIDE FINE TO MEDIUM SAND, SOME GRAVEL, TRACE SILT ~ MEDIUM DENSE ~ << BLOWCOUNT OVERSTATED - GRAVEL IN TIP >>
	2D	24"	2"	7.0'	16	26	25	20		
									9'	GRAY SILT AND SAND, SOME GRAVEL ~ LOOSE ~ ~ MEDIUM DENSE ~ ...WITH BROWN LAYERS OF SAND & GRAVEL ~ LOOSE ~
	3D	24"	24"	12.0'	4	4	5	6		
	4D	24"	14"	17.0'	5	6	7	6		
	5D	24"	13"	22.0'	15	16	13	11		
	6D	24"	19"	27.0'	2	3	6	7		

SAMPLES: D = SPLIT SPOON
 C = 2" SHELBY TUBE
 S = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☐ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS:
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

9

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:	1/2" 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

LABORATORY TEST DATA



GRAIN SIZE ANALYSIS - ASTM D6913

PROJECT NAME: Proposed VA Facility
 PROJECT LOCATION: West Commercial Street, Portland, ME
 CLIENT: FD Stonewater
 TECHNICIAN: Erika Stewart, P.E.
 SOIL DESCRIPTION: SAND, some-little Gravel, trace Silt, SP

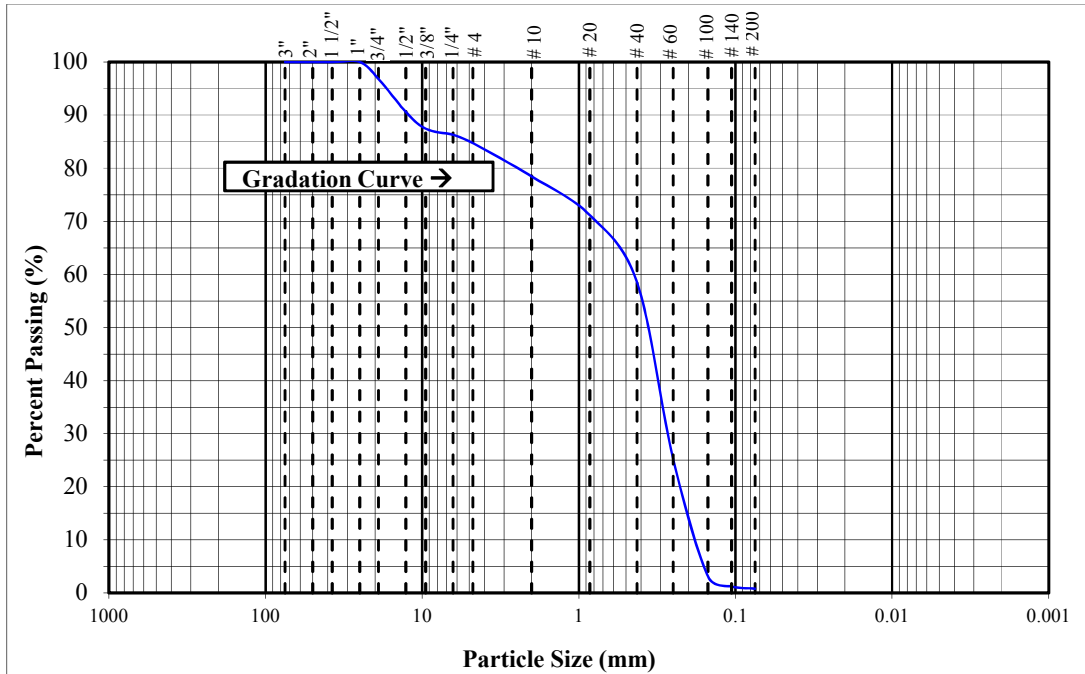
PROJECT #: 19329
 EXPLORATION #: TP-3
 SAMPLE #: S-1
 SAMPLE DEPTH: 4' - 6'
 TEST DATE: 10/7/2019

TEST PROCEDURE

Sample Source: Test Pit	Sieve Stack: Composite	Specimen Procedure: Moist
Test Method: Method A	Separating Sieve(s): 3/8 Inch	Dispersion Type: Tap Water

DATA

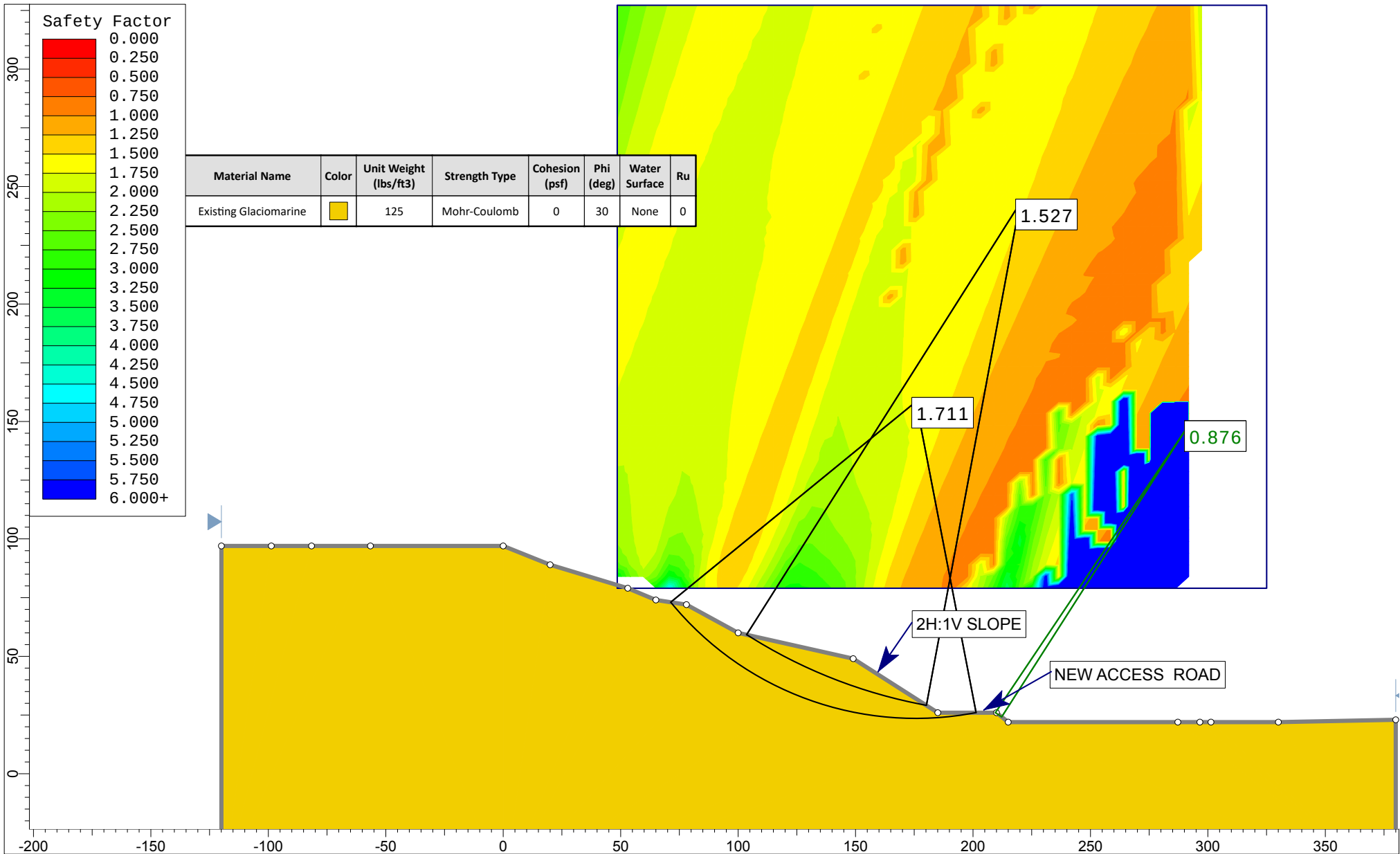
<u>STANDARD SIEVE</u> DESIGNATION (mm)	<u>ALTERNATIVE SIEVE</u> DESIGNATION (in)	<u>PERCENT</u> PASSING (%)
75	(3 in)	100
50	(2 in)	100
37.5	(1-1/2 in)	100
25.0	(1 in)	100
19.0	(3/4 in)	97
12.7	(1/2 in)	91
9.5	(3/8 in)	87
6.35	(1/4 in)	86
4.75	(No. 4)	85
2.00	(No. 10)	78
0.850	(No. 20)	71
0.425	(No. 40)	59
0.250	(No. 60)	25
0.150	(No. 100)	3
0.106	(No. 140)	1
0.075	(No. 200)	1



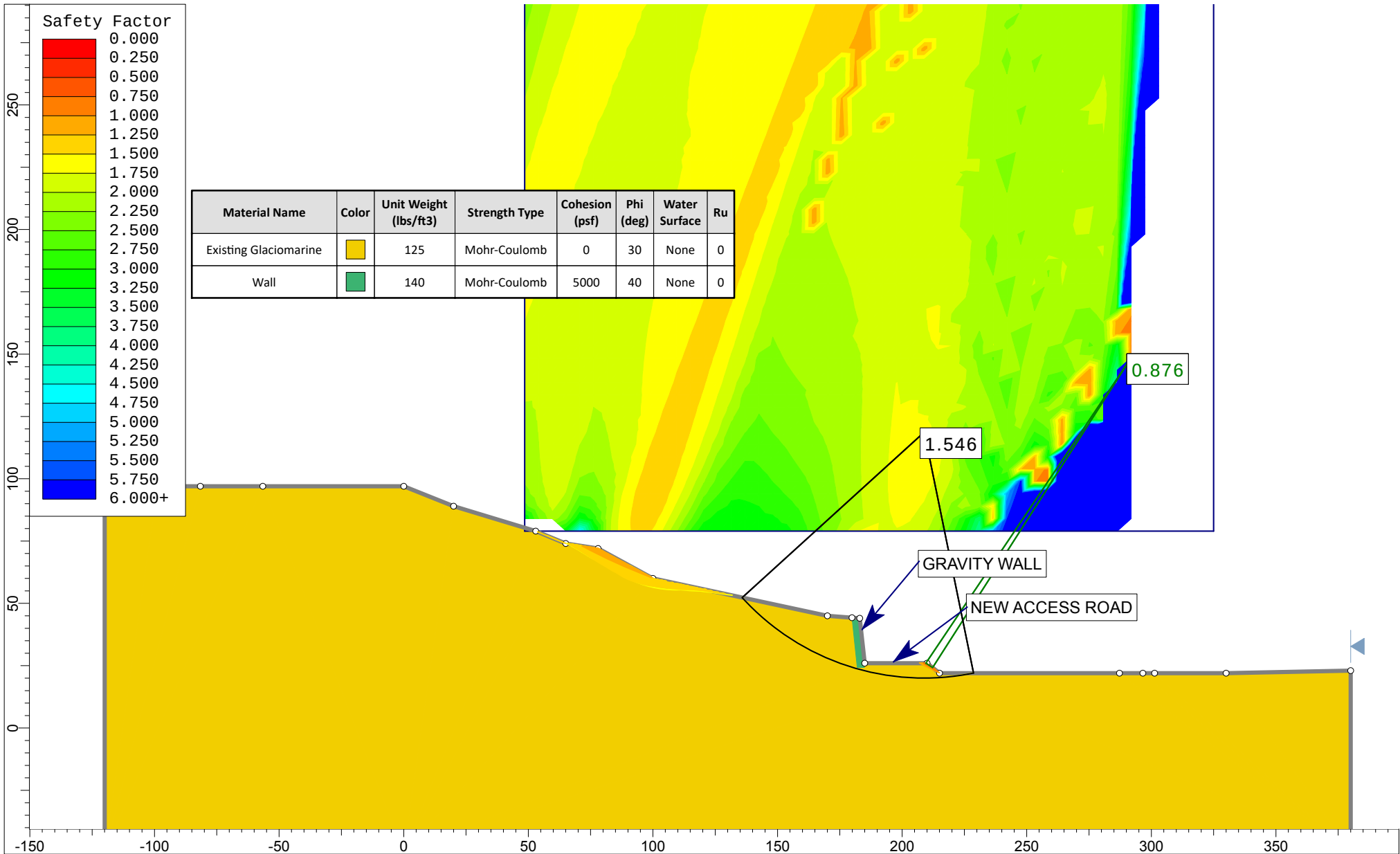
REMARKS: Moisture Content = 2.5%.

APPENDIX E

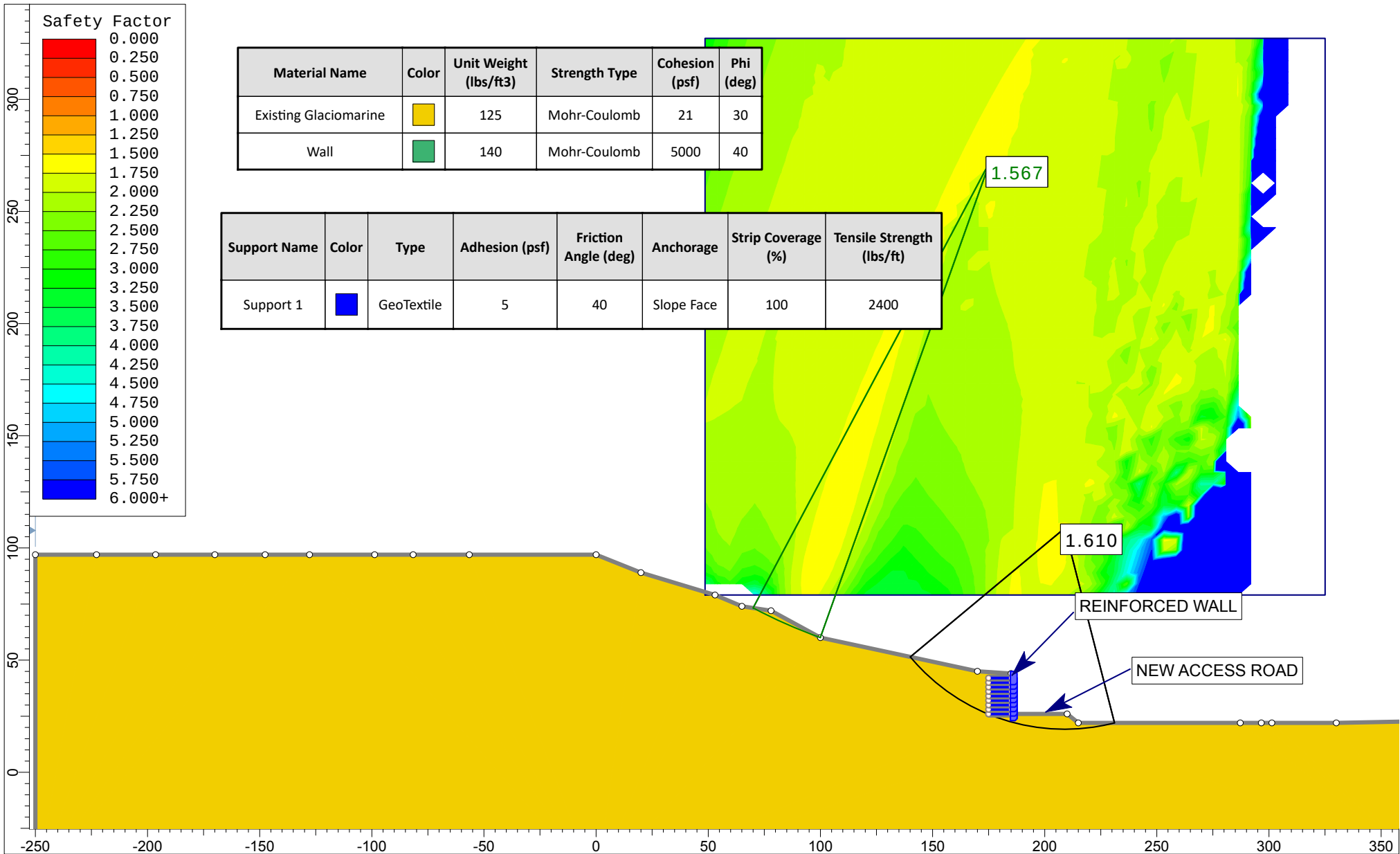
SLOPE STABILITY ANALYSES RESULTS



Project		West Commercial Street Portland	
EAST SIDE OF PARKING GARAGE - OPEN CUT FACE 2H:1V			
Drawn By		Scale 1:679	Company #19329
Date 11/4/2019		File Name proposed conditions NO SLOPE LIMITS.slmd	



Project			West Commercial Street Portland		
EAST SIDE OF PARKING GARAGE - GRAVITY RETAINING WALL					
Drawn By		Scale		Company	
		1:640		#19329	
Date			File Name		
11/4/2019			proposed conditions reinforced wall.slmd		



Project		West Commercial Street Portland	
EAST SIDE OF PARKING GARAGE - REINFORCED RETAINING WALL			
Drawn By		Scale 1:711	Company #19329
Date 11/4/2019		File Name proposed conditions.slmd	

ATTACHMENT G

Operation & Maintenance Manual

**VA CLINIC
113 WEST COMMERCIAL STREET
PORTLAND, MAINE**

**STORMWATER MANAGEMENT SYSTEM
OPERATION AND MAINTENANCE MANUAL FOR
STORMWATER FACILITIES**

Prepared for

**FDS JBB Portland LLC
10 Fore Street
Portland, Maine 04101**

Prepared by

**Gorrill Palmer
707 Sable Oaks Drive – Suite 30
South Portland, Maine 04106
207.772.2515**

January 2020

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APPENDICES

Appendix A – Summary Checklist for Inspection and Maintenance

Appendix B – Inspection Logs

Appendix C – Stormwater Drainage System Maintenance Agreement

Appendix D – Permits for Project

I. INTRODUCTION

Runoff from developed areas may contain a number of contaminants especially when emanating from rooftops, paved or lawn areas. This runoff can contain a significant amount of non-point contaminants, which can have an adverse impact on the receiving waters. The installation of wet ponds, many times combined with soil media filters, vegetated buffer strips and other stormwater best management practices can significantly reduce the non-point pollution discharge from the developed area.

The effectiveness of BMP's and other components of the system are dependent on their upkeep and maintenance to assure they meet their design function over an extended period of years. It is critical that the stormwater management facilities are inspected on a regularly scheduled basis, and that maintenance is performed on an as needed basis. It must also be recognized that the effectiveness of these facilities, and their maintenance requirements, are related to the stormwater drainage facilities that transport the flow to the outlets or treatment measures. Thus, maintenance should be directed to the total system, not just the BMP's.

The purpose of this document is to define in detail the inspection and maintenance requirements deemed necessary to assure that the stormwater management facilities function as intended on a long-term basis for the VA Clinic development. This Operations and Maintenance Manual is specific to the proposed stormwater measures utilized to execute a successful stormwater management plan. Subsequent sections identify individual maintenance items; give a brief commentary of the function and need of the item, a description of the work required, and a suggested frequency of accomplishment. While the suggested programs and schedules must be adapted to specific projects, the material presented should provide guidance for a successful long-term program.

A. Guidelines Overview

A summary of the individual components of stormwater management facilities for this project has been prepared. The format used in the summary is as follows:

Preface: A general description of what function/benefit the element is intended to provide. This is a short summary and not intended to provide the design basis, which can be found in other sources.

Inspection: This section provides the inspection requirements for the individual component.

Maintenance: The section provides general information on the routine maintenance requirements of this element.

Frequency: This section outlines the best judgment of the designer on the system to the frequency of maintenance.

Comments: This section provides any particular comment on the site-specific features of this element. This is a summary only. The owner/operator should review the design drawings and documents carefully to understand the particular elements of the project.

The end of this section should allow the owner/operator to make notes on the specific program. This may include the selected maintenance procedure, cross-references to applicable design drawings, etc.

A list of the individual inspection/maintenance elements is provided in the table of contents. The guidelines are proposed for initial use with adjustments made as appropriate based upon specific project experience.

This report includes the Operation and Maintenance requirements for any potential BMP identified in the Stormwater Management Report for this project.

B. Responsible Party

The responsible party for operation and maintenance of the stormwater and other site infrastructure will be the applicant or their agents or assigns. A copy of an unexecuted Stormwater Drainage System Maintenance Agreement is included in Appendix C.

II. PROJECT OVERVIEW

Key permits issued (or applied for) on the project include:

- City of Portland Level III Site Plan Approval
- Maine Construction General Permit Stormwater General Permit

A copy of the permits and Stormwater Management Report should be appended to this manual as Appendix D. The Owner/Operator of the stormwater management system should review these permits for a general description and background of the project, as well as any specific permit conditions or requirements of the project.

The applicant has retained Gorrill Palmer for civil engineering for the development project. Gorrill Palmer has prepared the design for the stormwater management facilities and may be contacted at:

Gorrill Palmer
707 Sable Oaks Drive – Suite 30
South Portland, Maine 04106
207.772.2515

The applicable plans and design documents which apply to the project are:

1. Civil Site Plans Prepared by Gorrill Palmer
2. The Erosion Control/Sedimentation Control Plan for the project
3. The Stormwater Management Plan for the project

A copy of these documents should be retained with this manual.

The proposed design includes inlets, stormwater conveyance lines, porous pavement, a subsurface sand filter, a filter cartridge, and an outlet control structure.

The key receiving waters for this project is the Fore River that is located south of the project site.

The manual is intended for general guidance; however, any substituted deviations from the manual should be reviewed with respect to provisions of Appendix D.

III. STANDARD INSPECTION/MAINTENANCE DESCRIPTIONS

The following narratives describe the inspection/maintenance provisions for the Stormwater Management system. These O&M procedures will complement scheduled vacuuming of the parking spaces which is anticipated to occur at least twice per year. Proper O&M is necessary to make sure the system will provide its intended purpose of conveying runoff, removing a substantial amount of the suspended solids, and other contaminants in the stormwater runoff. Routine vacuuming of the porous areas is critical to their successful functioning.

A. Stormwater Inlets

Preface: The success of any stormwater facility relies on the ability to intercept stormwater runoff at the design locations. Stormwater inlets include catch basins, open culverts, and field inlets. A field inlet exists in the FocalPoint® as an overflow structure. Several catch basins are located at the base of the northern cut slope.

Inspection: The inspection of inlet points will need to be coordinated with other maintenance items, these include:

- Building maintenance areas
- Grounds maintenance

The key elements of the inspection are to assure the inlet entry point is clear of debris and will allow the intended water entry.

Maintenance: The key maintenance is the removal of any blockage which restricts the entry of stormwater to the inlet. The removed material should be taken out of the area of the inlet and placed where it will not reenter the runoff collection system. Snow should be removed from inlets near the sidewalk areas. Grass clippings and leaves should be bagged and removed particularly near the yard inlets near the buildings.

Frequency: All inlets should be inspected on a quarterly basis, and after/during significant storm events i.e. >1" rainfall).

Maintenance Personnel: The maintenance personnel will perform the normal maintenance/inspections of the inlets and tributary drainage system.

Comments: Maintenance of inlets is critical on this project.

B. Tributary Drainage System

Preface: Stormwater from most of the project will be directed through filters and into a conveyance (tributary) system which transports the flow to the main point of discharge after.

This conveyance system will be principally overland flow discharging to piped drain systems. Most of the sediment carried by the drainage system is intended to be trapped in pretreatment devices and structures. Maintenance of this system can play a major role in the long-term maintenance costs and the effectiveness of the onsite systems. The primary pretreatment measure for the VA Clinic site will be through deep sumped catch basins with hooded outlets.

Inspection: The tributary drainage system should be periodically inspected to assure that it is operating as intended, and that the carrying capacity has not been diminished by accumulations of debris and sediment or other hydraulic impediments. On piped systems, the inlets must be inspected to ensure the rims are set at the proper elevation to optimize flow entry and are not clogged with debris.

The level of sediment in the sumps should be checked to assure their effectiveness. Pipelines connecting the inlets should be checked to determine if siltation is occurring. This will be most critical on drain lines laid at minimal slopes. This can usually be accomplished by a light and mirror procedure.

Maintenance: Maintenance of the storm drainage system must assure that it continues to serve its design function on a long-term basis, and that its operation does not transport excessive sediments to any downstream treatment device or the receiving waters. Elevations on the rim of catch basins should be adjusted as needed to assure optimal water entry. Depending on the frost susceptibility of the soil, the rims may become elevated over time causing flow to circumvent the inlet. If a temporary filter bag has been designated for the inlet during construction, silt or other deleterious materials, can significantly reduce capacity and the bags should be removed with the sediment and replaced during construction. Catch basin cleaning would normally be accomplished with vacuum trucks contracted as a maintenance service for the Development. The removed material must be disposed of at an approved site for such materials.

If sediment in the pipeline is observed, it should be removed. This may be accomplished by hydraulic flushing, or by mechanical means. If hydraulic flushing is used the downstream conditions should be analyzed.

Frequency: The tributary drainage system should be inspected on an annual basis. Adjustment of inlet rim elevations should be on an as needed basis. Cleaning catch basin sumps and pipelines will depend on the rate of accumulation.

C. Porous Pavement

Preface: The porous pavement collects stormwater runoff from the surface before passing it through a treatment section and discharging into a closed drainage system.

Inspection/Monitoring: The pavement should be inspected regularly to ensure that the surface is not clogged, and that runoff can pass freely through the porous section. The asphalt surface must be inspected for integrity and to ensure rutting or deformation of the surface is minimized.

Maintenance: Any debris should be removed from the pavement surface. If the porous pavement area is holding water in excess of 48-72 hours, corrective action is needed. To correct a standing water problem, the following remedial actions are recommended.

1. Vacuum any sediment or debris from the pavement surface on a semi-annual basis.
2. Ensure the underdrain system or outlet pipe orifice is not clogged with any silt or other materials.
3. Ensure that the porous pavement can pass water freely or drain quickly while handling large amounts of water.

Frequency: The porous pavement should be inspected and vacuumed semi-annually and maintained as necessary.

Maintenance/Inspection Responsibility: The Owner or an outside agent is responsible for inspection and maintenance of the porous pavement areas

Comments: Proper maintenance is critical for the porous pavement as it plays a large role in the overall stormwater management plan for the development.

D. Subsurface Sand Filter

Preface: The subsurface sand filter is a sand filter layer with storage above underneath a typical section for the applicable surface treatment. Stormwater runoff is conveyed to the filter through a closed pipe system from surface runoff and roof drains.

Inspection: The subsurface sand filter will have control structures and maintenance ports to inspect the pretreatment row and storage layer. Inspect system to see if runoff is draining through the system at the outlet and inlet devices. Visual inspections should also occur after large storm events (i.e. >1").

Maintenance: The procedures for maintenance are as follows:

- Inlets and Outlets
Inlets and outlets to the subsurface sand filter should be kept open and in good working condition. This is particularly important for the inlet at the pretreatment rows. Outlets should be cleared and, if necessary flushed of any build-up.
- Storage Layer
Remove and dispose of any sediment and build-up in the storage layer.
- Sedimentation (or Clogging) of Soil Filter Area
If the sand filter appears to be holding water for a period longer than 48-72 hours, the sand mix has, more than likely, become clogged with sediment and/or the underdrains have clogged. To correct a standing water problem, the following remedial actions are recommended:

1. Evaluate the drainage area to the sand filter area to identify any potential sources of sediment, such as an erosive condition, that may be contributing to the clogging of the device. If a source is identified, it is recommended that that source be eliminated to the fullest extent practicable before proceeding with the remaining recommendations provided below.
2. Flush the underdrains. Use cleanouts to flush the underdrains. Sediment in the drains may be preventing the sand filter from draining. Make sure to provide a way to capture any flushed sediment before it enters the stream environment or storm drain system downstream of the device. If, after flushing the underdrains, the device continues to hold water, the sand filter may be contaminated and need to be replaced.

Frequency: The subsurface sand filter should be inspected semi-annually and maintained as necessary.

Comments: Pretreatment in catch basin sumps and pretreatment row is crucial to long-term function of sand filter.

E. Proprietary Treatment Devices (FocalPoint®)

Preface: A FocalPoint® system will be used on site to treat surface runoff from impervious and landscaped area

Inspection: Inspection of the filter should be performed after each major rainfall event to ensure that stormwater runoff is able to pass through the filters. The vegetation should be inspected and maintained regularly similar to other landscape features on site. The underdrain outlet should be inspected regularly.

Maintenance: Clear inlets and pretreatment devices of debris and sediment. Maintain as instructed by manufacturer.

Frequency: The system should be inspected semi-annually and maintained as required by the manufacturer.

Comments: The manufacturer typically commits to the first year of maintenance if their strict guidelines are followed for installation, which is highly encouraged to achieve peak performance. It is recommended that an outside agent who is familiar with the product be retained for future maintenance.

F. Proprietary Treatment Devices (Filter Cartridge)

Preface: A filter cartridge will be installed in a catch basin in the loading dock well.

Inspection: Inspection of the filters should be performed after each major rainfall event to ensure that stormwater runoff is able to pass through the filters.

Maintenance: Clear the grate of debris. Ensure the filter is passing runoff freely, or at the specified rate. A standard cartridge should last a minimum of one year depending on the cartridge used. Maintain as instructed by manufacturer.

Frequency: The filter should be inspected semi-annually and maintained as required by the manufacturer.

Comments: An outside agent who is familiar with the product should be retained for maintenance of the product.

G. Orifice Control Devices

Preface: Orifices of assorted sizes are commonly utilized to control discharge from stormwater management features. This project uses orifice controls to control discharge from the porous pavement area and the subsurface sand filter.

Inspection: Inspection of orifices should be performed after each major rainfall event to ensure that stormwater runoff is able to discharge through the orifice and that it is not clogged.

Maintenance: The orifice cap should be removed and all debris flushed from the pipe prior to reinstalling the orifice cap. An orifice in a weir wall should be cleared of debris by hand.

Frequency: The orifice control devices should be inspected semi-annually and maintained as needed.

Comments: None.

H. Litter

Litter should be removed as a matter of course by workers and as part of the ground's maintenance contract.

IV. PROGRAM ADMINISTRATION

A. General

A reliable administrative structure must be established to assure implementation of the maintenance programs described in the foregoing section. Key factors that must be considered in establishing a responsive administrative structure include:

1. Administrative body must be responsible for long-term operation and maintenance of the facilities. (Maintenance continues for the lifespan of the development in accordance with this document)
2. Administrative body must have the financial resources to accomplish the inspection and maintenance program over the life of the facility.
3. The administrative body must have a responsible administrator to manage the inspection and maintenance programs.
4. The administrative body must have the staff to accomplish the inspection and maintenance programs or must have authority to contract for the required services.

5. The administrative body must have a management information system sufficient to file, retain, and retrieve all inspection and maintenance records associated with the inspection and maintenance programs.
6. A qualified post construction inspector shall be retained by the Owner. His/her duties shall include preparing schedules for the Owner's maintenance, summarizing the results of this maintenance and preparing an annual report on the operation, maintenance, and repair of the stormwater system which must be copied to the City. (The Owner shall be responsible for retaining a separate entity to perform maintenance which cannot be performed by the management of building and property grounds.) This person shall also participate in troubleshooting of the stormwater management system if a problem develops.

If any of the above criteria cannot be met by the entity assigned inspection and maintenance responsibilities, it is likely that the system will fail to meet its water quality objectives at some point during its life. While each of the above criteria may be met by a variety of formats, it is critical to clearly establish the assigned administrative body in a responsible and sustainable manner.

B. Record Keeping

Records of all inspections and maintenance work accomplished must be kept and maintained to document facility operations. These records should be filed and retained for a minimum 5-year time span. The filing system should be capable of ready retrieval of data for periodic reviews by appropriate regulatory bodies. Where possible, copies of such records should also be filed with the designated primary regulatory agency for their review for compliance with permit conditions. Typical inspection and maintenance record forms are attached hereto as Appendix B.

Beyond the initial 5-year time span of the original approval and maintenance plan, the stormwater management system will need to be recertified through the Department every 5 years to confirm that there is conformance with the original permit documents. This process will ensure all systems function properly over time. This document will remain valid throughout any subsequent recertification processes.

C. Contract Services

In some instances, or at specific times, the Maintenance Personnel may not have the staff to conduct the required inspection and/or maintenance programs as outlined in this document. In such cases, the work should be accomplished on a contractual basis with a firm or organization that has the staff and equipment to accomplish the required work.

The service contract for inspection and maintenance should be formal, well-written legal document which clearly defines the services to be provided, the contractual conditions that will apply, and detailed payment schedules. Liability insurance should be required in all contracts.

APPENDIX A

Summary Checklist Inspection and Maintenance

**Stormwater Management System
Maintenance Program
Summary Checklist**

Item	Commentary	Frequency				
		Monthly	Quarterly	Semi-Annual	Annual	Long Term
Stormwater Inlets	Stormwater inlets allow flow entry from a surface swale to a piped system. Inspect entry for debris accumulation. Remove debris to allow unimpeded entry. Lawn clippings and leaves should be removed from yard areas.		X		X Clearing	
Tributary Drainage System	Inspect to assure that the carrying capacity has not been diminished by debris, sediment or other hydraulic impediments.				X	
Porous Pavement	Inspect after storm events >1" to ensure the pavement is not plugged with debris. Vacuum semi-annually.			X		X
Subsurface Sand Filter	Inspect maintenance ports after rain events >1" and remove sediment. Check for signs of clogging and flush underdrains if necessary.			X		X
Proprietary Device (FocalPoint®)	Filters should be inspected semi-annually and maintained as needed. Snow Storage within the filter should be prohibited by Maintenance Personnel.			X		
Proprietary Device (Filter Cartridge)	Filters should be inspected semi-annually and maintained as needed. Snow Storage within the filter should be prohibited by Maintenance Personnel.			X		
Orifice Control Devices	Inspect after major storm events and clear debris from orifice. May require flushing of pipes.			X		
Litter	Litter should be removed daily.					

APPENDIX B

Sample Inspection Logs

**VA CLINIC
PORTLAND, MAINE**

STORMWATER MANAGEMENT
SAMPLE STORMWATER INSPECTION & MAINTENANCE LOG

This log is intended to accompany the Operation and Maintenance Manual for Stormwater Management and Related Facilities. All stormwater BMPs shall be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions of the DEP Stormwater Permit, shall conduct inspections of the facilities as described in the O&M Manual and on this form, and identified deficiencies must be corrected. This log shall be kept on file for a minimum of five (5) years.

A. General Information			
Project Name:	Inspection Date:		
Parcel/Lot:	Current Weather:		
BMP Owner:	Date/Amount Last Precip.:		
Owner Mailing Address:	Inspection Company:		
Owner Phone #:	Inspection Co. Mailing Address:		
Owner Email:	Inspector Name:		
	Inspector Phone #:		
	Inspector Email:		
B. Stormwater Inlets	Observations		
Frequency: Annually in the spring			
Accumulated sediments from inflow channels and pipes between basins have been removed and legally disposed of	☐ Yes ☐ No ☐ NA		
Floating debris and large sediment particles have been removed from inlets.	☐ Yes ☐ No ☐ NA		
Stormwater Inlet Notes:			
C. Tributary Drainage System	Observations		
Frequency: Annually spring or late fall and after heavy rains			
Remove and legally dispose of sediments	☐ Yes ☐ No ☐ NA		
Remove floatables and other objects	☐ Yes ☐ No ☐ NA		
Check for overgrown vegetation impeding flow	☐ Yes ☐ No ☐ NA		
Check pipelines for siltation and clogging	☐ Yes ☐ No ☐ NA		
Repair any slumping side slopes or erosion	☐ Yes ☐ No ☐ NA		
Replace any riprap on areas where any underlying fabric or underlying gravel is exposed.	☐ Yes ☐ No ☐ NA		
Tributary Drainage System Notes:			

D. Porous Pavement	Observations
Frequency: Semi-Annually	
Vacuum any sediment and debris from pavement surface	☐ Yes ☐ No ☐ NA
Check that underdrain system is functioning properly	☐ Yes ☐ No ☐ NA
Check for pooling or signs that pavement is clogged and doesn't pass water	☐ Yes ☐ No ☐ NA
Porous Pavement Notes:	
E. Subsurface Sand Filter	Observations
Frequency: Semi-annually	
Check that inlets are clear and flow into pretreatment row is not obstructed	☐ Yes ☐ No ☐ NA
Inspect maintenance ports and clear debris or buildup	☐ Yes ☐ No ☐ NA
Check for signs of clogging, or water is not draining within 48-72 hours	☐ Yes ☐ No ☐ NA
Bio-Retention Filters Notes:	
F. Orifice Control Devices	Observations
Frequency: Semi-Annually	
Check for debris blocking orifice	☐ Yes ☐ No ☐ NA
If applicable, flush underdrain pipe	☐ Yes ☐ No ☐ NA
Orifice Control Devices Notes:	
G. Proprietary Device (FocalPoint®)	Observations
Frequency: Semi-Annually	
Check for debris blocking orifice	☐ Yes ☐ No ☐ NA
Check overflow structure and clear debris	☐ Yes ☐ No ☐ NA
Check for signs of clogging, or water is not draining freely through filter media	☐ Yes ☐ No ☐ NA
If applicable, flush underdrain pipe	☐ Yes ☐ No ☐ NA
Proprietary Device Notes:	
H. Proprietary Device (Filter Cartridge)	Observations
Frequency: Semi-Annually	
Check for debris blocking orifice	☐ Yes ☐ No ☐ NA
Check for signs of clogging and that runoff is passing freely or at specified rate	☐ Yes ☐ No ☐ NA
Proprietary Device Notes:	

APPENDIX C

Stormwater Drainage System Maintenance Agreement

STORMWATER DRAINAGE SYSTEM MAINTENANCE AGREEMENT

U.S. Department of Affairs Community Based Outpatient Clinic and Park Garage at 141 West Commercial Street

IN CONSIDERATION OF the site plan approval granted by the Planning Board of the City of Portland to the proposed **Community Based Outpatient Clinic and Parking Garage Project ID PL-000927-2019** shown on the Overall Site Layout Plan, Grading, & Drainage Plan and Stormwater Management Plan (Exhibits A, B and C) prepared by Gorrill Palmer Consulting Engineers of 707 Sable Oaks Drive, South Portland, Maine dated last revised March 25, 2020 and pursuant to a condition thereof, FDS JBB Portland LLC, a Maine limited liability company with a principal place of business in Portland, Maine, and having a mailing address of c/o FD Stonewater, LLC 1001 19th Street North, Suite 1401, Arlington VA 22209, the owner of the subject premises, does hereby agree, for itself, its successors and assigns (the “Owner”), as follows:

Maintenance Agreement

That it, its successors and assigns, will, at its own cost and expense and at all times in perpetuity, maintain in good repair and in proper working order the porous pavement systems, Subsurface sand filter systems, Roof drains and loading dock drain Filter Cartridge system, Oil-Water Separator and related onsite drainage infrastructure, (hereinafter collectively referred to as the “stormwater system”), as shown on the Stormwater Management Plan in Exhibit C and in strict compliance with the approved Stormwater Inspection and Maintenance Manual prepared for the Owner by Gorrill Palmer Consulting Engineers (copy attached in Exhibit D) and Chapter 32 of the Portland City Code.

Owner of the subject premises further agrees, at its own cost, to keep a Stormwater Maintenance Log. Such log shall be made available for inspection by the City of Portland upon reasonable notice and request.

Said agreement is for the benefit of the said City of Portland and all persons in lawful possession of said premises and abutters thereto; further, that the said City of Portland and said persons in lawful possession may enforce this Agreement by an action at law or in equity in any court of competent jurisdiction; further, that after giving the Owner written notice and a stated time to perform, the said City of Portland, by its authorized agents or representatives, may, but is not obligated to, enter upon said premises to maintain, repair, or replace said stormwater system in the event of any failure or neglect thereof, the cost and expense thereof to be reimbursed in full to the said City of Portland by the Owner upon written demand. Any funds owed to the City under this paragraph shall be secured by a lien on the property.

This Agreement shall also not be construed to allow any change or deviation from the requirements of the subdivision and/or site plan most recently and formally approved by the Planning Board of the City of Portland.

This agreement shall bind the undersigned only so long as it retains any interest in said premises, and shall run with the land and be binding upon the Owner’s successors and assigns as their interests may from time to time appear.

The Owner agrees to record a copy of this Agreement in the Cumberland County Registry of Deeds within thirty (30) days of final execution of this Agreement. The Owner further agrees to provide a copy of this

Agreement to any successor or assign and to forward to the City an Addendum signed by any successor or assign in which the successor or assign states that the successor or assign has read the Agreement, agrees to all its terms and conditions and the successor or assign will obtain and forward to the City's Department of Public Services and Department of Planning and Urban Development a similar Addendum from any other successor or assign.

For the purpose of this agreement and release "Owner" is any person or entity who is a successor or assign and has a legal interest in part, or all, of the real estate and any building. The real estate shown by chart, block and lot number in the records on file in the City Assessor's office shall constitute "the property" that may be entered by the City and lien if the City is not paid all of its costs and charges following the mailing of a written demand for payment to the owner pursuant to the process and with the same force and effect as that established by 36 M.R.S.A. §§ 942 and 943 for real estate tax liens.

Any written notices or demands required by the agreement shall be complete on the date the notice is attached to one or more doors providing entry to any buildings and mailed by certified mail, return receipt requested or ordinary mail or both to the owner of record as shown on the tax roles on file in the City Assessor's Office.

If the property has more than one owner on the tax rolls, service shall be complete by mailing it to only the first listed owner. The failure to receive any written notice required by this agreement shall not prevent the City from entering the property and performing maintenance or repairs on the stormwater system, or any component thereof, or lien it or create a cause of action against the City.

Dated at Portland, Maine this ____ day of _____, 2020.

(name of company)

(representative of owner, name and title)

STATE OF MAINE
CUMBERLAND, ss.

Date: _____

Personally appeared the above-named _____ (name and title), and acknowledged the foregoing instrument to be his free act and deed in his said capacity.

Before me,

Notary Public/Attorney at Law

Print name: _____

Exhibit A: Approved Site Layout Plan
Exhibit B: Approved Grading & Drainage Plan
Exhibit C: Stormwater Management Plan
Exhibit D: Approved Stormwater Inspection and Maintenance Manual

APPENDIX D

Permits for Project

(To be Added at a Subsequent Time)



707 Sable Oaks Drive, Suite 30
South Portland, ME 04106
207.772.2515

March 26, 2020

Ms. Alison Sirois
MeDEP
312 Canco Road
Portland, Maine 04103

**Subject: VA Community Based Outpatient Clinic (CBOC) and Parking Garage
141 West Commercial Street
Delegated Review Authorization to the City of Portland
Applicant: FDS JBB Portland LLC**

Dear Alison:

On behalf of **FDS JBB Portland LLC** (Applicant), our office is pleased to provide the accompanying package of materials related to the proposed VA Clinic and parking garage proposed on West Commercial Street in Portland. This submission package is intended to allow your consideration for the City of Portland Planning Authority delegated review of the site plans for the project under the Site Location of Development Act. The proposed site for the CBOC is located on West Commercial Street in Portland, ME within the Area of Consideration as shown in the RLP. The site is 8.40 acres in size and is unencumbered by existing structures for preservation, reuse, or demolition. An abandoned rail spur exists on the site without any record of an easement found. The developable portion of the site has approximately 5.17 acres of land and 1,400 LF of street frontage on West Commercial Street. Approximately four acres of the developable site is Zoned B-5b, Commercial, which is where the CBOC will be located. The other four acres (on the uphill slope) is zoned R-4, Residential. A Medical Clinic is a permitted use in the Commercial Zone and this makes the CBOC a use-by-right without need to seek special permitting on the site. The parking garage is a similar by-right land use for the property.

In accordance with the typical Site location of Development application sections we offer the following abbreviated background by section. Further information is outlined in the accompanying materials that have been made part of the Level III Site plan application to the City.

Section 1 – Development Description

The applicant is proposing to construct a 62,300 SF VA Clinic and 385 vehicle parking garage. The development will require 4.73 acres of disturbance and 3.93 acres of impervious area. The development site is a former rail yard and is currently undeveloped. The property is served by public utilities. The site development will include stormwater management measures to satisfy the Chapter 500 Stormwater Management regulations including Basic Standards and General Standards. See the accompanying Project Description section for more information and background.



Section 2 – Title, Right or Interest

J.B. Brown & Sons currently owns the property as evidenced in the deed recorded in CCRD Book 29147 page 254 attached to the Title, Right or Interest section of the Level III Site Plan submission. FDS JBB Portland LLC currently is entered into a Lease Agreement with the federal government for a 20-year period as evidenced by the attached redacted documents.

Section 3 – Financial Capacity

See attached section made part of the City submission

Section 4 – Technical Ability

See attached section made part of the City submission

Section 5 – Noise

The development is classified as a minor noise generator. All HVAC equipment and the emergency generator will meet the City's local noise standards for sound levels at the property line.

Section 6 – Visual Quality and Scenic Character

The development complies with applicable zoning standards and have been reviewed by the City's Urban Designer for compliance with the relevant architectural and building standards. The site is in an area of adjacent mixed land use and is not located in an area of significant visual quality or scenic character.

Section 7 – Wildlife and Fisheries

See the accompanying response letter dated March 10, 2020 indicating there are no essential habitats or inland fisheries that will be affected by the project.

Section 8 – Historic Sites

See the accompanying reply letter dated September 6, 2018 indicating no impacts to cultural resources.

Section 9 – Unusual Natural Areas

See that accompanying reply letter dated March 6, 2020 from the Maine Natural Areas Program indicating there are no rare botanical features documented specifically within the project area.

Section 10 – Buffers

The existing hillside will remain undeveloped except for some supplemental plantings to improve buffering to the residential neighborhood off Danforth Street. There are no significant resources that require buffering. See accompanying narratives that are part of the Level III submission.

Section 11 – Soils

A High intensity soil survey has not been performed for the site since the development will be served by public water and sewer utilities. A geotechnical investigation has been performed by Summit Geotechnical Engineering and the onsite soils have been found to be suitable to support the proposed development activity.



A copy of the geotechnical investigation report is included within the Stormwater Management Report included with this package.

Section 12 – Stormwater Management

See accompanying Stormwater Management Report and supporting calculations. The project will comply with the Basic, General and Flooding standards.

Section 13 – Urban Impaired Stream Submission

Not applicable – the site is tributary to the Fore River.

Section 14 – Basic Standards

See accompanying Erosion Control details and narratives contained with the plan documents.

Section 15 – Groundwater

See the accompanying geotechnical report. The development does not involve any new wells or onsite wastewater disposal. Groundwater is not expected to be encountered during construction as the observed groundwater depth is greater than 10' below grade. All stormwater management systems will be located with the bottom of the system at least 3' separated above the groundwater table.

Section 16 – Water Supply

The development will be served municipal water from the Portland Water District. The City of Portland requires a determination letter from the PWD, which will be supplied to them upon receipt.

Section 17 – Wastewater Disposal

The development will be served by municipal wastewater collection and conveyance and treatment at the Wastewater treatment plant. The City of Portland requires a wastewater capacity authorization from their DPW staff, which will be made part of their approval.

Section 18 – Solid Waste

The project will involve private contract services for the handling and disposal of typical solid waste. A private waste hauler will also be used for the collection and disposal of medical waste, in accordance with all local, state and federal regulations. Recognizing this is a federal facility, we expect that their solid waste handling practices will be compliant.

Section 19 – Flooding

The development site is not located within a mapped flood area according to the City of Portland flood mapping. The City of Portland is currently pursuing a drainage improvement project along West Commercial Street that will provide new drainage infrastructure collection and conveyance system that will outfall to the Fore River and tidal conditions.

Section 20 – Blasting

Not applicable to the project.



Section 21 – Air Emissions

The development will not result in any major sources of emissions including either point source or non-point sources. Any mechanical equipment including an emergency power generator will have exhaust that will comply with all local, state and federal limits.

Section 22 – Odors

The Development will not result in any major sources of odors as does not involve production, manufacturing or related odor sources.

Section 23 – Water Vapor

The development does not involve the large-scale emission of water vapor as it is not a processing plant or power generating facility.

Section 24 – Sunlight

The development will not block access to direct sunlight for structures utilizing solar energy.

Section 25 – Notices

The project has been publicly noticed for both the City of Portland Planning Board workshop and a neighborhood meeting that was held on February 13, 2020. Supporting evidence accompanies this letter and the City of Portland Application files for your records.

We trust that this information will allow your prompt consideration and response to the City Planning Department (Andrew Tufts – Planner atufts@portlandmaine.gov). The project is tentatively schedule for a Planning Board Public Hearing for approval at their April 14, 2020 meeting.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

GORRILL-PALMER

Stephen Bushey, PE

Senior Associate

Phone: 207-772-2515 x286

sbushey@gorrillpalmer.com

Attachments

c: Andrew Tufts, City of Portland Planning

Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: 207-287-3901

FOR DEP USE
ATS # _____
L- _____
Total Fees: _____
Date: Received _____

FORM A PAGE 1

SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.S.A. §§481-490

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)		☐ 20 acre development	☐ Marine Oil Terminal	☐ Major Amendment
		☐ Planning Permit	☐ Structure	☐ Minor Amendment
		☐ Metallic Mining	☐ Subdivision	
1. Name of Applicant:	FDS JBB Portland, LLC Attn: Claiborne Williams	6. Name of Agent (if applicable):	Gorrill Palmer Attn: Steve Bushey, PE	
2. Applicant's Mailing Address:	1001 19th Street North, Suite 1401 Arlington, VA 22209	7. Agent's Mailing Address:	707 Sable Oaks Drive South Portland, ME 04106	
3. Applicant's Daytime Phone #:	213.600.4326	8. Agent's Daytime Phone #:	207.772.2515	
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):	cwilliams@fdstonewater.com	10. Agent's e-mail address (REQUIRED - license will be sent via e-mail):	sbushey@gorrillpalmer.com	

PROJECT INFORMATION

11. Name of Development:	VA Community Based Outpatient Clinic				
12. Map and Lot #'s:	Map #: 060/A001	Lot #: 001	13. Deed Reference #'s:	Book #: 29147	Page #: 254
14. Location of Project City/Town:	Portland	15. County:	Cumberland	16. UTM Northing	17. UTM Easting
18. Brief Description of Project including total parcel size:	Proposed U.S. Veterans Affairs Community Based Outpatient Clinic and Parking Garage at 141 West Commercial Street in Portland. The total site area is 8.4 acres in size.				
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: 5.17	Existing Developed area: 5.17 acres		New Developed area: 4.73 acres	
22. Amount of Impervious Area:	Total acres:	Existing Impervious areas: _____ acres		New Impervious area: 3.93 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	☐ Full Permit ☐ Tier 2
28. Existing DEP Permit number (if applicable):					
29. Names of DEP staff person(s) present at the pre-application meeting:					
30. Does agent have an interest in project? If yes, what is the interest?	☐ Yes ☒ No				

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

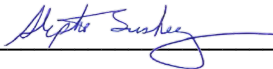
IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

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.

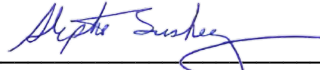
Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the electronic address located on the front page of this application (see #5 for the applicant and #10 for the agent)"..

Signed:  Title Agent Date: March 25, 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.

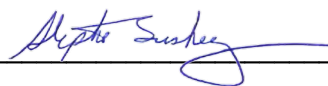
If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.

Signed  Date: March 25, 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): Stephen R. Bushey, PE

Date: Marh 25, 2020

Re/Cert/Lic No.: _____

Engineer _____

Geologist _____

Soil Scientist _____

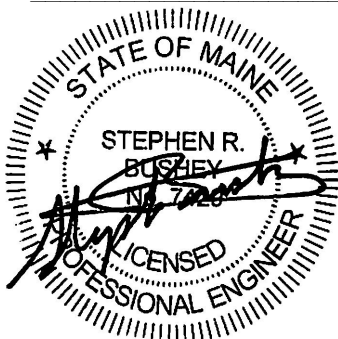
Land Surveyor _____

Site Evaluator _____

Active Member of the Maine Bar _____

Professional Landscape Architect _____

Other _____





707 Sable Oaks Drive, Suite 30
South Portland, ME 04106
207.772.2515

April 15, 2020

Mr. Andrew Tufts

Planning and Development Department
City of Portland, Maine
389 Congress Street
Portland, Maine 04101-3509

**Subject: VA Community Based Outpatient Clinic (CBOC)
Project ID – PL-0000927-2019
141 West Commercial Street
Letter of Response #3**

Dear Andrew:

On behalf of **FDS JBB Portland LLC** (Applicant), our office is pleased to provide the following responses to staff review comments provided within an email and letter dated April 3, 2020. For ease of review we have repeated all of the staff comments in *italics* and provide our responses in **bold** as follows:

MIKE TREMBLAY, DPW P.E. SENIOR ENGINEER

Comment

An alternating merge condition is preferable to a lane drop, which is what is currently shown on the western approach to the project frontage.

Response

The accompanying West Commercial Street plans have been updated to reflect an alternating merge condition for the east bound approach to the Clinic's westerly driveway instead of a Center Two Way Left Turning Lane (CTWLTL). Dedicated left turn lanes have also been provided for the development's center and easterly driveways. Drawings #1 and #2 for West Commercial Street have been uploaded to eplan.

Comment

The applicant should add definition to the two-way center left-turn lane where possible. For example, west of the western site driveway, there is no reason to show this as a two-way left-turn lane because there is nothing to turn into on the south side of the roadway; this segment of the TVLTL will serve the project site only. Similar definition may be possible at other points along the site frontage (e.g. between the western and central site driveways). This definition should be based on anticipated maximum queue lengths within this left-turn lane (some extra distance is OK as a factor of safety). Where no left-turn lane is warranted, painted gore areas should be used.



Response

The accompanying West Commercial Street Plans have been updated to provide left turn lanes into the far westerly and easterly driveways in place of a CTWLTL. The left turning vehicle volume into the Canal Landing middle driveway is very low, thus providing a CTWLTL for the VA site central driveway and Canal Landing seems appropriate.

Comment

It appears that the bicycle lane pinches in width in the vicinity of the proposed crosswalk and raised median islands. It is not clear what the proposed bike lane width at this pinch point is; however, bike lanes should be no narrower than 5 feet (6 feet, or 5 feet plus buffer, preferred).

Response

Bike lanes on both sides of the street from the Canal Landing easterly driveway to the VA Clinic westerly driveway will be at least 5' wide. Additional dimensions have been added to the plan to reflect the available widths. This width is consistent with previous recommendations contained in the 2009 West Commercial Street Feasibility Study and the 2016 West Commercial Street Multi-Modal Corridor Study. In fact, the current design features 5' wide bike lanes on each side of the street plus a 10' shared pathway within the right of way, which exceeds the accommodations for pedestrian movement in either study. More information regarding options for the pathway are discussed later in this letter in response to comments from Bruce Hyman.

SITE PLAN COMMENTS

Comment

Data provided to us via the applicant's traffic engineer indicated that 30% of patients are dropped off. This would seem like a significant number of vehicles set to use the 3-space pick-up/drop-off area. As I've commented before, DPVW is concerned with the size of this drop-off area and its potential to become congested, potentially causing backup into West Commercial Street. The applicant should show that this pick-up/drop-off area can work as intended given the data provided by the VA

Response

The AM Peak hour of the generator (Figure 2C) shows there to be 130 total trips at the center driveway; therefore, about 39 (30%) will require assistance or are otherwise apt to use the patient drop/pick-up area. Those values are 115 and 35 respectively in the PM hour. So in the higher volume AM peak hour, this is about a vehicle every 90 seconds or so. The original design contained three spots in the drop/pick up zone. We offer the following basic comparison of expected need time with the availability of space provided by the three parking spaces.

Total time required:

- 39 cars x 3 min/car = 117 minutes

Total time available in peak hour:

- 3 spaces at 60 min/space = 180 minutes



This assessment suggests that the three spaces will be adequate. However, in order to assure adequate accommodations for VA visitors are provided in the drop/pick-up zone, we have revised the design to provide a total of four (4) drop/pick-up spaces at the Clinic entrance. We believe that the addition of another short-term space will adequately provide for those who require immediate access to the drop zone and building entrance.

Comment

The Applicant has indicated that the VA requires separate driveways for patients and staff, which would make patient use of the western driveway to access the pick-up/drop-off area from the back of the site impossible. Given the urban location and the confined nature of the central driveway, flexibility on the part of the VA to allow for both employees and drop-off vehicles to use the western driveway would alleviate DPW's concerns about the central driveway operations significantly. Signage could direct long-term patient parking to the eastern driveway, and drop-off activity and employee parking to the western driveway. The central driveway would become exit-only, but garage access via the driveway oval could be maintained to allow for direct entry into the garage after a patient is dropped off, and allow for people parked in the garage to quickly pick up their passenger without needing to exit the site.

Response

The development team continues to believe that the placement of the three project driveways to allow full service entry/exiting movements is satisfactory and each unsignalized driveway intersection will operate at a high overall level of service, as evidenced in the updated Traffic Impact study prepared by Traffic Solutions and recently uploaded for City staff and traffic peer review.

Comment:

At the central driveway, the raised medians "intrude" into the shared use pathway, forcing users to "jog" around them, closer to the roadway. This is undesirable. The stop bar for the central driveway should be set behind the shared use pathway, and no site elements should intrude into the continuation of the 10-foot path.

Response

The latest plans include modifications to address the small island and interface between the pathway and the Clinic's central driveway. We believe these revisions address this comment.

Comment

All driveways should be designed to slope up to the level of the shared use path, rather than forcing shared use path users to ramp down to street grade at each driveway. At the center driveway, a raised table extending from the driveway apron to the oval area would allow for easier pedestrian flow and prioritize pedestrians walking from the garage to the clinic. This will also alleviate grading concerns noted above.

Response

The latest plans include grading to allow each pathway interface with the driveway crossings to be relatively smooth and free of traditional curb ramps. A raised crosswalk is provided at the crossing between the garage and the Clinic building entrances. We have chosen not to provide a raised condition from the driveway apron to the circular zone.



COMMENTS FROM LAUREN SWETT

Comment

As previously noted, the project will meet the area thresholds for Site Location of Development, but also meets the SLODA area thresholds for Delegated Review. An application that includes the application form as well as narrative that addresses all applicable Site Law standards should be provided. Many of these items are already addressed as part of the Level III Site Plan Application. The Applicant will be required to contact applicable review agencies including MHPC, MNAP, and MDIF&W. Paper copies are required to be submitted to the City for submission to the Maine DEP.

Response

The applicable Site Location of Development materials including an application form and relevant supporting documents have been provided to both City Staff and the MeDEP.

Comment

The project will require new electrical, gas, sewer, and water services to the clinic and power and sewer to the garage, which are existing within West Commercial Street. The Applicant shall confirm with each of the respective utilities the ability to serve the project and provide the City with documentation from each utility. The Existing Conditions & Removal Plan also notes "Relocate Utility Pole (By Others) Requires Coordination with CMP"; the Applicant should provide clarification on the plans for the utility pole relocation.

Response

The development team continues to seek the determination letters from each of the utilities and we will provide this evidence to the city upon receipt from each provider.

Comment

The project is required to comply with stormwater management regulations in accordance with Maine DEP Chapter 500 and City of Portland Technical Manual Chapter 5 stormwater regulations. The project will also be required to meet the standards as required for a Site Location of Development permit.

- *Basic Standards: The Applicant is providing erosion and sedimentation controls in conformance with the Basic Standards.*
- *General Standards: The proposed stormwater management system achieves the required developed area treatment standard of 80% by treating 85.59% of the developed area. However, the overall treatment percentage for impervious areas fall below the 95% treatment standard, treating 93.16% of the new impervious area. The applicant proposes to increase the runoff treatment depth from the porous pavement section and employ a catch basin filter cartridge in the loading dock truck well in order to supplement the impervious area that cannot be treatment due to grade restrictions and existing utilities within the ROW. We are in agreement with this approach to providing treatment.*
- *Flooding Standards: The Applicant has requested a waiver from the flooding standard. The increase in flow at POI is significant, and is not at a level where we would typically allow for a waiver. The Applicant has noted that this is a location that currently sees offsite/street flooding, and that the project will only result in a small increase in the existing negative condition. The Applicant should provide additional on-site stormwater storage – the project should not increase stormwater flow to the City's infrastructure, and should not make a flooding condition offsite worse.*



We will continue to review the details of the stormwater design, but suggest that the Applicant consider their alternatives for meeting the Flooding Standard.

Response:

Gorrill Palmer has been retained by the City's DPW to assist with a drainage improvement design that will address deficiencies with the existing drainage infrastructure along West Commercial Street. The City is expected to undertake an improvement project that will replace at least four catch basins in West Commercial Street and provide for a new drainage pipe with capacity to handle the discharges from the VA site. The new storm drain will connect into the existing Vaughn Street overflow system that discharges to the tidal conditions of the Fore River. On this basis, we believe that the proposed onsite stormwater management measures for quantity control and water quality treatment will comply with the City's standards.

COMMENTS FROM BRUCE HYMAN

Comment

Effective width of the pathway: A 10' pathway next to a retaining wall is effectively not a functioning 10' pathway which should be the minimum. Against a raised barrier, the closest foot won't be used by pedestrians and the closest two feet won't be used by bicyclists. 8 feet of effective width is not enough room for two bicyclists to comfortably pass on another. The retaining wall should be moved to provide a 2' offset.

Similarly the light poles shown on the plan should be set back a min. of 2' from the southerly side of the path.

Response

Gorrill Palmer has evaluated several options while considering the following:

- **A retaining wall is required to overcome the grade difference between the development site and the street grades. There is a 2' to 6' grade difference between the higher site and lower road.**
- **The current plans place the retaining wall alignment along the existing right of way line. The face of wall generally lines along the right of way line and the wall units and any reinforcing will actually extend back into the site, thus likely requiring at least an easement for the placement of this public infrastructure on private property.**

On the basis of these conditions we evaluated three options for configuration of the pathway between the proposed curb line and the retaining wall, which is basically a distance of 15'±.

Option 1 – Maintains a 3' landscaped buffer and not 5' as original designed along the curb that can be planted or have cobblestones to differentiate it from the path. This results in a 12' shared-use path that allows for a 2' shy distance from the wall while still maintaining the minimum 10' effective width. Proposed lighting could be placed up against the wall in order to create a more open feel for pedestrians. This will also avoid placing the light poles over the existing 115 KVA UGE line.

Option 2 – Pave the entire pathway, this would provide plenty of room for pedestrians along this stretch.



This results in a 15' shared-use path that allows for a 2' shy distance from the wall while still maintaining a 13' effective width. If the City requires a separation buffer from the roadway, a surface barrier would be required since fencing will not likely be allowed due to the 115 KVA UGE.

Option 3 – Flip the current design and provide the 5' landscaped buffer up against the proposed retaining wall and the 10' path adjacent to the curb. This results in a 10' wide path without reduction due to shy factors. The proposed lighting could be placed behind the sidewalk in the landscaped buffer. The City would need to waive the right to have a buffer between the sidewalk and the face of curb, however, it is worth noting that the section of West Commercial that is being designed by the City in front of the Star Match Building currently has the 10' path adjacent to the curb.

A graphic of each of these options is contained as Attachment A to this letter.

We note that we continue to work with DPW on the design of the Emery Street Sewer relocation and we expect to provide supplemental information on the design to Brad Roland over the upcoming days.

We trust that these responses and supplemental information satisfy current Staff comments and we look forward to the next available placement on the Planning Board's agenda for a Public hearing.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

GORRILL-PALMER

Stephen Bushey, PE

Senior Associate

Phone: 207-772-2515 x286

sbushey@gorrillpalmer.com

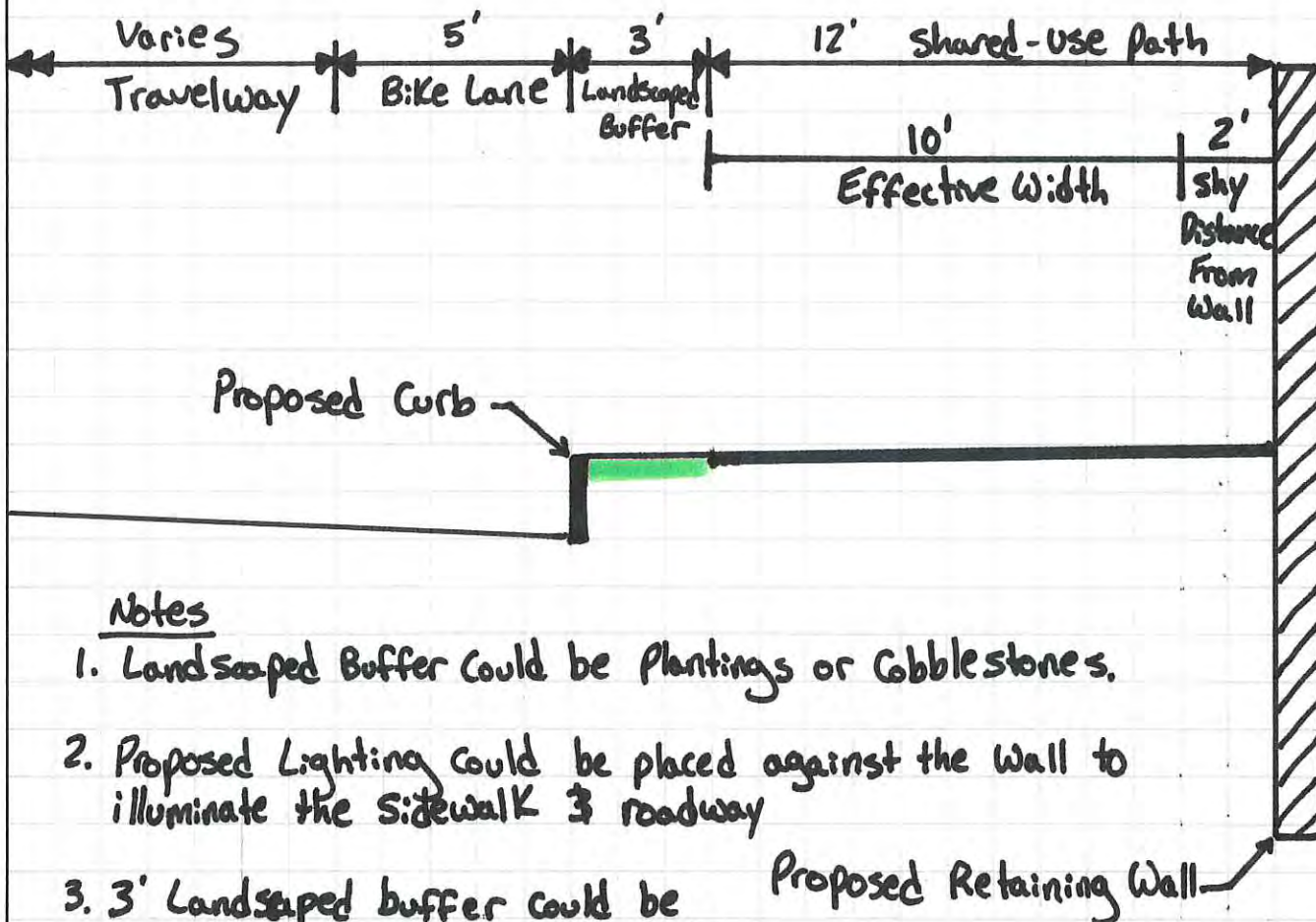
Attachments

c: FDS – Claiborne Williams
JBB – Vin Veroneau
SmithGroup – Greg Heppner
Landry French – Mason Rowell

u:\13572_va clinic west commercial st-portland, melp applications\local\level iii site plan application\lor\lor#3\lor#3_tufts_04.15.2020_final.docx

ATTACHMENT A

Option 1



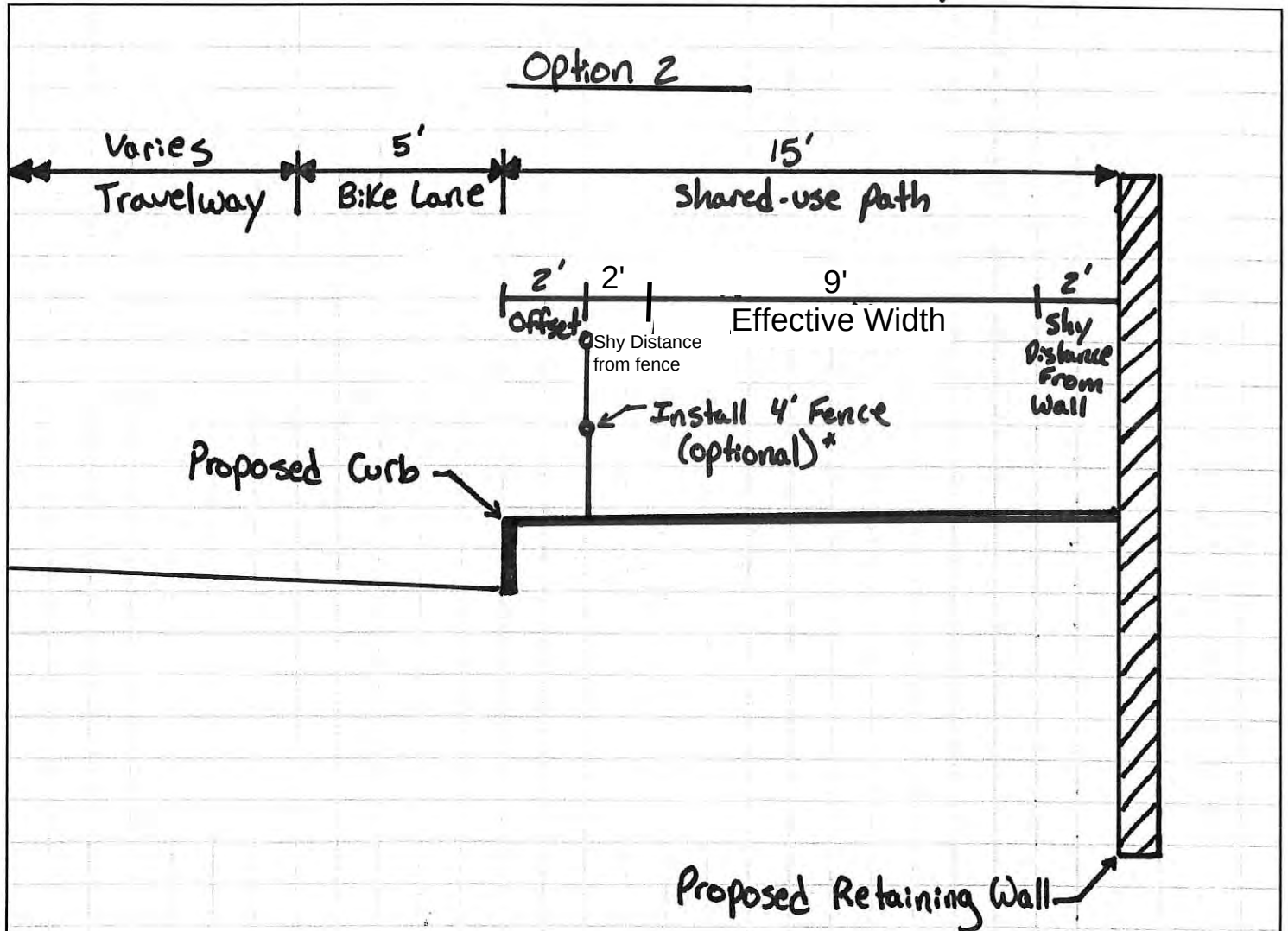
Notes

1. Landscaped Buffer could be Plantings or Cobblestones.
2. Proposed Lighting could be placed against the wall to illuminate the sidewalk & roadway
3. 3' Landscaped buffer could be removed in sections to provide Additional width around Poles.
4. The use of Cobblestones and Tree wells May provide a pleasing Aesthetic.



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JOB West Commercial Improvements
SHEET NO. 1 OF
CALCULATED BY J. Winchenbach DATE 4/6/2020
CHECKED BY DATE
SCALE Potential Layout Revisions



Notes:

1. The addition of a Fence would result in an 11' Effective width, While Maintaining a 2' shy Distance for Bicycles using the Proposed Bike Lane.
2. Ideally there would be no fence and have a 15' sidewalk
 - The Addition of Tree Wells could be proposed
 - * → Technically Need separation from Curb otherwise fence is required, City may Waive fence due to Aesthetics



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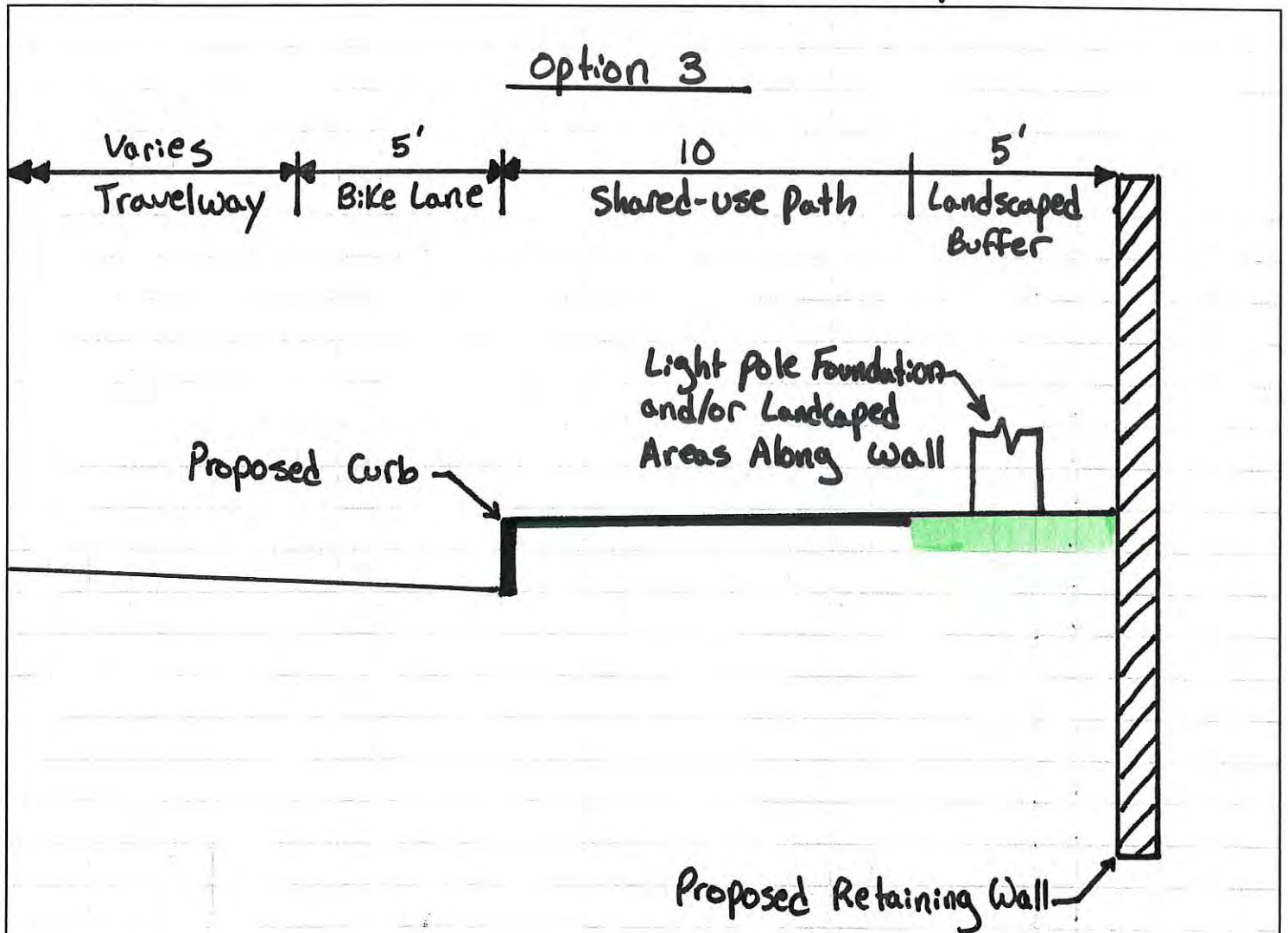
JOB West Commercial Improvements

SHEET NO. 1 OF

CALCULATED BY J. Winchenbach DATE 4/6/2020

CHECKED BY DATE

SCALE Potential Layout Revisions



Notes:

1. The city would need to waive the 5' separation between Curb and the proposed path.
2. Provides space for Light poles/Benches/Landscaping at the back of the path.

SECTION 12

STORMWATER MANAGEMENT REPORT

**VA CLINIC
113 WEST COMMERCIAL STREET
PORTLAND, MAINE**

Prepared for

**FDS JBB Portland LLC
10 Free Street
Portland, Maine 04101**

Prepared by

**Gorrill Palmer
707 Sable Oaks Drive – Suite 30
South Portland, Maine 04106
207.772.2515**

January 2020

STORMWATER MANAGEMENT REPORT

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12.1	Existing Site Conditions	1
12.2	Proposed Site Conditions.....	3
12.3	References	5
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12.6	Description of Site Watershed Models.....	7
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12.9	Stormwater Management Summary.....	12
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12.11	Maintenance of Facilities	15
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Figures

- W-1 Pre development Watershed Map
- W-2 Post development Watershed Map

Attachments

- A Pre development Runoff Calculations
- B Post development Runoff Calculations
- C Water Quality Calculations
- D FocalPoint® Design Worksheet/Checklist
- E Geotechnical Report
- F Operation & Maintenance Manual

12.0 **Introduction**

FDS JBB Portland LLC is proposing to construct a Community Based Outpatient Clinic within a portion of property located at 113 West Commercial Street in Portland, ME. The facility will serve as a VA Outpatient Clinic and will be referred to in this report as the “VA Clinic”. The property being developed is approximately 8.40 acres. The development will consist of the following:

- A 34,155 SF footprint, two-story outpatient facility (total GLA = 62,300 SF); and
- A 35,880 SF footprint, multi-level parking structure for 382 spaces, with a 150 space, surface parking lot.

The purpose of this analysis and report is to document what measures will be implemented to provide stormwater management for the project, what is required to control the peak rate of discharge during large storm events, and to provide treatment to stormwater runoff as determined by MaineDEP’s Chapter 500 Rules and City of Portland Technical Standards for Stormwater Management. Both the impact on peak rates of runoff and water quality measures are considered in this evaluation.

Erosion and Sedimentation Controls (Basic Standards) will be employed during the construction of this project and are summarized in the Erosion and Sedimentation Control Plans provided on Sheets C-5.3, C-10.5, and C-10.6.

12.1 **Existing Site Conditions**

The project site is bounded to the south by West Commercial Street/U.S. Route 1A; to the east by the Star Match Building site and undeveloped Emery Street Right of Way; to the north by the West End residential neighborhood on Danforth Street; and to the west by undeveloped land and a currently vacant Restaurant site (formerly Bennie’s Clam Shack). The property has approximately 1395’± of frontage on West Commercial Street and is directly across the street from the Portland Yacht Services/Canal Landing property that is on the Fore River. The property was once the site of the rail yard for the historic Portland Star Match Building which was built in 1870¹. Up to as many as nine rail spurs operated on the site at least to the early 1900’s, with continued use of the tracks and yard for the storage of iron and steel occurring thru the late 1960’s. Today, one disconnected rail spur is still present and various remnant railroad ties are visible on the ground surface across the site. The site today is mostly characterized by tall grasses and brush on the south side with thinly wooded area and brush on the northern side of the site.

West Commercial Street is a major artery into the Portland peninsula and Old Port District. It also contains major utilities that service the surrounding area. These include a 115 kV underground electric transmission line, 3-phase overhead electric and communications facilities, and the 48” Fore River Interceptor sanitary sewer line that runs along the property frontage. A 10” high-pressure natural gas main and 16” Portland Water District water main are also located in West Commercial Street, but are not located directly along the property frontage. A 36” combined sewer line, that serves the West End neighborhood, flows through the Emery Street Right of Way from North to South and connects to a diversion structure on the south side of West Commercial Street. These utilities are identified on the Existing Conditions and Removals Plan, Sheet C-3.0.

¹ See Phase 1 Environmental Site Assessment by S.W. Cole dated September 3, 2019.

Topography on the site generally slopes from north to south, towards West Commercial Street and, ultimately, the Fore River. The northern portion of the site is characterized by an approximately 75' embankment with naturally vegetated steep slopes (2H:1V) or greater in most areas. At the toe of the existing slope, the site levels off and has shallow slopes ranging from 1% to 2% from north to south. The distance from the toe of slope to the south property line is approximately 150' in most areas and decreases in both the east and west ends of the site. The flatter portions of the site will be the primary area of development. Runoff emanating from the site generally sheet flows from north to south across the old rail yard towards West Commercial Street, as the grade from east to west stays fairly constant.

West Commercial Street has a vertical sag curve in front of the property that is centered approximately 550'± east of the south-west property corner. The low point in the street is at roughly elevation 15' (NGVD29). An existing catch basin that collects runoff from the road and site is located along the north gutter line in the roadway sag. Water flows to this catch basin from the east at a high point in the road near the south-east property corner and from the west starting at a catch basin located in the gutter line approximately 400'± westerly. Although the grade along the road is 1% to 2%, this amounts to a change in grade of approximately 8'± from the sag curve to the high point at the southeast property corner. The grade across the site is relatively flat from the high point at the southeast corner and stays constant across the site at around elevation 21' to 23' (NGVD29) as the road trends downwards. Therefore, the developable site area is approximately 8'± above the grade at the sag in the road at the maximum. There is no curb along this portion of West Commercial Street, but a grassed slope extends from the edge of pavement up to the flatter area of the site. This change in grade transitions from relatively flat to steep (2:1±) in the area of the catch basin and roadway sag.

The USDA NRCS Medium Intensity Soil Survey identifies the site soils to be comprised of the following:

Table 1 USDA Soils		
Soil Type	Soil Description	Hydrologic Group
Cut and Fill Land	Silt Loam, 3 to 8 percent slopes	N/A
Hinckley	Loamy Sand, 3 to 8 percent slopes	A
Hinckley	Loamy Sand, 15 to 25 percent slopes	A

The majority of the development is located on cut and fill land, which is considered to have low susceptibility to erosion and is somewhat moderately well drained. According to the Environmental Site Assessment investigation and geotechnical investigation² the site consists of uncontrolled fills overlying native deposits of interlayered sandy soils and clay-silt soils, overlying native sands, overlying native sand and gravel. Groundwater was identified at depths of 10 feet below grade to 26 feet below grade, thus it is believed that groundwater will not be a substantive design or construction issue. Construction dewatering is expected to be limited, if needed at all. This is consistent with historical information in which West Commercial Street was created on landfill, including the subject property. The embankment on the north portion of the site is identified as Hinckley which is an "A" soil and is excessively draining. A geotechnical investigation was performed by Summit Geoengineering and their findings are consistent with these soils interpretations.

² See Geotechnical Report by Summit Geoengineering Services November 8, 2019.

There are three primary points of interest for this analysis:

1. The first is through the existing catch basin located in the gutter line 400' west of the sag curve in West Commercial Street, identified as Point of Interest #1 on the accompanying watershed maps. This catch basin is part of a small closed drainage system that ties into the nearby CSO line that extends down the Hill from Danforth Street, along an extension of Vaughn Street to West Commercial. There is a regulator structure for the Fore River Interceptor and a CSO outfall to the Fore River. It is believed the Catch basin ties into the CSO line and any water from the catch basin flows to the Fore River outfall.
2. The second Point of Interest is the existing catch basin located in the sag curve, identified as POI #2. The background associated with this catch basin is limited based on correspondence and requests for information Gorrill Palmer has exchanged with the City's DPW archivist. Various historical plans suggest that the two catch basins at the West Commercial Street sag may tie into a remnant drainage pipe that extended across what is now the Canal Landing Boat yard and discharged to the Fore River.³ Further exploration and coordination with DPW is required to better understand these current street conditions.
3. The third point of analysis is at the gutter line along the frontage of the southeast corner of the site, identified as the Point of Interest #3. POI #3 connects to the 48" Fore River Interceptor Sewer, with flows continuing to the wastewater treatment plant or as overflow thru a number of CSO regulator/overflow structures that discharge to the Fore River. Two CSO's are located in the vicinity of the site; these are believed to be CSO 028 at Emery Street and CSO 029 – Commercial Street.⁴

12.2 **Proposed Site Conditions**

The proposed project design contemplates the existing soils, topography, local ordinances, and other applicable design standards. The VA Clinic development will consist of a 34,155 SF, two-story outpatient facility and a 35,880 SF, multi-level parking structure placed along the southern property line. The site will have three driveways with access to West Commercial Street. The main entrance/patient drop-off will be placed in between the two structures, approximately 370'± west of the southeast property corner. The other two driveways are placed at the west and east ends of the site and provide access for staff and patients/visitors, respectively. The proposed site conditions will include building rooftop, bituminous pavement including both Standard and Heavy-Duty pavement and areas of porous pavement sections, CIP concrete and landscaped areas.

As part of the City of Portland's sidewalk development program, a 10' wide multi-use sidewalk with a 5' grassed esplanade will be constructed in the right of way along the property frontage. This will also include adding vertical granite curb to the roadway. For this analysis, the associated area in the right of way that would not have otherwise been developed for the VA clinic project was not included in the calculations when determining required water quality treatment percentages. This area is defined in the calculation's summaries, as the sidewalk corridor in the West Commercial Street Right of Way along the property frontage, other than driveways associated with the VA Clinic. It was, however, modeled for flood control purposes, as it will ultimately contribute to the developed peak flow to each point of interest. **Overall, the VA Clinic development will create**

³ See City DPW archives 00652_001_001 Right of Way Track and Map Portland Terminal, June 30, 1916 V-I-D/2-T

⁴ See reports contained in <https://www.portlandmaine.gov/1835/Reports-and-Assessments>

approximately 3.95 acres of impervious area and 4.72 acres of developed area within the property boundary. The sidewalk development will create an additional 0.327 acres of impervious area and 0.485 acres of developed area within the West Commercial Street Right of Way.

The site will generally be graded to follow the existing topography, high in the north and draining south towards the three points of analysis along the property frontage in West Commercial Street. As part of the VA Clinic development the entire flat area up to the embankment, in the center of the site, will be grubbed and cleared. Excavation activity in this area will be subject to requirements set forth in a Site-Specific Environmental Media Management Plan to be prepared by S.W. Cole Engineering. The expected goals and objectives of the plan will be to retain all onsite soils containing ash, onsite. Clean soils (typically found greater than 2 feet below ground surface) may be exported or reused onsite. Ash containing soils will require a cover system consisting of concrete; asphalt or 12" to 24" of clean borrow/topsoil. The embankment to the north will be partially excavated to make way for the north side of the parking garage and an access drive around the garage. This area will require a retaining wall installed in the northeast corner of the site. A short retaining wall will also be installed on the back of the 10' sidewalk in order to overcome the grade difference between the site and West Commercial Street. The site is graded to have elevations similar to, or just above, existing grade to blend with the site topography and access grades at each of the driveways.

The porous pavement surface parking for 150 parking spaces will be located on the western portion of the property. An access drive/fire lane will be installed that will navigate through the rear of the site and connect the west and east entrances for emergency vehicles, delivery vehicles and other larger vehicles that need to access the rear of the buildings. The main entrance will consist of separated entry and exit lanes. There will be a 14' wide entrance lane and two 11' wide exit lanes for right and left turning exiting movements. The entrance will transition into a roundabout whereupon entering vehicles may enter the parking structure, or continue around to drop-off/pick-up patients. The main entrance will have access to the rear access drive but only for emergency vehicles and for snow removal. Pedestrian access will be provided to the proposed pathway sidewalk in the front of the property on both sides of the VA Clinic and from the parking structure. Seating areas have been provided around the main entrance and staff entrance to the VA Clinic as well.

Stormwater on the site will be collected by utilizing sheet flow and collected flow from catch basins and piped roof drains. The majority of the surface parking area on the west end will benefit from the use of porous asphalt pavement. The porous pavement system consists of porous asphalt placed over a multi-layer section of various aggregates for runoff storage and a filtering course all underlain by a collection layer. We are proposing an unlined system to allow some amount of runoff infiltration below since the existing site soils are very granular in nature and the groundwater is relatively deep across the site. This pavement section will contribute to both water quality treatment and quantity collection and control of stormwater runoff from the parking lot. An underground sand filter system with proprietary below grade storage will also be provided behind the buildings for the treatment and storage of runoff from the building roofs. A closed drainage system will collect runoff from the site and connect into the existing catch basin located in the vertical sag curve in West Commercial Street. A shallow swale will be graded on the toe of the northern embankment to collect runoff from the area to the north and redirect it around the site as the development footprint will interrupt this flow path. Other areas on the perimeter of the site will utilize existing topography to maintain flow to the same three points of analysis as the Pre-Developed condition.

12.3 References

The following reference sources were reviewed during preparation of the stormwater analysis:

1. Hydraulic Engineering Circular No. 22, Second Edition – Urban Drainage Design Manual, U.S. Department of Transportation, August 2001.
2. AASHTO Model Drainage Manual, American Association of State Highway and Transportation, 1991.
3. Hydraulic Engineering Circular No. 14 - Hydraulic Design of Energy Dissipators for Culverts and Channel, U.S. Department of Transportation, September 1983.
4. Maine Erosion and Sedimentation Control Handbook for Construction: Best Management Practices, MaineDEP, current edition.
5. Best Management Practices for Erosion and Sediment Control, U.S. Department of Transportation, June 1995.
6. Municipal Stormwater Management – Second Edition, Thomas N. Debo, Andrew J. Reese, 2003.
7. Handbook of Applied Hydrology, Chow, 1964.
8. Technical Release Number 55 – Urban Hydrology for Small Watersheds, USDA Soil Conservation Service, June 1986.
9. Stormwater Management for Maine, Volume III BMPS Technical Design Manual, MeDEP, January 2006.
10. Technical Release Number 20 – Computer Program for Project Formulation – Hydrology, USDA Soil Conservation Service, May 1983.
11. Section 4 – Hydrology, USDA Soil Conservation Service, March 1985.
12. Technical Release Number 55 – Urban Hydrology for Small Watersheds, USDA Soil Conservation Service, June 1986.

The following sources were used for preparation of the VA Clinic stormwater quality analysis:

1. Stormwater Management for Maine, Volume III BMPS Technical Design Manual, MaineDEP, May 2016
2. A Current Assessment of Urban Best Management Practices, Techniques for Reducing Non-point Source Pollution in the Coastal Zone, U.S.E.P.A. Office of Watersheds, March 1992.
3. MeDEP Chapter 500, Stormwater Management Rules.

Computer programs used to assist in the various components of this analysis include:

1. HydroCAD 10.00, HydroCAD Software Solutions LLC – used for modeling watersheds for pre and post development conditions.
2. Microsoft Excel, Microsoft Corporation – used for spreadsheet computations.
3. AutoCAD Civil 3D 2019, Autodesk - used to determine areas and graphical representation of design.

Data resources used to obtain the hydrologic input data for the stormwater models are identified later in this report.

12.4 Overview of Stormwater Runoff Modeling

The stormwater analysis evaluates the following elements:

- Pre-development and post-development stormwater runoff and peak discharge rates;
- The impacts of the VA Clinic development and subsequent modification to site discharge rates and locations;
- The effect of land cover modifications within the VA Clinic, including some that are expected to increase site runoff rates;
- The requirements for stormwater management including compliance with Chapter 500 flooding standards;
- Storm drainage requirements for parking areas, roof areas and other improvements; and
- Requirements for water quality measures.

12.5 Methods of Analysis

12.5.1. Stormwater Quantity

The hydrologic analyses for predevelopment and post development conditions have been conducted based upon the methodology contained in the USDA Soil Conservation Service's Technical Releases No. 20 and 55 (SCS TR-20 and TR-55) as modified for special site conditions. For this section of Cumberland County, Maine, a 24-hour SCS Type III storm distribution was used for the analysis using the following storm frequencies and rainfall amounts:

Table 2	
Storm Event	24-Hour Rainfall
2-Year Storm	3.10
10-Year Storm	4.60
25-Year Storm	5.80

The HydroCAD computer program was used in the analysis. This program determines the critical points of the project watershed and uses SCS TR-20 methodology for evaluation of the anticipated conditions at these points.

Land use, cover, delineation of watershed sub-catchments, hydraulic flow paths, and hydrologic soil types were obtained using the following data:

1. Portland West, Maine USGS 7.5-minute Quadrangle Maps.
2. Cumberland County, USDA Medium Intensity Soils Survey.
3. Onsite Topographic Survey with 1-foot contour intervals prepared by Titcomb Associates, January 2016.

4. Boundary Survey by Titcomb Associates, November 2019.
5. The Class C Medium Intensity Soil Survey for the watershed areas.

12.5.2. Stormwater Quality

Water quality treatment for the development has been designed to meet the Stormwater Management Rules (Chapter 500) General Standard, which requires the treatment of at least 95% of impervious area and at least 80% of developed area generated.

12.6 Description of Site Watershed Models

The watershed models were developed to predict peak discharge rates at three points of analysis for the pre and post development conditions.

12.7 Predevelopment Conditions

The predevelopment conditions for this analysis were considered to be the original condition of the site as described in the Existing Site Conditions section above. We note that the historic use of the property, for perhaps at least a century or more, was as a rail siding with various sets of tracks and developed land area. Our analysis has not specifically accounted for those long-ago land uses on the site, including any levels of imperviousness attributable to the rail yard, including rail ties, yard area or other consolidated/packed surfaces. Point of analysis #3 ultimately connects to the Fore River Interceptor sewer pipe which normally drains to the wastewater treatment plant. During rainfall events, the catch basins at Points of interest #1 and #2 are believed to discharge to the Fore River via the combined sewer overflow to the west and a separate outfall, respectively. Figure W-1 depicts the three predevelopment watersheds and their corresponding hydrologic characteristics. It was determined in the medium intensity soil survey that the site contains cut and fill material⁵ which does not have a designated hydrologic soil group. For this analysis, the area of the site that was found to contain cut and fill material was chosen to be associated with soil group B.

Table 12-1 below summarizes the predevelopment hydrologic characteristics for each subarea.

Table 12-1			
Predevelopment Watersheds Hydrologic Characteristics			
Watershed #	Area(ac)	CN	Hydrologic Time Of Concentration
1S – Area in West of Property	2.590	72	12.9
2S – Area in Center of Property	15.868	70	17.8
3S – Area in East of Property	0.396	63	5.9
Total	18.854		

Points of Interest (POI) #1 and #2 are both catch basins in West Commercial Street. POI #1 is approximately 400' west and upgradient from POI #2 but they are separate closed systems according to the records we have obtained from the City records. However, in large storm events, flows that the catch basin at POI #1 cannot handle are likely to bypass the system and continue east down the gutter line and enter the catch basin in the roadway sag at POI #2. POI #3 is a point in the gutter line in front of the southeast property corner that flows east to an existing catch basin in front of

⁵ Indicative of the site's historic rail yard land use that involved manmade fill land and grading to accommodate multiple sets of tracks.

the Portland Star Match Building. The most important POI for this analysis is POI #2, which serves as the low point in the overall system and contributing area and will receive stormwater from the majority of the development. Our current understanding of the POI#2 location is unclear as to its discharge as our search thru available City archives has not provided definitive evidence of these site conditions. We are hopeful that City Staff may have a better opportunity to investigate these conditions as we proceed through the review process.

The Pre-Development HydroCAD model has been designed to demonstrate how stormwater flows to the three POI's and, more importantly, how POI #1 and POI #2 interact in large storm events. The catch basin of POI #2 has a 10" pipe outlet according to our survey information and that pipe may cross West Commercial Street and connect to another catch basin positioned on the south side of the street. The outfall of the existing catch basin on the south side of the street is not known. In recent storm events⁶, ponding has been observed above the catch basins at POI#1 and #2, mostly likely due to the following:

- High rainfall (>2")
- High tide conditions
- Recent temporary snow pile and construction conditions on the south side of the street within the Canal Landing site
- Inadequate capacity within the outfall pipe from the CB's at POI#2. As this pipe condition is not fully known and identified, we are uncertain as to the capacity.

For the purpose of this analysis, POI #2 was also modeled with a broad crested weir that represents the centerline crown in West Commercial Street that allows ponding in the model and helps gauge possible street surcharge conditions. The consideration of the street sag acting as a control relies on the assumption that water breaching the street is allowed to flow freely onto the property to the south side of the street (Canal Landing)⁷. Using this method, the HydroCAD model predicts street flooding under predevelopment conditions, similar to the anecdotal evidence of recent storm event observations. Table 12-2 below summarizes existing flow rates at POI #2 and the height of water over the crown in the road during the 2, 10, and 25-yr storm events:

Table 12-2			
Predevelopment Flow Rate & Ponding At POI #2			
Storm Event	Additional Flow From POI#1 (cfs)	Total Flow at POI#2 (cfs)	Depth of Water Overtopping Crown in Road (ft)
2-yr	0.00	0.92	0.00
10-yr	0.06	6.82	0.21
25-yr	0.23	14.90	0.36

As demonstrated in the Pre-Developed HydroCAD model for the 2-yr storm event, the catch basin at POI #1 does not send any additional flow to POI #2 and the catch basin at POI #2 is able to collect the contributing runoff without overtopping the crown in the road. In the 25-yr storm event (5.80" of rain), street ponding occurs and overtops the crown in the road approximately 4.32".

⁶ Peak rain event on December 14, 2019.

⁷ Historically we believe that the street has likely experienced routine periodic flooding and that water "escapes" the street by breaching onto the former rail yard (now Canal Landing) site and ultimately sheets across that property to the Fore River.

Although this seems unfavorable, we note that flooding similar to this is a common occurrence in areas around the shoreline and the Commercial Street corridor which has been observed in recent storm events. In this scenario the crown in the road overtops, stormwater flows toward the other catch basin or to the south side of the street and simply sheet flows to the Fore River, less than 300 feet away.

12.8 **Post-development Conditions**

In the developed condition, the VA Clinic will create 3.95 acres of new impervious area (including porous and regular pavement, concrete, and rooftop) and 4.72 acres of new overall developed area. Runoff from the development drains to three primary systems:

- A small portion of the proposed sidewalk will sheet flow to West Commercial Street and into the existing catch basin at POI #1.
- The majority of the onsite developed area will be captured through a new closed collection and pipe network consisting of several stormwater BMP's around the entire site. This system will connect to the existing catch basin and additional runoff from the proposed sidewalk in the street will drain to POI #2.
- A portion of the east driveway entrance and sidewalk will drain toward West Commercial Street and continue east along the gutter line into the existing catch basin downgradient of POI #3. There will be a reduction in the site's contributing area to POI#3 and thus less runoff reaching that POI.

Due to the size, length, and elevation constraints of the site, it was determined that traditional, centralized stormwater management approaches would not be ideal. Instead, several stormwater BMP's have been designed that will treat different portions of the site. These BMP's are utilized in order to provide proper treatment and storage. By providing BMP's throughout the site, overall time of concentrations for the subcatchments are small and have been modelled as direct entry in the Post-Development HydroCAD model.

Test pits and borings were taken in October 2019. The geotechnical report performed by Summit Geoengineering Services has been included in Section 11, Attachment E of this Application.

Figure W-2 depicts the post-development watershed conditions and the corresponding hydraulic properties. The post-development watershed model is similar to the predevelopment model in that the outlet points (POI's) are the same and can be compared directly. Within the model, the first number of the subcatchment ID corresponds to the point of interest that it flows to. The following is a listing of the watersheds associated with the proposed development.

Table 12-3			
Post-development Subcatchments Hydrologic Characteristics			
Subcatchment #	Area(ac)	CN	Hydrologic Time Of Concentration
1S – West Area	2.59	58	12.9
2S-A – Embankment	10.613	53	16.4
2S-B – West Driveway	0.058	72	5.0

Table 12-3 Post-development Subcatchments Hydrologic Characteristics			
Subcatchment #	Area(ac)	CN	Hydrologic Time Of Concentration
2S-C – West Parking	1.546	94	5.0
2S-D – Loading Dock	0.033	98	5.0
2S-E – Rooftop & East Side	2.466	95	5.0
2S-F – Frontage/ROW	1.396	90	12.3
3S – East Area	0.152	84	5.0
Total	18.854		

In the post-developed condition, subcatchment group 1S has stayed the same with the exception of approximately 1,260 SF of impervious area and 1,200 SF of landscaped area associated with the sidewalk development. Subcatchment 2S's overall area increased to 16.112 acres from 15.868 acres. Subcatchment group 3S decreased to 0.152 acres from 0.396 acres due to the development of the east entrance which is being captured and treated in Subcatchment 2S-E.

The design includes specific onsite measures for the retention of stormwater runoff attributable to the development. These include an underground storage system behind the proposed buildings that will serve to store and treat roof runoff and a smaller percentage of yard areas. The proposed parking lot will also consist of a porous asphalt pavement section that will contain a 12" layer of clean crushed stone. Based on a 40% void ratio in the stone, its storage capacity is approximately 4.8" of runoff. These storage volumes have been accounted for in the accompanying post-development analysis.

The following table reflects the pre- and post-development peak rates of runoff at the three points of interest:

Table 12-4 Comparison of Peak Discharge Rates at Points of Interest Pre-Development to Post-Development			
Storm Event & Condition	POI #1 (cfs)	POI #2 (cfs)	POI #3 (cfs)
2-Yr Predevelopment	0.30	0.92	0.15
2-Yr Post Development	0.30	4.69	0.29
Change in 2-Yr Peak Discharge Rate	0.00	+3.37	+0.14
10-Yr Predevelopment	1.71	6.82	0.53
10-Yr Post Development	1.71	13.74	0.52
Change in 10-Yr Peak Discharge Rate	0.00	+6.92	-0.01
25-Yr Predevelopment	3.37	14.90	0.90
25-Yr Post Development	3.37	20.95	0.71
Change in 25-Yr Peak Discharge Rate	0.00	+6.05	-0.19

The summary table shows that peak discharge at POI#2 increases in the post development analysis. This is not solely because of the VA Clinic development. Several other factors lead to the calculated increase in peak flow at the POI #2. The entire site developed area is 4.72 acres but the entire area

for subcatchment group 2S is actually 16.111 acres in the post-developed condition, which is a small increase in overall watershed area to POI#2. This additional land that contributes to POI #2 comes from two main areas; the right of way in the front of the property and the steep northern embankment and residential area to the north of the site, off Danforth Street. By developing the site, the runoff that flows down the embankment from the north has to be collected at the toe of slope and redirected around the site in a closed system. This action theoretically decreases the time of concentration in the post-developed condition and, subsequently, yields a higher peak rate of discharge associated with an area that will remain undeveloped. Simply put, runoff from the hillside and rear yards of the house lots off Danforth Street used to cross the flat lower section of the development site and that increased the travel time and lowered the runoff rate to the point of interest in the predevelopment condition. By eliminating the lower flat portion of the runoff travel path and effectively collecting the runoff in a pipe system, the travel time to the POI is reduced and the resultant model shows increased runoff and peak discharge to the POI.

In order to properly model the post-development condition, the sidewalk development in the right of way was included in the HydroCAD model. This also increases the amount of runoff that reaches all of the Points of Interest. Land cover types for subcatchment 1S in the pre- and post-developed condition stayed the same except for area associated with the sidewalk. However, the small amount of area from the sidewalk compared to the existing subcatchment resulted in no change from pre- to post-developed conditions. Subcatchment 2S contains the largest portion of the sidewalk development; totaling approximately 18,120 SF of developed area. Subcatchment 3S decreases in total area from the pre- to post-developed condition and peak discharges decrease in the 10- and 25-yr storm events but insignificantly increases in the 2-yr event. Without the additional sidewalk area that drains to POI #3, the post-developed 2-yr peak discharge would be less than the pre-developed condition. Alternatives were evaluated to attempt to capture, treat, and store the runoff generated by the sidewalk. This was found to be unfeasible due to the lack of space in the right of way and the presence of several utilities located in the right of way currently that would conflict with any stormwater management BMP's. Most importantly, this includes an underground 115KVA power transmission line.

In the pre-developed condition, it was determined that ponding occurs above the catch basin at POI #2. This has also been observed by GP personnel in the field. Table 12-2, above, demonstrated the relationship between the catch basins at POI #1 and POI #2 and the depth of street flooding for the associated storm events. Table 12-5, below, compares the depth of ponding and difference in peak discharge at POI #2 between the pre- and post-developed conditions:

Table 12-5						
Pre- and Post-Development Flow Rate Difference & Ponding At POI #2						
Storm Event	Difference in Flow From POI #1 (cfs)	Difference in Total Flow at POI #2 (cfs)	Depth of Water Overtopping Crown in Road (ft)		Difference in Depth of Water Overtopping Crown in Road	
			Pre	Post	in.	ft
2-yr	0.00	+3.37	0.00	0.13	+1.63	+0.13
10-yr	+0.03	+6.92	0.21	0.34	+1.63	+0.13
25-yr	+0.09	+6.05	0.36	0.43	+0.875	+0.07

This is an important comparison to make because, although the peak flow rates increase for all storm events at POI #2, the depth of water that is ponding only increases by 1.63" in the 2- and 10-yr storm event, and 0.875" in the 25-yr storm events. Generally speaking, in both the pre- or post-developed conditions, ponding is occurring at this location. As previously explained, stormwater generated on and off site ultimately discharges to the Fore River. Because of this fact, and the other factors explained above, **we are requesting a waiver from the Flooding Standard.**

12.9 Stormwater Management Summary

Under the General Standards, the project is required to meet the BMP Standards, as the development site is not tributary to a lake watershed. The project contains new construction that will also be required to meet the treatment standards of Chapter 500. The following sections summarize the BMP's that are being employed to meet the water quantity and quality standards for the proposed development.

12.9.1. Porous Pavement

Underdrained porous asphalt pavement will be installed in all of the parking spaces on the west side of the VA Clinic building and a portion of the drive aisles. Direct absorption or sheet flow from adjacent areas will flow down through the porous pavement and through a sand filter section before being collected in underdrain pipes that will connect to the closed collection system that ultimately connects to the existing catch basin at POI #2. The porous pavement filter section was designed in accordance with Section 7.7 of the BMPS Technical Design Manual dated May 2016. We propose to not place a liner under the system, thus allowing some amount of infiltration into the native soils below, principally as these soils are granular in nature, the groundwater depth is greater than 5' below the bottom of the system and there are no specific groundwater resource concerns as the site is so proximate to the Fore River and tidal (saltwater) conditions.

In the HydroCAD model, the porous pavement filter is labeled as Pond 2P – Porous Pavement. The porous pavement filter area is oversized for the tributary area draining to it and exceeds the standard for 20% of the contributing area running onto it. It should be noted that the stone storage section will also be constructed underneath the heavy-duty pavement section for ease of construction and continuity in the drainage section. This, along with the oversized filter area, provides a water quality volume that treats more than the first two inches of runoff which in turn controls additional flow for flood control purposes. The reservoir layer contains 4" overflow pipes that will connect to a storm drain collection line on the south side of the parking lot. An orifice will control the release of stormwater from the porous pavement area such that the area will drain dry between 24-48hrs.

In total, the porous pavement will provide treatment for 1.387 acres of impervious area and 1.546 acres of developed area. Design calculations for the porous pavement filter are included in Attachment C.

12.9.2. Subsurface Sand Filter

A subsurface sand filter with R-Tank® storage above will be installed underneath the rear access drive. It will treat water from both building rooftops, and impervious and landscaped area in the main entrance and rear access drive. Roof drain leaders will pipe directly into the system from the buildings. Additional runoff will sheet flow into catch basins that will

discharge into the system. Initial stormwater flows will enter the pretreatment rows of the system. From there it will flow into the rest of the reservoir layer that is sized for the water quality volume. Stormwater will then flow vertically through a sand filter section before being collected in underdrain pipes that connect to the closed conveyance system that ultimately drains to the catch basin in West Commercial Street at POI #2. The subsurface sand filter section was designed in accordance with Section 7.3 of the BMP's Technical Design Manual dated May 2016 and the DEP approval letter for the R-Tank dated January 11, 2019.⁸

In the Post-developed HydroCAD model, this BMP is labeled as Pond 4P - Subsurface Sand Filter. This specific configuration of subsurface sand filter uses a MaineDEP approved R-Tank® storage system above the sand filter, rather than below. The storage volume provided is equal to the water quality volume, which is the volume associated with 1" of rain contributing from impervious areas and 0.4" of rain from landscaped areas. Outlet control structures at each end of the system will allow water to flow into the pretreatment rows in the system first. The structures at the inlet to the system will also have weirs set at the defined water quality volume elevation, so that excess flow bypasses the system and flows to the closed conveyance system. An orifice will control the release of stormwater from the subsurface sand filter area such that the area will drain dry between 24-48 hrs.

In total, the subsurface sand filter will provide treatment for 2.272 acres of impervious area and 2.466 acres of developed area. Design calculations for the subsurface sand filter are included in Attachment C.

12.9.3. FocalPoint® Modular Biofiltration System

A FocalPoint® system⁹ will be employed to provide quality treatment for a small portion of the west driveway entrance and landscaped area. The system consists of a shallow (6-12") depression filled with 18" of a soil filter media and planted with a variety of grasses and shrubs. Runoff entering the cell is detained temporarily before passing through the filter media. The filter media has a high flow rate (100 in/hr) that allows high amounts of runoff to be handled in a smaller footprint. The stormwater is then controlled below the filter section with a chamber storage system before being released downstream to a treatment row. An underdrain pipe then collects and discharges the stormwater from the system and connects to the site's closed conveyance system that discharges to POI#2. An overflow standpipe with a beehive grate is set approximately 6" above the filter bed and captures stormwater that cannot be handled in larger storm events.

The FocalPoint® will provide treatment for 0.018 acres of impervious area and 0.058 acres of developed area. Design calculations for the FocalPoint® Bio-filtration system are provided in Attachment D of this Application.

12.10 Water Quality Summary

The construction of BMP's employed as part of the development will help to treat the stormwater generated from the development as much as practically possible. The porous pavement, subsurface sand filter, and FocalPoint® successfully treat approximately 3.68 acres of impervious area and 4.04

⁸ See letter from Mark Bergeron to ACF Environmental, January 11, 2019 available at <https://www.maine.gov/dep/land/stormwater/stormwaterbmps/manufactured-systems/R-Tank%20approval%20letter.pdf>

⁹ See <https://www.maine.gov/dep/land/stormwater/stormwaterbmps/manufactured-systems/focalpoint-january2017.pdf>

acres of developed area. This equates to overall treatment percentages of 93.16% and 85.59% for impervious and developed area, respectively. Table 12-6, below, demonstrates the treated impervious and developed areas by percentage for each BMP employed:

	Table 12-6 Treatment Percentage by BMP			
	Porous Pavement	Subsurface Sand Filter	FocalPoint	Total
Impervious	35.19%	57.51%	0.46%	93.16%
Developed	32.76%	51.61%	1.22%	85.59%

It was realized that, due to the site being raised above West Commercial Street, approximately 0.234 acres of the driveways and other impervious area along the property frontage would not be treatable due to the slopes and presence of utilities in the right of way. Similarly, the proposed loading dock truck well is not treated by the aforementioned BMP's. These impervious areas represent approximately 5.92% of the total impervious area and, therefore, the overall treatment percentage for impervious areas fall slightly below the 95% treatment standard. The overall developed area treatment is 85.6% which exceeds the required developed area treatment standard of 80%.

In an effort to increase the overall treatment of the impervious areas, two additional measures have been considered. The first is a catch basin filter cartridge¹⁰ insert that would be installed in the loading dock catch basin. This will treat an additional 1,445 SF. Treating the area tributary to the loading dock increases the overall impervious treatment percentage to 93.95%. The second measure to improve overall impervious area treatment was the increase in water quality volume provided in the porous pavement section. In order to offset the small amount of impervious area not treated to meet the standard of 95%, the porous pavement section will contain a water quality volume that will provide storage to treat 2" of runoff from the impervious area and 0.8" of runoff from the landscaped area. By treating twice the amount required for an area approximately 1.55 acres in area, it is our opinion that this will provide satisfactory treatment of the stormwater runoff that is generated by the VA Clinic Development. The proposal to increase the runoff treatment depth is consistent with Chapter 500, Part 4.C (2) (a) (ii).

Water Quality Calculations that demonstrate the compliance with Chapter 500 for the VA Clinic development are provided in Attachment C. A summary of the calculations is provided below:

VA Clinic Treatment Summary

Total Impervious Area =	3.95 acres
Total Developed Area =	4.72 acres
Impervious Area Treated =	3.71 acres
Percent Impervious Area Treated =	93.95%*
Developed Area Treated =	4.07 acres
Percent Developed Area Treated =	86.30%

*(Standard met by increasing treatment depth in the Porous Asphalt zones and employing a catch basin filter cartridge in the loading dock truck well)

¹⁰ Filter cartridge by Fabco Industries Inc. – www.fabco-industries.com

12.11 Maintenance of Facilities

The stormwater management facilities will be maintained by the Applicant or their assigns after construction is completed. The general contractor will be responsible for maintenance during construction. The contract documents will require that the contractor designate a person for maintenance of the facilities during construction as required by this application. Long-term operation/maintenance schedules for the facilities are provided in the O&M Manual included in Attachment F to this report.

12.12 Conclusions

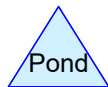
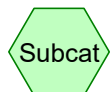
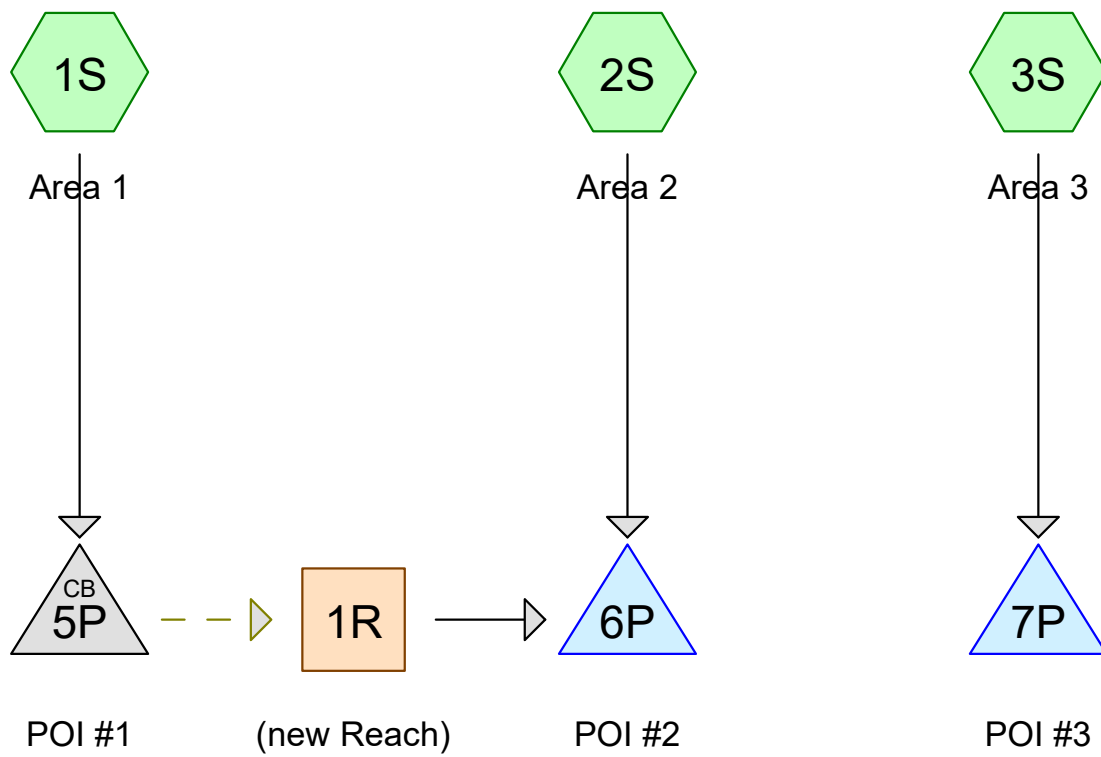
The Stormwater Management Plan for this project outlines the measures proposed to achieve compliance with the Chapter 500 Stormwater Management standards for water quality treatment. The design includes stormwater quantity controls including storage components within the porous pavement cross section and within the roof drainage sand filter system. The site will discharge to a municipal system that outflows to the Fore River which is major river segment that is under tidal influence, thus the applicant is seeking a waiver of the flooding standards. The majority of the proposed development will be tributary to one closed storm drain system with one point of discharge. A minor amount of development area will direct runoff to two other discharge locations within the municipal street system and these impacts are considered insignificant.

Based on the proposed design, the runoff from the proposed development will be captured and conveyed in a manner that will not have an adverse impact to the surrounding stormwater systems or the environment.

WATERSHED MAPS

ATTACHMENT A

Predevelopment Runoff Calculations



Routing Diagram for 3572_pre-dev

Prepared by {enter your company name here}, Printed 1/13/2020
HydroCAD® 10.00-22 s/n 01265 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.139	49	50-75% Grass cover, Fair, HSG A (1S, 2S)
1.553	69	50-75% Grass cover, Fair, HSG B (1S, 2S, 3S)
2.736	56	Brush, Fair, HSG B (2S, 3S)
1.265	98	Paved roads w/curbs & sewers, HSG B (1S, 2S, 3S)
1.656	98	Unconnected roofs, HSG B (1S, 2S)
7.331	43	Woods/grass comb., Fair, HSG A (1S, 2S)
0.174	65	Woods/grass comb., Fair, HSG B (3S)

Summary for Subcatchment 1S: Area 1

Runoff = 0.30 cfs @ 12.41 hrs, Volume= 0.051 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.512	69		50-75% Grass cover, Fair, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.171			83.82% Pervious Area
0.419			16.18% Impervious Area
0.142			33.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 0.92 cfs @ 12.56 hrs, Volume= 0.212 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Adj	Description
6.111	43		Woods/grass comb., Fair, HSG A
0.963	98		Paved roads w/curbs & sewers, HSG B
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
2.565	56		Brush, Fair, HSG B
1.015	69		50-75% Grass cover, Fair, HSG B
15.868	57	54	Weighted Average, UI Adjusted
13.391			84.39% Pervious Area
2.477			15.61% Impervious Area
1.514			61.12% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
2.9	150	0.0150	0.86		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
2.1	360	0.0200	2.87		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
17.8	890	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.15 cfs @ 12.12 hrs, Volume= 0.014 af, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
0.174	65	Woods/grass comb., Fair, HSG B
0.025	98	Paved roads w/curbs & sewers, HSG B
0.171	56	Brush, Fair, HSG B
0.026	69	50-75% Grass cover, Fair, HSG B
0.396	63	Weighted Average
0.371		93.69% Pervious Area
0.025		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Wooded Embankment
					Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	150	0.0300	1.21		Shallow Concentrated Flow, Across Grass/Brush Field
					Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, west commercial street
					Paved Kv= 20.3 fps
5.9	250	Total			

Summary for Reach 1R: (new Reach)

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

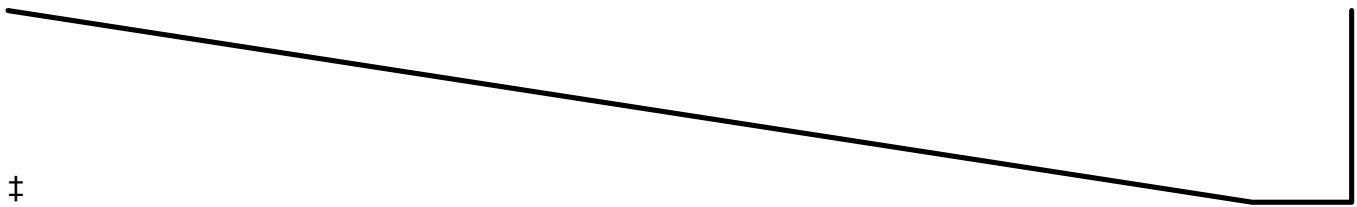
Bank-Full Depth= 1.00' Flow Area= 29.0 sf, Capacity= 134.15 cfs

4.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 0.0 '/' Top Width= 54.00'

Length= 400.0' Slope= 0.0058 '/'

Inlet Invert= 17.17', Outlet Invert= 14.84'



Summary for Pond 5P: POI #1

Inflow Area = 2.590 ac, 16.18% Impervious, Inflow Depth > 0.23" for 2 Year event
 Inflow = 0.30 cfs @ 12.41 hrs, Volume= 0.051 af
 Outflow = 0.30 cfs @ 12.41 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.30 cfs @ 12.41 hrs, Volume= 0.051 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 17.22' @ 12.41 hrs

Device	Routing	Invert	Outlet Devices
#1	Device 3	17.17'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Tertiary	17.25'	2.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	14.00'	12.0" Round Culvert L= 160.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.00' / 10.70' S= 0.0206 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=0.30 cfs @ 12.41 hrs HW=17.22' (Free Discharge)

↑ **3=Culvert** (Passes 0.30 cfs of 4.92 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 0.30 cfs @ 0.74 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: POI #2

Inflow Area = 15.868 ac, 15.61% Impervious, Inflow Depth > 0.16" for 2 Year event
 Inflow = 0.92 cfs @ 12.56 hrs, Volume= 0.212 af
 Outflow = 0.92 cfs @ 12.56 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.92 cfs @ 12.56 hrs, Volume= 0.212 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 14.95' @ 12.56 hrs Surf.Area= 60 sf Storage= 3 cf

Plug-Flow detention time= 0.0 min calculated for 0.212 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (906.9 - 906.8)

Volume	Invert	Avail.Storage	Storage Description
#1	14.84'	2,089 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.84	4	0	0
14.94	50	3	3
15.04	185	12	14
15.14	450	32	46
15.24	870	66	112
15.34	1,430	115	227
15.44	2,285	186	413
15.54	3,157	272	685
15.64	4,217	369	1,054
15.74	5,118	467	1,521
15.84	6,256	569	2,089

Device	Routing	Invert	Outlet Devices
#1	Device 3	14.84'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	15.24'	178.0 deg x 0.1' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)
#3	Primary	11.50'	10.0" Round Culvert L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.10' S= 0.0091 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=0.92 cfs @ 12.56 hrs HW=14.95' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
 ↑ **3=Culvert** (Passes 0.92 cfs of 3.61 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 0.92 cfs @ 1.07 fps)

Summary for Pond 7P: POI #3

Inflow Area = 0.396 ac, 6.31% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 0.15 cfs @ 12.12 hrs, Volume= 0.014 af
Primary = 0.15 cfs @ 12.12 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Area 1

Runoff = 1.71 cfs @ 12.22 hrs, Volume= 0.172 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.512	69		50-75% Grass cover, Fair, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.171			83.82% Pervious Area
0.419			16.18% Impervious Area
0.142			33.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 6.82 cfs @ 12.33 hrs, Volume= 0.850 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Adj	Description
6.111	43		Woods/grass comb., Fair, HSG A
0.963	98		Paved roads w/curbs & sewers, HSG B
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
2.565	56		Brush, Fair, HSG B
1.015	69		50-75% Grass cover, Fair, HSG B
15.868	57	54	Weighted Average, UI Adjusted
13.391			84.39% Pervious Area
2.477			15.61% Impervious Area
1.514			61.12% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
2.9	150	0.0150	0.86		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
2.1	360	0.0200	2.87		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
17.8	890	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.53 cfs @ 12.10 hrs, Volume= 0.038 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
0.174	65	Woods/grass comb., Fair, HSG B
0.025	98	Paved roads w/curbs & sewers, HSG B
0.171	56	Brush, Fair, HSG B
0.026	69	50-75% Grass cover, Fair, HSG B
0.396	63	Weighted Average
0.371		93.69% Pervious Area
0.025		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Wooded Embankment
					Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	150	0.0300	1.21		Shallow Concentrated Flow, Across Grass/Brush Field
					Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, west commercial street
					Paved Kv= 20.3 fps
5.9	250	Total			

Summary for Reach 1R: (new Reach)

Inflow = 0.10 cfs @ 12.22 hrs, Volume= 0.003 af
Outflow = 0.06 cfs @ 12.58 hrs, Volume= 0.003 af, Atten= 37%, Lag= 21.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.56 fps, Min. Travel Time= 11.9 min

Avg. Velocity= 0.35 fps, Avg. Travel Time= 19.0 min

Peak Storage= 45 cf @ 12.38 hrs

Average Depth at Peak Storage= 0.02'

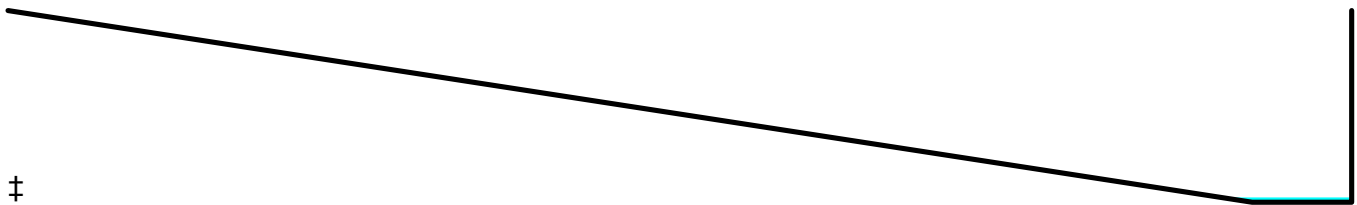
Bank-Full Depth= 1.00' Flow Area= 29.0 sf, Capacity= 134.15 cfs

4.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 0.0 '/' Top Width= 54.00'

Length= 400.0' Slope= 0.0058 '/'

Inlet Invert= 17.17', Outlet Invert= 14.84'



Summary for Pond 5P: POI #1

Inflow Area = 2.590 ac, 16.18% Impervious, Inflow Depth > 0.80" for 10 Year event
 Inflow = 1.71 cfs @ 12.22 hrs, Volume= 0.172 af
 Outflow = 1.71 cfs @ 12.22 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.61 cfs @ 12.22 hrs, Volume= 0.169 af
 Tertiary = 0.10 cfs @ 12.22 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 17.33' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Device 3	17.17'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Tertiary	17.25'	2.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	14.00'	12.0" Round Culvert L= 160.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.00' / 10.70' S= 0.0206 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=1.58 cfs @ 12.22 hrs HW=17.32' (Free Discharge)

↑ **3=Culvert** (Passes 1.58 cfs of 5.02 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 1.58 cfs @ 1.28 fps)

Tertiary OutFlow Max=0.10 cfs @ 12.22 hrs HW=17.32' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.65 fps)

Summary for Pond 6P: POI #2

Inflow Area = 15.868 ac, 15.61% Impervious, Inflow Depth > 0.64" for 10 Year event
 Inflow = 6.82 cfs @ 12.33 hrs, Volume= 0.853 af
 Outflow = 6.82 cfs @ 12.36 hrs, Volume= 0.853 af, Atten= 0%, Lag= 1.4 min
 Primary = 6.82 cfs @ 12.36 hrs, Volume= 0.853 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 15.45' @ 12.36 hrs Surf.Area= 2,382 sf Storage= 439 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.4 min (858.6 - 858.3)

Volume	Invert	Avail.Storage	Storage Description
#1	14.84'	2,089 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.84	4	0	0
14.94	50	3	3
15.04	185	12	14
15.14	450	32	46
15.24	870	66	112
15.34	1,430	115	227
15.44	2,285	186	413
15.54	3,157	272	685
15.64	4,217	369	1,054
15.74	5,118	467	1,521
15.84	6,256	569	2,089

Device	Routing	Invert	Outlet Devices
#1	Device 3	14.84'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	15.24'	178.0 deg x 0.1' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)
#3	Primary	11.50'	10.0" Round Culvert L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.10' S= 0.0091 ' / Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=6.80 cfs @ 12.36 hrs HW=15.45' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.90 cfs @ 1.13 fps)

↑ **3=Culvert** (Inlet Controls 3.90 cfs @ 7.15 fps)

↑ **1=Orifice/Grate** (Passes 3.90 cfs of 12.48 cfs potential flow)

Summary for Pond 7P: POI #3

Inflow Area = 0.396 ac, 6.31% Impervious, Inflow Depth > 1.14" for 10 Year event
Inflow = 0.53 cfs @ 12.10 hrs, Volume= 0.038 af
Primary = 0.53 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Area 1

Runoff = 3.37 cfs @ 12.20 hrs, Volume= 0.303 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.512	69		50-75% Grass cover, Fair, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.171			83.82% Pervious Area
0.419			16.18% Impervious Area
0.142			33.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Summary for Subcatchment 2S: Area 2

Runoff = 14.79 cfs @ 12.29 hrs, Volume= 1.569 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
6.111	43		Woods/grass comb., Fair, HSG A
0.963	98		Paved roads w/curbs & sewers, HSG B
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
2.565	56		Brush, Fair, HSG B
1.015	69		50-75% Grass cover, Fair, HSG B
15.868	57	54	Weighted Average, UI Adjusted
13.391			84.39% Pervious Area
2.477			15.61% Impervious Area
1.514			61.12% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
2.9	150	0.0150	0.86		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
2.1	360	0.0200	2.87		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
17.8	890	Total			

Summary for Subcatchment 3S: Area 3

Runoff = 0.90 cfs @ 12.10 hrs, Volume= 0.062 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.174	65	Woods/grass comb., Fair, HSG B
0.025	98	Paved roads w/curbs & sewers, HSG B
0.171	56	Brush, Fair, HSG B
0.026	69	50-75% Grass cover, Fair, HSG B
0.396	63	Weighted Average
0.371		93.69% Pervious Area
0.025		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.5000	0.24		Sheet Flow, Wooded Embankment
					Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	150	0.0300	1.21		Shallow Concentrated Flow, Across Grass/Brush Field
					Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, west commercial street
					Paved Kv= 20.3 fps
5.9	250	Total			

Summary for Reach 1R: (new Reach)

Inflow = 0.30 cfs @ 12.20 hrs, Volume= 0.009 af
Outflow = 0.23 cfs @ 12.44 hrs, Volume= 0.009 af, Atten= 23%, Lag= 14.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.85 fps, Min. Travel Time= 7.8 min

Avg. Velocity= 0.41 fps, Avg. Travel Time= 16.3 min

Peak Storage= 111 cf @ 12.31 hrs

Average Depth at Peak Storage= 0.05'

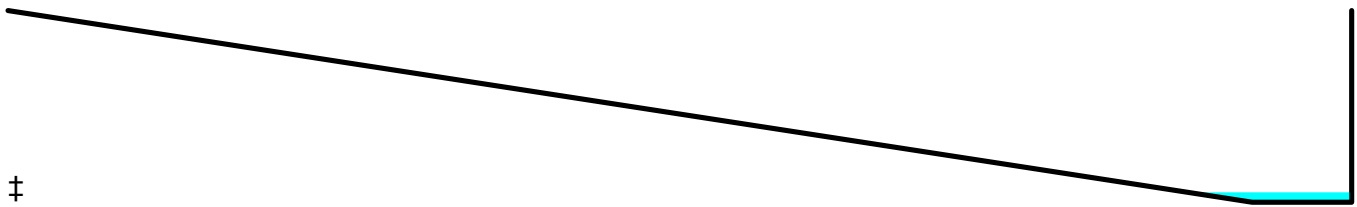
Bank-Full Depth= 1.00' Flow Area= 29.0 sf, Capacity= 134.15 cfs

4.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 0.0 '/' Top Width= 54.00'

Length= 400.0' Slope= 0.0058 '/'

Inlet Invert= 17.17', Outlet Invert= 14.84'



Summary for Pond 5P: POI #1

Inflow Area = 2.590 ac, 16.18% Impervious, Inflow Depth > 1.40" for 25 Year event
 Inflow = 3.37 cfs @ 12.20 hrs, Volume= 0.303 af
 Outflow = 3.37 cfs @ 12.20 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.06 cfs @ 12.20 hrs, Volume= 0.293 af
 Tertiary = 0.30 cfs @ 12.20 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 17.41' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Device 3	17.17'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Tertiary	17.25'	2.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	14.00'	12.0" Round Culvert L= 160.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.00' / 10.70' S= 0.0206 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=3.05 cfs @ 12.20 hrs HW=17.41' (Free Discharge)

↑ **3=Culvert** (Passes 3.05 cfs of 5.09 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 3.05 cfs @ 1.60 fps)

Tertiary OutFlow Max=0.30 cfs @ 12.20 hrs HW=17.41' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 0.94 fps)

Summary for Pond 6P: POI #2

Inflow Area = 15.868 ac, 15.61% Impervious, Inflow Depth > 1.19" for 25 Year event
 Inflow = 14.91 cfs @ 12.29 hrs, Volume= 1.579 af
 Outflow = 14.90 cfs @ 12.31 hrs, Volume= 1.579 af, Atten= 0%, Lag= 0.9 min
 Primary = 14.90 cfs @ 12.31 hrs, Volume= 1.579 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 15.60' @ 12.31 hrs Surf.Area= 3,779 sf Storage= 888 cf

Plug-Flow detention time= 0.5 min calculated for 1.579 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (842.4 - 841.9)

Volume	Invert	Avail.Storage	Storage Description
#1	14.84'	2,089 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.84	4	0	0
14.94	50	3	3
15.04	185	12	14
15.14	450	32	46
15.24	870	66	112
15.34	1,430	115	227
15.44	2,285	186	413
15.54	3,157	272	685
15.64	4,217	369	1,054
15.74	5,118	467	1,521
15.84	6,256	569	2,089

Device	Routing	Invert	Outlet Devices
#1	Device 3	14.84'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	15.24'	178.0 deg x 0.1' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)
#3	Primary	11.50'	10.0" Round Culvert L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.10' S= 0.0091 ' S= 0.0091 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=14.83 cfs @ 12.31 hrs HW=15.60' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 10.85 cfs @ 1.47 fps)

↑ **3=Culvert** (Inlet Controls 3.98 cfs @ 7.29 fps)

↑ **1=Orifice/Grate** (Passes 3.98 cfs of 16.77 cfs potential flow)

Summary for Pond 7P: POI #3

Inflow Area = 0.396 ac, 6.31% Impervious, Inflow Depth > 1.87" for 25 Year event

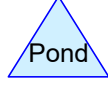
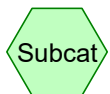
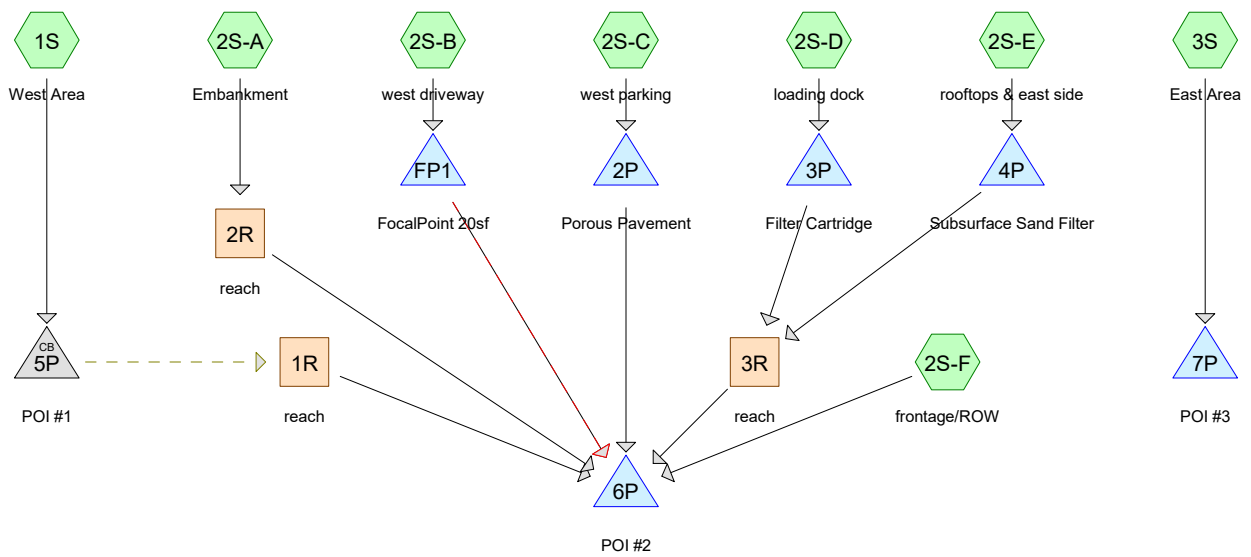
Inflow = 0.90 cfs @ 12.10 hrs, Volume= 0.062 af

Primary = 0.90 cfs @ 12.10 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

ATTACHMENT B

Postdevelopment Runoff Calculations



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.139	49	50-75% Grass cover, Fair, HSG A (1S, 2S-A)
0.483	69	50-75% Grass cover, Fair, HSG B (1S)
0.902	61	>75% Grass cover, Good, HSG B (2S-A, 2S-B, 2S-C, 2S-E, 2S-F, 3S)
1.273	98	Paved parking, HSG B (1S, 2S-B, 2S-D, 2S-E, 2S-F, 3S)
1.387	98	Paved parking, HSG C (2S-C)
0.927	98	Paved roads w/curbs & sewers, HSG B (1S, 2S-F, 3S)
1.608	98	Roofs, HSG B (2S-E)
0.008	98	Unconnected pavement, HSG B (2S-A)
1.656	98	Unconnected roofs, HSG B (1S, 2S-A)
6.429	43	Woods/grass comb., Fair, HSG A (1S, 2S-A)
0.042	65	Woods/grass comb., Fair, HSG B (2S-E, 3S)

Summary for Subcatchment 1S: West Area

Runoff = 0.30 cfs @ 12.41 hrs, Volume= 0.060 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.483	69		50-75% Grass cover, Fair, HSG B
0.029	98		Paved parking, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.142			82.70% Pervious Area
0.448			17.30% Impervious Area
0.142			31.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Summary for Subcatchment 2S-A: Embankment

Runoff = 0.16 cfs @ 13.80 hrs, Volume= 0.095 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Adj	Description
5.209	43		Woods/grass comb., Fair, HSG A
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
0.182	61		>75% Grass cover, Good, HSG B
0.008	98		Unconnected pavement, HSG B
10.613	53	50	Weighted Average, UI Adjusted
9.091			85.66% Pervious Area
1.522			14.34% Impervious Area
1.522			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.4	530	Total			

Summary for Subcatchment 2S-B: west driveway

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
0.018	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.058	72	Weighted Average
0.040		68.97% Pervious Area
0.018		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 2S-C: west parking

Runoff = 4.28 cfs @ 12.07 hrs, Volume= 0.315 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
1.387	98	Paved parking, HSG C
0.159	61	>75% Grass cover, Good, HSG B
1.546	94	Weighted Average
0.159		10.28% Pervious Area
1.387		89.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-D: loading dock

Runoff = 0.10 cfs @ 12.07 hrs, Volume= 0.008 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
0.033	98	Paved parking, HSG B
0.033		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-E: rooftops & east side

Runoff = 7.02 cfs @ 12.07 hrs, Volume= 0.523 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
0.784	98	Roofs, HSG B
0.824	98	Roofs, HSG B
0.664	98	Paved parking, HSG B
0.164	61	>75% Grass cover, Good, HSG B
0.030	65	Woods/grass comb., Fair, HSG B
2.466	95	Weighted Average
0.194		7.87% Pervious Area
2.272		92.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-F: frontage/ROW

Runoff = 2.73 cfs @ 12.17 hrs, Volume= 0.241 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
0.281	98	Paved parking, HSG B
0.130	61	>75% Grass cover, Good, HSG B
0.613	98	Paved roads w/curbs & sewers, HSG B
0.192	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.396	90	Weighted Average
0.310		22.21% Pervious Area
1.086		77.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
4.4	750	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.3	825	Total			

Summary for Subcatchment 3S: East Area

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 0.020 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (ac)	CN	Description
0.039	98	Paved parking, HSG B
0.045	61	>75% Grass cover, Good, HSG B
0.037	98	Paved roads w/curbs & sewers, HSG B
0.012	65	Woods/grass comb., Fair, HSG B
0.017	98	Paved parking, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.152	84	Weighted Average
0.059		38.82% Pervious Area
0.093		61.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: reach

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

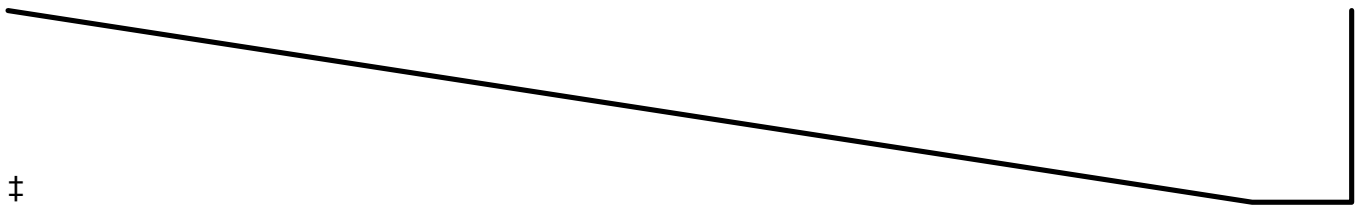
Bank-Full Depth= 1.00' Flow Area= 29.0 sf, Capacity= 134.15 cfs

4.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 0.0 '/' Top Width= 54.00'

Length= 400.0' Slope= 0.0058 '/'

Inlet Invert= 17.17', Outlet Invert= 14.84'



Summary for Reach 2R: reach

Inflow Area = 10.613 ac, 14.34% Impervious, Inflow Depth > 0.11" for 2 Year event
Inflow = 0.16 cfs @ 13.80 hrs, Volume= 0.095 af
Outflow = 0.16 cfs @ 13.91 hrs, Volume= 0.095 af, Atten= 0%, Lag= 6.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.56 fps, Min. Travel Time= 3.9 min

Avg. Velocity = 2.18 fps, Avg. Travel Time= 4.6 min

Peak Storage= 38 cf @ 13.84 hrs

Average Depth at Peak Storage= 0.10'

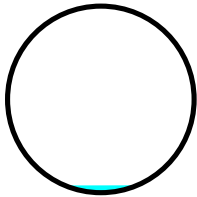
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 57.37 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 600.0' Slope= 0.0167 '/'

Inlet Invert= 22.00', Outlet Invert= 12.00'



Summary for Reach 3R: reach

Inflow Area = 2.499 ac, 92.24% Impervious, Inflow Depth > 1.38" for 2 Year event
Inflow = 3.33 cfs @ 12.16 hrs, Volume= 0.288 af
Outflow = 2.53 cfs @ 12.22 hrs, Volume= 0.287 af, Atten= 24%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.08 fps, Min. Travel Time= 1.3 min

Avg. Velocity= 1.46 fps, Avg. Travel Time= 3.7 min

Peak Storage= 225 cf @ 12.20 hrs

Average Depth at Peak Storage= 0.55'

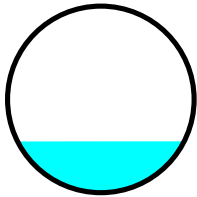
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 17.33 cfs

24.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 320.0' Slope= 0.0050 '/

Inlet Invert= 14.00', Outlet Invert= 12.40'



Summary for Pond 2P: Porous Pavement

Inflow Area = 1.546 ac, 89.72% Impervious, Inflow Depth > 2.45" for 2 Year event
 Inflow = 4.28 cfs @ 12.07 hrs, Volume= 0.315 af
 Outflow = 0.09 cfs @ 17.47 hrs, Volume= 0.119 af, Atten= 98%, Lag= 324.0 min
 Primary = 0.09 cfs @ 17.47 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 20.43' @ 17.47 hrs Surf.Area= 44,844 sf Storage= 9,223 cf

Plug-Flow detention time= 284.0 min calculated for 0.119 af (38% of inflow)
 Center-of-Mass det. time= 153.2 min (940.1 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	18.17'	17,938 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.17	44,844	0.0	0	0
19.92	44,844	0.0	0	0
20.92	44,844	40.0	17,938	17,938
21.50	44,844	0.0	0	17,938

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.17'	2.500 in/hr Exfiltration over Surface area
#2	Primary	18.17'	1.5" Vert. Orifice/Grate C= 0.600
#3	Primary	20.42'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.09 cfs @ 17.47 hrs HW=20.43' (Free Discharge)

2=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.14 fps)
 1=Exfiltration (Passes 0.09 cfs of 2.60 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.41 fps)

Summary for Pond 3P: Filter Cartridge

Inflow Area = 0.033 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2 Year event
Inflow = 0.10 cfs @ 12.07 hrs, Volume= 0.008 af
Primary = 0.10 cfs @ 12.07 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 4P: Subsurface Sand Filter

Inflow Area = 2.466 ac, 92.13% Impervious, Inflow Depth > 2.55" for 2 Year event
 Inflow = 7.02 cfs @ 12.07 hrs, Volume= 0.523 af
 Outflow = 3.27 cfs @ 12.16 hrs, Volume= 0.280 af, Atten= 53%, Lag= 5.4 min
 Primary = 3.27 cfs @ 12.16 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 18.94' @ 12.16 hrs Surf.Area= 0.118 ac Storage= 0.204 af

Plug-Flow detention time= 195.5 min calculated for 0.280 af (53% of inflow)
 Center-of-Mass det. time= 86.2 min (866.9 - 780.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.83'	0.091 af	13.19'W x 386.37'L x 2.94'H Field A 0.344 af Overall - 0.116 af Embedded = 0.228 af x 40.0% Voids
#2A	16.33'	0.111 af	ACF R-Tank HD 1 x 1141 Inside #1 Inside= 15.7"W x 17.3"H => 1.80 sf x 2.35'L = 4.2 cf Outside= 15.7"W x 17.3"H => 1.89 sf x 2.35'L = 4.4 cf 7 Rows of 163 Chambers
#3	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
#4	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
		0.206 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	15.00'	2.500 in/hr Exfiltration over Surface area
#2	Primary	14.00'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 4	18.66'	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
#4	Primary	18.20'	18.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#5	Device 6	18.66'	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
#6	Primary	18.20'	12.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.86 cfs @ 12.16 hrs HW=18.91' (Free Discharge)

2=Orifice/Grate (Orifice Controls 0.08 cfs @ 10.61 fps)
 1=Exfiltration (Passes 0.08 cfs of 0.30 cfs potential flow)
 4=Culvert (Passes 1.39 cfs of 2.34 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Weir Controls 1.39 cfs @ 1.41 fps)
 6=Culvert (Passes 1.39 cfs of 1.70 cfs potential flow)
 5=Broad-Crested Rectangular Weir (Weir Controls 1.39 cfs @ 1.41 fps)

Summary for Pond 5P: POI #1

Inflow Area = 2.590 ac, 17.30% Impervious, Inflow Depth > 0.28" for 2 Year event
 Inflow = 0.30 cfs @ 12.41 hrs, Volume= 0.060 af
 Outflow = 0.30 cfs @ 12.41 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.30 cfs @ 12.41 hrs, Volume= 0.060 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 17.22' @ 12.41 hrs

Device	Routing	Invert	Outlet Devices
#1	Device 3	17.17'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Tertiary	17.25'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	14.00'	12.0" Round Culvert L= 160.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.00' / 10.70' S= 0.0206 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=0.30 cfs @ 12.41 hrs HW=17.22' (Free Discharge)

↑ **3=Culvert** (Passes 0.30 cfs of 4.92 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 0.30 cfs @ 0.74 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' (Free Discharge)

↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: POI #2

Inflow Area = 16.112 ac, 39.21% Impervious, Inflow Depth > 0.56" for 2 Year event
 Inflow = 5.23 cfs @ 12.21 hrs, Volume= 0.746 af
 Outflow = 4.69 cfs @ 12.26 hrs, Volume= 0.747 af, Atten= 10%, Lag= 2.7 min
 Primary = 4.69 cfs @ 12.26 hrs, Volume= 0.747 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 15.37' @ 12.26 hrs Surf.Area= 1,674 sf Storage= 272 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.1 min (882.0 - 882.0)

Volume	Invert	Avail.Storage	Storage Description
#1	14.84'	2,089 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.84	4	0	0
14.94	50	3	3
15.04	185	12	14
15.14	450	32	46
15.24	870	66	112
15.34	1,430	115	227
15.44	2,285	186	413
15.54	3,157	272	685
15.64	4,217	369	1,054
15.74	5,118	467	1,521
15.84	6,256	569	2,089

Device	Routing	Invert	Outlet Devices
#1	Device 3	14.84'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	15.24'	178.0 deg x 0.1' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)
#3	Primary	11.50'	10.0" Round Culvert L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.10' S= 0.0091 ' S= 0.0091 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=4.62 cfs @ 12.26 hrs HW=15.36' (Free Discharge)

2=Sharp-Crested Vee/Trap Weir (Weir Controls 0.77 cfs @ 0.87 fps)

3=Culvert (Inlet Controls 3.85 cfs @ 7.06 fps)

1=Orifice/Grate (Passes 3.85 cfs of 9.91 cfs potential flow)

Summary for Pond 7P: POI #3

Inflow Area = 0.152 ac, 61.18% Impervious, Inflow Depth > 1.60" for 2 Year event
Inflow = 0.29 cfs @ 12.08 hrs, Volume= 0.020 af
Primary = 0.29 cfs @ 12.08 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond FP1: FocalPoint 20sf

Inflow Area = 0.058 ac, 31.03% Impervious, Inflow Depth > 0.87" for 2 Year event
 Inflow = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af
 Outflow = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Atten= 13%, Lag= 0.0 min
 Primary = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 16.84' @ 12.14 hrs Surf.Area= 20 sf Storage= 2 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	16.45'	9 cf	3.00'W x 6.67'L x 2.25'H FocalPoint 45 cf Overall x 20.0% Voids
#2	18.70'	49 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
		58 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.70	32	0	0
19.00	60	14	14
19.50	80	35	49

Device	Routing	Invert	Outlet Devices
#1	Primary	16.45'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#2	Secondary	19.20'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 12.10 hrs HW=16.69' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=16.45' (Free Discharge)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 1S: West Area

Runoff = 1.71 cfs @ 12.22 hrs, Volume= 0.193 af, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.483	69		50-75% Grass cover, Fair, HSG B
0.029	98		Paved parking, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.142			82.70% Pervious Area
0.448			17.30% Impervious Area
0.142			31.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Summary for Subcatchment 2S-A: Embankment

Runoff = 2.76 cfs @ 12.39 hrs, Volume= 0.472 af, Depth> 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Adj	Description
5.209	43		Woods/grass comb., Fair, HSG A
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
0.182	61		>75% Grass cover, Good, HSG B
0.008	98		Unconnected pavement, HSG B
10.613	53	50	Weighted Average, UI Adjusted
9.091			85.66% Pervious Area
1.522			14.34% Impervious Area
1.522			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.4	530	Total			

Summary for Subcatchment 2S-B: west driveway

Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
0.018	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.058	72	Weighted Average
0.040		68.97% Pervious Area
0.018		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 2S-C: west parking

Runoff = 6.67 cfs @ 12.07 hrs, Volume= 0.504 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
1.387	98	Paved parking, HSG C
0.159	61	>75% Grass cover, Good, HSG B
1.546	94	Weighted Average
0.159		10.28% Pervious Area
1.387		89.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-D: loading dock

Runoff = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
0.033	98	Paved parking, HSG B
0.033		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-E: rooftops & east side

Runoff = 10.81 cfs @ 12.07 hrs, Volume= 0.826 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
0.784	98	Roofs, HSG B
0.824	98	Roofs, HSG B
0.664	98	Paved parking, HSG B
0.164	61	>75% Grass cover, Good, HSG B
0.030	65	Woods/grass comb., Fair, HSG B
2.466	95	Weighted Average
0.194		7.87% Pervious Area
2.272		92.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-F: frontage/ROW

Runoff = 4.50 cfs @ 12.17 hrs, Volume= 0.405 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
0.281	98	Paved parking, HSG B
0.130	61	>75% Grass cover, Good, HSG B
0.613	98	Paved roads w/curbs & sewers, HSG B
0.192	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.396	90	Weighted Average
0.310		22.21% Pervious Area
1.086		77.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
4.4	750	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.3	825	Total			

Summary for Subcatchment 3S: East Area

Runoff = 0.52 cfs @ 12.08 hrs, Volume= 0.037 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (ac)	CN	Description
0.039	98	Paved parking, HSG B
0.045	61	>75% Grass cover, Good, HSG B
0.037	98	Paved roads w/curbs & sewers, HSG B
0.012	65	Woods/grass comb., Fair, HSG B
0.017	98	Paved parking, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.152	84	Weighted Average
0.059		38.82% Pervious Area
0.093		61.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: reach

Inflow = 0.13 cfs @ 12.22 hrs, Volume= 0.003 af
Outflow = 0.09 cfs @ 12.55 hrs, Volume= 0.003 af, Atten= 35%, Lag= 20.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.61 fps, Min. Travel Time= 10.8 min

Avg. Velocity= 0.36 fps, Avg. Travel Time= 18.5 min

Peak Storage= 56 cf @ 12.37 hrs

Average Depth at Peak Storage= 0.03'

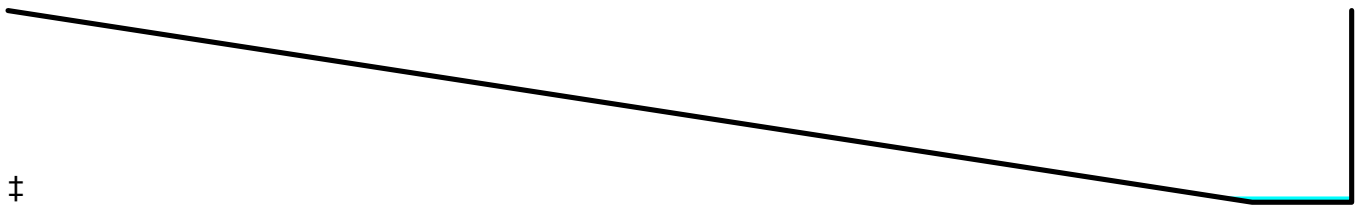
Bank-Full Depth= 1.00' Flow Area= 29.0 sf, Capacity= 134.15 cfs

4.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 0.0 '/' Top Width= 54.00'

Length= 400.0' Slope= 0.0058 '/'

Inlet Invert= 17.17', Outlet Invert= 14.84'



Summary for Reach 2R: reach

Inflow Area = 10.613 ac, 14.34% Impervious, Inflow Depth > 0.53" for 10 Year event
Inflow = 2.76 cfs @ 12.39 hrs, Volume= 0.472 af
Outflow = 2.75 cfs @ 12.44 hrs, Volume= 0.470 af, Atten= 0%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 6.02 fps, Min. Travel Time= 1.7 min

Avg. Velocity = 3.32 fps, Avg. Travel Time= 3.0 min

Peak Storage= 275 cf @ 12.41 hrs

Average Depth at Peak Storage= 0.37'

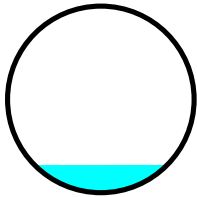
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 57.37 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 600.0' Slope= 0.0167 '/'

Inlet Invert= 22.00', Outlet Invert= 12.00'



Summary for Reach 3R: reach

Inflow Area = 2.499 ac, 92.24% Impervious, Inflow Depth > 2.91" for 10 Year event
Inflow = 10.34 cfs @ 12.07 hrs, Volume= 0.607 af
Outflow = 9.89 cfs @ 12.10 hrs, Volume= 0.606 af, Atten= 4%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 5.74 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.66 fps, Avg. Travel Time= 3.2 min

Peak Storage= 571 cf @ 12.09 hrs

Average Depth at Peak Storage= 1.11'

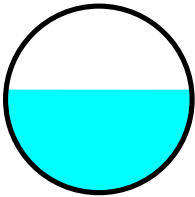
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 17.33 cfs

24.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 320.0' Slope= 0.0050 '/'

Inlet Invert= 14.00', Outlet Invert= 12.40'



Summary for Pond 2P: Porous Pavement

Inflow Area = 1.546 ac, 89.72% Impervious, Inflow Depth > 3.91" for 10 Year event
 Inflow = 6.67 cfs @ 12.07 hrs, Volume= 0.504 af
 Outflow = 0.34 cfs @ 14.13 hrs, Volume= 0.264 af, Atten= 95%, Lag= 123.3 min
 Primary = 0.34 cfs @ 14.13 hrs, Volume= 0.264 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 20.66' @ 14.13 hrs Surf.Area= 44,844 sf Storage= 13,326 cf

Plug-Flow detention time= 280.6 min calculated for 0.264 af (52% of inflow)
 Center-of-Mass det. time= 167.3 min (941.9 - 774.6)

Volume	Invert	Avail.Storage	Storage Description
#1	18.17'	17,938 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.17	44,844	0.0	0	0
19.92	44,844	0.0	0	0
20.92	44,844	40.0	17,938	17,938
21.50	44,844	0.0	0	17,938

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.17'	2.500 in/hr Exfiltration over Surface area
#2	Primary	18.17'	1.5" Vert. Orifice/Grate C= 0.600
#3	Primary	20.42'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.34 cfs @ 14.13 hrs HW=20.66' (Free Discharge)

2=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.51 fps)
 1=Exfiltration (Passes 0.09 cfs of 2.60 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.25 cfs @ 1.68 fps)

Summary for Pond 3P: Filter Cartridge

Inflow Area = 0.033 ac, 100.00% Impervious, Inflow Depth > 4.36" for 10 Year event

Inflow = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af

Primary = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 4P: Subsurface Sand Filter

Inflow Area = 2.466 ac, 92.13% Impervious, Inflow Depth > 4.02" for 10 Year event
 Inflow = 10.81 cfs @ 12.07 hrs, Volume= 0.826 af
 Outflow = 10.19 cfs @ 12.07 hrs, Volume= 0.595 af, Atten= 6%, Lag= 0.2 min
 Primary = 10.19 cfs @ 12.07 hrs, Volume= 0.595 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 19.54' @ 12.07 hrs Surf.Area= 0.118 ac Storage= 0.204 af

Plug-Flow detention time= 141.6 min calculated for 0.594 af (72% of inflow)
 Center-of-Mass det. time= 53.4 min (822.5 - 769.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.83'	0.091 af	13.19'W x 386.37'L x 2.94'H Field A 0.344 af Overall - 0.116 af Embedded = 0.228 af x 40.0% Voids
#2A	16.33'	0.111 af	ACF R-Tank HD 1 x 1141 Inside #1 Inside= 15.7"W x 17.3"H => 1.80 sf x 2.35'L = 4.2 cf Outside= 15.7"W x 17.3"H => 1.89 sf x 2.35'L = 4.4 cf 7 Rows of 163 Chambers
#3	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
#4	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
		0.206 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	15.00'	2.500 in/hr Exfiltration over Surface area
#2	Primary	14.00'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 4	18.66'	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
#4	Primary	18.20'	18.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#5	Device 6	18.66'	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
#6	Primary	18.20'	12.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=9.78 cfs @ 12.07 hrs HW=19.50' (Free Discharge)

- 2=Orifice/Grate (Orifice Controls 0.09 cfs @ 11.24 fps)
- 1=Exfiltration (Passes 0.09 cfs of 0.30 cfs potential flow)
- 4=Culvert (Inlet Controls 6.31 cfs @ 3.88 fps)
- 3=Broad-Crested Rectangular Weir (Passes 6.31 cfs of 10.17 cfs potential flow)
- 6=Culvert (Inlet Controls 3.38 cfs @ 4.31 fps)
- 5=Broad-Crested Rectangular Weir (Passes 3.38 cfs of 10.17 cfs potential flow)

Summary for Pond 5P: POI #1

Inflow Area = 2.590 ac, 17.30% Impervious, Inflow Depth > 0.90" for 10 Year event
 Inflow = 1.71 cfs @ 12.22 hrs, Volume= 0.193 af
 Outflow = 1.71 cfs @ 12.22 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.58 cfs @ 12.22 hrs, Volume= 0.190 af
 Tertiary = 0.13 cfs @ 12.22 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 17.32' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Device 3	17.17'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Tertiary	17.25'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	14.00'	12.0" Round Culvert L= 160.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.00' / 10.70' S= 0.0206 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.22 hrs HW=17.32' (Free Discharge)

↑ **3=Culvert** (Passes 1.55 cfs of 5.02 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 1.55 cfs @ 1.28 fps)

Tertiary OutFlow Max=0.13 cfs @ 12.22 hrs HW=17.32' (Free Discharge)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.13 cfs @ 0.88 fps)

Summary for Pond 6P: POI #2

Inflow Area = 16.112 ac, 39.21% Impervious, Inflow Depth > 1.31" for 10 Year event
 Inflow = 14.19 cfs @ 12.12 hrs, Volume= 1.758 af
 Outflow = 13.74 cfs @ 12.14 hrs, Volume= 1.758 af, Atten= 3%, Lag= 1.2 min
 Primary = 13.74 cfs @ 12.14 hrs, Volume= 1.758 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 15.58' @ 12.14 hrs Surf.Area= 3,613 sf Storage= 831 cf

Plug-Flow detention time= 0.5 min calculated for 1.758 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (865.9 - 865.4)

Volume	Invert	Avail.Storage	Storage Description
#1	14.84'	2,089 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.84	4	0	0
14.94	50	3	3
15.04	185	12	14
15.14	450	32	46
15.24	870	66	112
15.34	1,430	115	227
15.44	2,285	186	413
15.54	3,157	272	685
15.64	4,217	369	1,054
15.74	5,118	467	1,521
15.84	6,256	569	2,089

Device	Routing	Invert	Outlet Devices
#1	Device 3	14.84'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	15.24'	178.0 deg x 0.1' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)
#3	Primary	11.50'	10.0" Round Culvert L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.10' S= 0.0091 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=13.58 cfs @ 12.14 hrs HW=15.58' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 9.61 cfs @ 1.44 fps)

↑ **3=Culvert** (Inlet Controls 3.97 cfs @ 7.28 fps)

↑ **1=Orifice/Grate** (Passes 3.97 cfs of 16.58 cfs potential flow)

Summary for Pond 7P: POI #3

Inflow Area = 0.152 ac, 61.18% Impervious, Inflow Depth > 2.90" for 10 Year event

Inflow = 0.52 cfs @ 12.08 hrs, Volume= 0.037 af

Primary = 0.52 cfs @ 12.08 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond FP1: FocalPoint 20sf

Inflow Area = 0.058 ac, 31.03% Impervious, Inflow Depth > 1.89" for 10 Year event
 Inflow = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af
 Outflow = 0.09 cfs @ 12.21 hrs, Volume= 0.009 af, Atten= 31%, Lag= 6.9 min
 Primary = 0.05 cfs @ 12.00 hrs, Volume= 0.009 af
 Secondary = 0.04 cfs @ 12.21 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 19.22' @ 12.21 hrs Surf.Area= 20 sf Storage= 37 cf

Plug-Flow detention time= 4.7 min calculated for 0.009 af (100% of inflow)

Center-of-Mass det. time= 3.7 min (850.0 - 846.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.45'	9 cf	3.00'W x 6.67'L x 2.25'H FocalPoint 45 cf Overall x 20.0% Voids
#2	18.70'	49 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
		58 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.70	32	0	0
19.00	60	14	14
19.50	80	35	49

Device	Routing	Invert	Outlet Devices
#1	Primary	16.45'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#2	Secondary	19.20'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 12.00 hrs HW=17.10' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=0.03 cfs @ 12.21 hrs HW=19.22' (Free Discharge)

↑ **2=Orifice/Grate** (Weir Controls 0.03 cfs @ 0.47 fps)

Summary for Subcatchment 1S: West Area

Runoff = 3.37 cfs @ 12.20 hrs, Volume= 0.335 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
1.220	43		Woods/grass comb., Fair, HSG A
0.277	98		Paved roads w/curbs & sewers, HSG B
0.439	49		50-75% Grass cover, Fair, HSG A
0.142	98		Unconnected roofs, HSG B
0.483	69		50-75% Grass cover, Fair, HSG B
0.029	98		Paved parking, HSG B
2.590	58	57	Weighted Average, UI Adjusted
2.142			82.70% Pervious Area
0.448			17.30% Impervious Area
0.142			31.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	120	0.0300	0.20		Sheet Flow, Lawn Area Grass: Short n= 0.150 P2= 3.10"
0.5	110	0.5000	3.54		Shallow Concentrated Flow, Wooded Embankment Woodland Kv= 5.0 fps
1.7	70	0.0100	0.70		Shallow Concentrated Flow, Across Grass/Brush Field Short Grass Pasture Kv= 7.0 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, west commercial street Paved Kv= 20.3 fps
12.9	440	Total			

Summary for Subcatchment 2S-A: Embankment

Runoff = 7.16 cfs @ 12.29 hrs, Volume= 0.921 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Adj	Description
5.209	43		Woods/grass comb., Fair, HSG A
3.700	49		50-75% Grass cover, Fair, HSG A
1.514	98		Unconnected roofs, HSG B
0.182	61		>75% Grass cover, Good, HSG B
0.008	98		Unconnected pavement, HSG B
10.613	53	50	Weighted Average, UI Adjusted
9.091			85.66% Pervious Area
1.522			14.34% Impervious Area
1.522			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	150	0.0300	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
1.1	230	0.5000	3.54		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.4	530	Total			

Summary for Subcatchment 2S-B: west driveway

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.018	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.058	72	Weighted Average
0.040		68.97% Pervious Area
0.018		31.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 2S-C: west parking

Runoff = 8.56 cfs @ 12.07 hrs, Volume= 0.657 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
1.387	98	Paved parking, HSG C
0.159	61	>75% Grass cover, Good, HSG B
1.546	94	Weighted Average
0.159		10.28% Pervious Area
1.387		89.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-D: loading dock

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.033	98	Paved parking, HSG B
0.033		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-E: rooftops & east side

Runoff = 13.80 cfs @ 12.07 hrs, Volume= 1.071 af, Depth> 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.784	98	Roofs, HSG B
0.824	98	Roofs, HSG B
0.664	98	Paved parking, HSG B
0.164	61	>75% Grass cover, Good, HSG B
0.030	65	Woods/grass comb., Fair, HSG B
2.466	95	Weighted Average
0.194		7.87% Pervious Area
2.272		92.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S-F: frontage/ROW

Runoff = 5.91 cfs @ 12.17 hrs, Volume= 0.540 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.281	98	Paved parking, HSG B
0.130	61	>75% Grass cover, Good, HSG B
0.613	98	Paved roads w/curbs & sewers, HSG B
0.192	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.396	90	Weighted Average
0.310		22.21% Pervious Area
1.086		77.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.10"
4.4	750	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.3	825	Total			

Summary for Subcatchment 3S: East Area

Runoff = 0.71 cfs @ 12.07 hrs, Volume= 0.051 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.80"

Area (ac)	CN	Description
0.039	98	Paved parking, HSG B
0.045	61	>75% Grass cover, Good, HSG B
0.037	98	Paved roads w/curbs & sewers, HSG B
0.012	65	Woods/grass comb., Fair, HSG B
0.017	98	Paved parking, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.152	84	Weighted Average
0.059		38.82% Pervious Area
0.093		61.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: reach

Inflow = 0.39 cfs @ 12.20 hrs, Volume= 0.012 af
Outflow = 0.31 cfs @ 12.42 hrs, Volume= 0.012 af, Atten= 20%, Lag= 13.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.93 fps, Min. Travel Time= 7.2 min

Avg. Velocity= 0.43 fps, Avg. Travel Time= 15.7 min

Peak Storage= 135 cf @ 12.30 hrs

Average Depth at Peak Storage= 0.06'

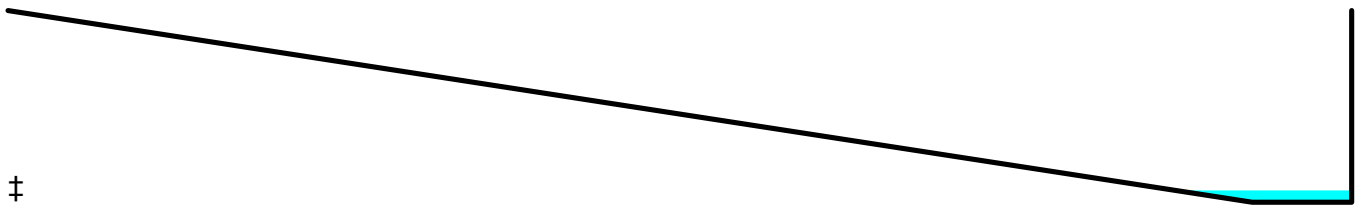
Bank-Full Depth= 1.00' Flow Area= 29.0 sf, Capacity= 134.15 cfs

4.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 0.0 '/' Top Width= 54.00'

Length= 400.0' Slope= 0.0058 '/'

Inlet Invert= 17.17', Outlet Invert= 14.84'



Summary for Reach 2R: reach

Inflow Area = 10.613 ac, 14.34% Impervious, Inflow Depth > 1.04" for 25 Year event
Inflow = 7.16 cfs @ 12.29 hrs, Volume= 0.921 af
Outflow = 7.08 cfs @ 12.33 hrs, Volume= 0.919 af, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 7.97 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 3.92 fps, Avg. Travel Time= 2.5 min

Peak Storage= 539 cf @ 12.31 hrs

Average Depth at Peak Storage= 0.60'

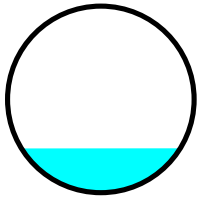
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 57.37 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 600.0' Slope= 0.0167 '/'

Inlet Invert= 22.00', Outlet Invert= 12.00'



Summary for Reach 3R: reach

Inflow Area = 2.499 ac, 92.24% Impervious, Inflow Depth > 4.18" for 25 Year event
Inflow = 13.83 cfs @ 12.07 hrs, Volume= 0.871 af
Outflow = 13.27 cfs @ 12.10 hrs, Volume= 0.870 af, Atten= 4%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Max. Velocity= 6.10 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.80 fps, Avg. Travel Time= 3.0 min

Peak Storage= 717 cf @ 12.09 hrs

Average Depth at Peak Storage= 1.34'

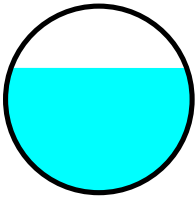
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 17.33 cfs

24.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 320.0' Slope= 0.0050 '/'

Inlet Invert= 14.00', Outlet Invert= 12.40'



Summary for Pond 2P: Porous Pavement

Inflow Area = 1.546 ac, 89.72% Impervious, Inflow Depth > 5.10" for 25 Year event
 Inflow = 8.56 cfs @ 12.07 hrs, Volume= 0.657 af
 Outflow = 0.74 cfs @ 12.97 hrs, Volume= 0.406 af, Atten= 91%, Lag= 53.7 min
 Primary = 0.74 cfs @ 12.97 hrs, Volume= 0.406 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 20.82' @ 12.97 hrs Surf.Area= 44,844 sf Storage= 16,221 cf

Plug-Flow detention time= 253.3 min calculated for 0.405 af (62% of inflow)
 Center-of-Mass det. time= 151.7 min (919.9 - 768.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	18.17'	17,938 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.17	44,844	0.0	0	0
19.92	44,844	0.0	0	0
20.92	44,844	40.0	17,938	17,938
21.50	44,844	0.0	0	17,938

Device	Routing	Invert	Outlet Devices	
#1	Device 2	18.17'	2.500 in/hr Exfiltration over Surface area	
#2	Primary	18.17'	1.5" Vert. Orifice/Grate	C= 0.600
#3	Primary	20.42'	12.0" Vert. Orifice/Grate	C= 0.600

Primary OutFlow Max=0.74 cfs @ 12.97 hrs HW=20.82' (Free Discharge)

2=Orifice/Grate (Orifice Controls 0.10 cfs @ 7.75 fps)
 1=Exfiltration (Passes 0.10 cfs of 2.60 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.64 cfs @ 2.16 fps)

Summary for Pond 3P: Filter Cartridge

Inflow Area = 0.033 ac, 100.00% Impervious, Inflow Depth > 5.56" for 25 Year event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af
Primary = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 4P: Subsurface Sand Filter

Inflow Area = 2.466 ac, 92.13% Impervious, Inflow Depth > 5.21" for 25 Year event
 Inflow = 13.80 cfs @ 12.07 hrs, Volume= 1.071 af
 Outflow = 13.64 cfs @ 12.07 hrs, Volume= 0.856 af, Atten= 1%, Lag= 0.0 min
 Primary = 13.64 cfs @ 12.07 hrs, Volume= 0.856 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 20.11' @ 12.07 hrs Surf.Area= 0.118 ac Storage= 0.205 af

Plug-Flow detention time= 122.0 min calculated for 0.856 af (80% of inflow)
 Center-of-Mass det. time= 46.3 min (809.5 - 763.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.83'	0.091 af	13.19'W x 386.37'L x 2.94'H Field A 0.344 af Overall - 0.116 af Embedded = 0.228 af x 40.0% Voids
#2A	16.33'	0.111 af	ACF R-Tank HD 1 x 1141 Inside #1 Inside= 15.7"W x 17.3"H => 1.80 sf x 2.35'L = 4.2 cf Outside= 15.7"W x 17.3"H => 1.89 sf x 2.35'L = 4.4 cf 7 Rows of 163 Chambers
#3	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
#4	15.00'	0.002 af	4.00'D x 6.70'H Vertical Cone/Cylinder
		0.206 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	15.00'	2.500 in/hr Exfiltration over Surface area
#2	Primary	14.00'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 4	18.66'	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
#4	Primary	18.20'	18.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#5	Device 6	18.66'	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
#6	Primary	18.20'	12.0" Round Culvert L= 200.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.20' / 16.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=13.14 cfs @ 12.07 hrs HW=20.03' (Free Discharge)

- 2=Orifice/Grate (Orifice Controls 0.09 cfs @ 11.78 fps)
- 1=Exfiltration (Passes 0.09 cfs of 0.30 cfs potential flow)
- 4=Culvert (Inlet Controls 8.86 cfs @ 5.01 fps)
- 3=Broad-Crested Rectangular Weir (Passes 8.86 cfs of 21.37 cfs potential flow)
- 6=Culvert (Barrel Controls 4.19 cfs @ 5.34 fps)
- 5=Broad-Crested Rectangular Weir (Passes 4.19 cfs of 21.37 cfs potential flow)

Summary for Pond 5P: POI #1

Inflow Area = 2.590 ac, 17.30% Impervious, Inflow Depth > 1.55" for 25 Year event
 Inflow = 3.37 cfs @ 12.20 hrs, Volume= 0.335 af
 Outflow = 3.37 cfs @ 12.20 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.97 cfs @ 12.20 hrs, Volume= 0.322 af
 Tertiary = 0.39 cfs @ 12.20 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 17.40' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Device 3	17.17'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Tertiary	17.25'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	14.00'	12.0" Round Culvert L= 160.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 14.00' / 10.70' S= 0.0206 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=2.96 cfs @ 12.20 hrs HW=17.40' (Free Discharge)

↑ **3=Culvert** (Passes 2.96 cfs of 5.09 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 2.96 cfs @ 1.58 fps)

Tertiary OutFlow Max=0.39 cfs @ 12.20 hrs HW=17.40' (Free Discharge)

↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.39 cfs @ 1.28 fps)

Summary for Pond 6P: POI #2

Inflow Area = 16.112 ac, 39.21% Impervious, Inflow Depth > 2.06" for 25 Year event
 Inflow = 21.12 cfs @ 12.14 hrs, Volume= 2.761 af
 Outflow = 20.95 cfs @ 12.16 hrs, Volume= 2.761 af, Atten= 1%, Lag= 1.0 min
 Primary = 20.95 cfs @ 12.16 hrs, Volume= 2.761 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 15.67' @ 12.16 hrs Surf.Area= 4,466 sf Storage= 1,173 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.5 min (855.1 - 854.6)

Volume	Invert	Avail.Storage	Storage Description
#1	14.84'	2,089 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.84	4	0	0
14.94	50	3	3
15.04	185	12	14
15.14	450	32	46
15.24	870	66	112
15.34	1,430	115	227
15.44	2,285	186	413
15.54	3,157	272	685
15.64	4,217	369	1,054
15.74	5,118	467	1,521
15.84	6,256	569	2,089

Device	Routing	Invert	Outlet Devices
#1	Device 3	14.84'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	15.24'	178.0 deg x 0.1' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)
#3	Primary	11.50'	10.0" Round Culvert L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.10' S= 0.0091 ' S= 0.0091 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=20.81 cfs @ 12.16 hrs HW=15.67' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 16.80 cfs @ 1.61 fps)

↑ **3=Culvert** (Inlet Controls 4.01 cfs @ 7.36 fps)

↑ **1=Orifice/Grate** (Passes 4.01 cfs of 17.51 cfs potential flow)

Summary for Pond 7P: POI #3

Inflow Area = 0.152 ac, 61.18% Impervious, Inflow Depth > 4.01" for 25 Year event
Inflow = 0.71 cfs @ 12.07 hrs, Volume= 0.051 af
Primary = 0.71 cfs @ 12.07 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond FP1: FocalPoint 20sf

Inflow Area = 0.058 ac, 31.03% Impervious, Inflow Depth > 2.83" for 25 Year event
 Inflow = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af, Atten= 0%, Lag= 1.4 min
 Primary = 0.05 cfs @ 11.85 hrs, Volume= 0.012 af
 Secondary = 0.15 cfs @ 12.12 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 19.26' @ 12.10 hrs Surf.Area= 20 sf Storage= 39 cf

Plug-Flow detention time= 5.2 min calculated for 0.014 af (100% of inflow)

Center-of-Mass det. time= 3.5 min (838.1 - 834.6)

Volume	Invert	Avail.Storage	Storage Description
#1	16.45'	9 cf	3.00'W x 6.67'L x 2.25'H FocalPoint 45 cf Overall x 20.0% Voids
#2	18.70'	49 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
		58 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.70	32	0	0
19.00	60	14	14
19.50	80	35	49

Device	Routing	Invert	Outlet Devices
#1	Primary	16.45'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#2	Secondary	19.20'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 11.85 hrs HW=16.64' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=0.13 cfs @ 12.12 hrs HW=19.25' (Free Discharge)

↑ **2=Orifice/Grate** (Weir Controls 0.13 cfs @ 0.76 fps)

ATTACHMENT C

Water Quality Calculations

VA Clinic - Stormwater Management Summary					
01.10.20 Designed By: KAB Checked By: SRB					
Subarea ID	New Development			Treated New Impervious Area (sf)	Treated New Landscaped Area (sf)
	Impervious Area (sf)	Landscaped Area (sf)	Total Developed Area (sf)		
1S	0	0	0	0	0
2S-A	331	7,960	8,291	0	0
2S-B	766	1,740	2,506	766	1,740
2S-C	60,422	6,925	67,347	60,422	6,925
2S-D	1,445	0	1,445	1,445	0
2S-E	98,962	7,143	106,105	98,962	7,143
2S-F*	8,364	7,849	16,213	0	0
3S	1,705	1,962	3,667	0	0
Total (sf)	171,995	25,730	205,574	161,595	15,808
Total (ac)	3.95	0.59	4.72	3.71	0.36

Treatment Summary					
Subarea ID	Treatment Method	Water Quality Volume Required (cf)	Water Quality Volume Provided (cf)	BMP Surface Area Required (sf)	BMP Surface Area Provided (sf)
1S	N/A	0	0	0	0
2S-A	N/A	0	0	0	0
2S-B	FocalPoint (3'x6.67')	N/A	N/A	N/A	N/A
2S-C	Porous Pavement	5,266	12,314	13,469	37,728
2S-D	Filter Cartridge Insert	N/A	N/A	N/A	N/A
2S-E	Subsurface Sand Filter	8,485	8,788	5,091	5,096
2S-F	N/A	0	0	0	0
3S	N/A	0	0	0	0

Treatment Summary		
	Required	Provided
Treated New Impervious (%)	95%	93.95%
Treated New Developed (%)	80%	86.30%

Rational Method Stormwater Conveyance Sizing Computation

25-Year Storm Event

01.07.2020

Designed By: KAB

Checked By: SRB

Structure ID	Outlet Pipe ID	Tributary Impervious Area (sf)	Tributary Pervious Area (sf)	Total Area, A (ac)	Weighted C	25 Year Flow, Q (cfs)	Total Flow to Outlet (cfs)	Outlet Pipe Diameter (in)	Slope (ft/ft)	Flow Velocity (ft/s)	Maximum Flowing Full Capacity (cfs)
DMH1	SD1	0	0	0.00	0.00	0.00	32.29	30	0.0067	7.43	36.47
DMH2	SD2	0	0	0.00	0.00	0.00	22.79	30	0.005	6.42	31.51
DMH3	SD3	0	0	0.00	0.00	0.00	17.89	30	0.005	6.42	31.51
CB1	SD4	500	20,500	0.48	0.22	0.61	17.71	30	0.005	6.42	31.51
CB2	SD5	4,000	78,800	1.90	0.24	2.60	17.10	24	0.0067	6.40	20.11
DMH6	SD6	0	0	0.00	0.00	0.00	14.50	24	0.01	7.82	24.57
CB3	SD7	3,000	52,200	1.27	0.24	1.77	14.50	24	0.01	7.82	24.57
CB4	SD8	30,000	78,000	2.48	0.41	5.87	12.16	24	0.01	7.82	24.57
OCS2	SD9	0	0	0.00	0.00	0.00	6.29	18	0.01	6.46	11.41
CB5	SD10	39,455	925	0.93	0.93	5.02	6.29	18	0.01	6.46	11.41
DMH5	SD11	0	0	0.00	0.00	0.00	0.71	12	0.005	3.48	2.74
CB6	SD12	3,925	3,500	0.17	0.60	0.59	0.71	12	0.005	3.48	2.74
CB7	SD13	980	0	0.02	0.95	0.12	0.12	12	0.01	4.93	3.87
DMH6	SD14	34,350	3,590	0.87	0.88	4.44	6.92	18	0.01	6.46	11.41
CB9	SD15	6,000	39,000	1.03	0.30	1.80	1.80	12	0.02	6.97	5.47
CB11	SD17	6,000	47,250	1.22	0.28	2.02	2.02	12	0.03	8.53	6.70
CB8	SD18	0	25,500	0.59	0.20	0.68	0.68	12	0.01	4.93	3.87
DMH7	SD19	20,200	1,100	0.49	0.91	2.58	2.58	12	0.02	6.97	5.47
CB12	SD20	6,000	54,500	1.39	0.27	2.21	4.90	15	0.01	5.72	7.02
OCS1	SD21	0	0	0.00	0.00	0.00	2.88	12	0.05	11.02	8.65
DMH8	SD22	0	0	0.00	0.00	0.00	2.88	12	0.01	4.93	3.87
DMH9	SD23	0	0	0.00	0.00	0.00	1.44	10	0.01	4.36	2.38
BLDG	SD24	11,385	0	0.26	0.95	1.44	1.44	8	0.0208	5.42	1.89
CB13	SD25	1,445	0	0.03	0.95	0.18	0.18	8	0.01	3.76	1.31
DMH10	SD26	0	0	0.00	0.00	0.00	3.66	12	0.05	11.02	8.65
CB15	SD27	6,150	2,350	0.20	0.74	0.84	1.06	12	0.01	4.93	3.87
CB16	SD28	1,600	587	0.05	0.75	0.22	0.22	12	0.01	4.93	3.87
CB17	SD29	9,215	0	0.21	0.95	1.17	2.61	12	0.01	4.93	3.87
BLDG	SD30	11,385	0	0.26	0.95	1.44	1.44	8	0.0208	5.42	1.89
OCS2	SD31	0	0	0.00	0.00	0.00	6.29	12	0.01	4.93	3.87
CB14	SD32	4,282	820	0.12	0.83	0.56	0.56	12	0.01	4.93	3.87
BLDG	SD33	11,385	0	0.26	0.95	1.44	1.44	8	0.0208	5.42	1.89
OCS1	SD34	0	0	0.00	0.00	0.00	2.88	12	0.01	4.93	3.87

VA Clinic - Drawdown Calcs

01.17.2020

Designed By:
KAB

Checked By: SRB

Drawdown Calculation - Subsurface Sand Filter

Orifice Diameter =1.25 in

Elev. (ft)	Depth (ft)	Surface Area (sq.ft)	Ave. End Area (sq.ft)	End Area Depth (ft)	Incremental Volume (cf)	Head, h (ft)	Orifice Flow (cfs)	Drawdown Time (secs)	Drawdown Time (hours)
18.66	2.83	5,096	5096.00	2.83	8787.50	3.83	0.0803	109471.17	30.409
15.83	0.00	5,096	0.00	0.00	0.00	2.33	0.0626	0.00	0.000
								TOTAL	30.409

Orifice Formula $CA (2gh)^{1/2}$
Orifice Diameter: 1.25 inch
A: 0.008522 sq.ft
Filter Thickness: 2.33 feet
g: 32.174 ft/s²
C: 0.6 Orifice/Grate

01.07.2020 VA Clinic Pretreatment Calcs Designed By: KAB Checked By: SRB	
Subsurface Sand Filter	
Total Impervious Area (sf)	60422
Total Landscape Area (sf)	6,925
Total Developed Area (ac)	1.55
1-yr 24-hr Storm Event Peak Flow (cfs)	3.52
Pretreatment R-Tank Modules Required	177

1-yr 24-hr rain	2.61"
C (impervious)	0.95
C (pervious)	0.2

ATTACHMENT D

FocalPoint® Design Worksheet/Checklist

FOCALPOINT

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM

US DEPT OF VETS AFFAIRS – COMMUNITY OUTPATIENT – PORTLAND, MAINE

MAINE – CHAPTER 500 DESIGN WORKSHEET/CHECKLIST

1. FocalPoint Bed Area (min 174 square feet per acre of impervious area (e.g. 0.2 acres = 35 sf))

- Tributary Impervious area = 0.030 ac. (A)
- Tributary Pervious area = 0.103 ac. (B)
- Min FocalPoint bed area req'd = $(((A) \times 1.0) + ((B) \times 0.4)) \times 174$ = 12.4 sf.
- FocalPoint Bed Area provided * = 20 sf.
- Dimensions of Proposed FocalPoint = 3 ft x 6.67 ft

* see criteria 2. to determine if minimum size is appropriate.

2. A 0.95 inch Type III 24hr rainfall event shall be modelled to demonstrate the entire storm volume is treated prior to activation of the overflow (typically set at 6-12" above the mulch)

- Temporary storage depth provided = 6 inches (typ 6" to 12")
- Temporary storage volume provided at above depth = 25 cubic feet.
- Peak ponding depth from 0.95" 24hr storm event = 0 inches

3. Ratio of the surface area of the filter media (sf) to the temporary ponding volume (cf) shall be no less than 1:5

- Ratio of FocalPoint Bed Area : Temporary Storage Vol = 1 : 1.25

4. Subsurface R-Tank or Chamber Treatment Row must be sized to treat the peak flow from a 1 yr-24hr storm event.

- 1yr 24hr Peak Flowrate = 0.05 cfs
- Chamber model selected
 - o Cultec 330 XLHD (1 chamber per 0.227 cfs) ☐
 - o Cultec 150XLHD (1 chamber per 0.185 cfs) ☐
 - o R-Tank modules (1 module per 0.02 cfs) ☒
- Number of Chambers/modules required = 3

5. Controlled release of the Channel Protection over 24-48 hrs

- Controlled release of the channel protection volume is being achieved by:
 - o Expanded subsurface storage basin with OCS ☐
 - o Surface detention basin with OCS ☐

6. A landscape plan for the FocalPoint bed area has been prepared ☐

7. The Design shall be reviewed by the manufacturer's representative prior to submission and installation will be overseen by the manufacturer's representative.

- The Design has been reviewed by ACF Environmental ☐
- Engineer will coordinate installation inspection with ACF ☐

ATTACHMENT E

**Geotechnical Report
Prepared by Summit GeoEngineering**

From: [Bill Peterlein](#)
To: [Griffin Hornyak](#); [Michael Cartoski](#); [Claiborne Williams](#); [greg.heppner@smithgroup.com](#); [christine.rancourt@smithgroup.com](#); [Reaz Haque](#); [Kevin French](#); [Mason Rowell](#); [Michael Parma](#); [Jeff Griffin](#); [Steve Bushey](#); [Ben Dineen](#); [Vin Veroneau](#); [Rich Burke](#); [Celina Daniell](#); [bob.vallee@jbbrown.com](#); [kane@jbbrown.com](#); [Adriane Cody](#); [michael.coppola@smithgroup.com](#); [paul.taylor@smithgroup.com](#); [denge.agola@smithgroup.com](#); [syoung@ljbinc.com](#); [AJ Hodge](#); [Sasha Velic](#); [Ethan Grossman](#); [jlutz@ljbinc.com](#); [Timothy LeGage](#)
Subject: RE: VA Portland - Weekly Team Meeting
Date: Monday, October 28, 2019 1:53:16 PM

Based on the subsurface conditions encountered at the parking garage area and my analyses I will be recommending the following for the proposed garage in my supplemental geotechnical report. Note that these recommendations are similar to the recommendations I forwarded on October 7, 2019.

Foundation Type: Conventional spread footing foundations.

Allowable Bearing Pressure = 3,000 psf. Maximum settlement 1.1 inch. Settlement range 0.4 to 1.1 inches. Total and differential settlements acceptable for steel framed structure.

Required frost protection depth = 4 ft

Subgrade preparation for interior and exterior isolated column footings

1. Excavate the building footprint to 12 inches below the base of the proposed slab.
2. Proofroll entire building footprint using a vibrator compactor having a minimum weight of 10 tons and making a minimum of 4 passes in each of two perpendicular directions. This is intended to densify the existing fill soil.
3. Excavate to 12 inches below the base of the footings. Proofroll the exposed subgrade by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
4. Install a layer of woven geotextile such as Mirafi RS280i on the proof-rolled subgrade soil. Extend the geotextile at least 2 feet beyond the edge of the footing all around.
5. Place a minimum of 12 inches of $\frac{3}{4}$ inch crushed stone directly on the geotextile. Compact the stone with a vibratory plate compactor.
6. Construct the footing directly on the compacted crushed stone. For exterior column footings the crushed stone can be included in the frost protection depth if desired, reducing the minimum depth from the bottom of the footing to the exterior finished grade to 3 feet.

Subgrade preparation for perimeter footings (assume 2 kips/ft linear load):

1. Excavate to the base of the footing (minimum 4 feet frost protection depth).
2. Proofroll the exposed soil by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
3. Construct the footings directly on the proofrolled soil. The use of crushed stone and geotextile is optional.

Other recommendations:

- Perimeter underdrains are not necessary.
- Seismic Site Class D (based on limited SW Cole soil boring data – no borings were carried to refusal so the depth of bedrock is unknown).
- Slab constructed on a minimum of 12 inches of ¾ inch crushed stone placed directly on the proofrolled subgrade soil (no geotextile necessary).
- Base friction coefficient between CIP concrete and crushed stone = 0.60
- Based friction coefficient between CIP concrete and existing soil = 0.40

Hopefully the above info will keep the project moving forward until I can prepare the supplemental report.

Please contact me with any questions or if any additional information is needed.

Bill

Bill Peterlein, P.E.
 President & Principal Engineer
Summit Geoengineering Services
 145 Lisbon Street, Suite 701
 P.O. Box 7216
 Lewiston, ME 04243
 (207) 576-3313

<http://www.summitgeoeng.com/>

From: Griffin Hornyak <ghornyak@fdstonewater.com>

Sent: Wednesday, October 23, 2019 3:33 PM

To: Michael Cartoski <mcartoski@fdstonewater.com>; Claiborne Williams <cwilliams@fdstonewater.com>; greg.heppner@smithgroup.com; christine.rancourt@smithgroup.com; Reaz Haque <Reaz.Haque@smithgroup.com>; Kevin French <kfrench@landryfrenchconstruction.com>; Mason Rowell <mrowell@landryfrenchconstruction.com>; Michael Parma <Michael.Parma@smithgroup.com>; Jeff Griffin <jgriffin@ljbinc.com>; sbushey@gorrillpalmer.com; Ben Dineen <bdineen@fdstonewater.com>; Vin Veroneau <veroneau@jbbrown.com>; Rich Burke <rburke@landryfrenchconstruction.com>; Celina Daniell <cdaniell@gorrillpalmer.com>; bob.vallee@jbbrown.com; kane@jbbrown.com; Adriane Cody <adriane.cody@smithgroup.com>; michael.coppola@smithgroup.com; paul.taylor@smithgroup.com; denge.agola@smithgroup.com; syoung@ljbinc.com; AJ Hodge <AJ.Hodge@smithgroup.com>; Sasha Velic <Sasha.Velic@smithgroup.com>; Ethan Grossman <Ethan.Grossman@smithgroup.com>; jlutz@ljbinc.com; Bill Peterlein <bpeterlein@summitgeoeng.com>; Timothy LeGage <timothy.legage@smithgroup.com>

Subject: RE: VA Portland - Weekly Team Meeting

Please see attached agenda for our weekly meeting tomorrow afternoon.

Thanks,

Griffin Hornyak

FD STONEWATER

T 703.537.7638 | C 330.461.6002 | ghornyak@fdstonewater.com

-----Original Appointment-----

From: Michael Cartoski <mcartoski@fdstonewater.com>

Sent: Thursday, August 29, 2019 4:51 PM

To: Michael Cartoski; Claiborne Williams; greg.heppner@smithgroup.com; christine.rancourt@smithgroup.com; Reaz Haque; Kevin French; Mason Rowell; Michael Parma; Jeff Griffin; sbushey@gorrillpalmer.com; Ben Dineen; Vin Veroneau; Griffin Hornyak; Rich Burke; Celina Daniell; bob.vallee@jbbrown.com; kane@jbbrown.com; Adriane Cody; michael.coppola@smithgroup.com; paul.taylor@smithgroup.com; denge.agola@smithgroup.com; syoung@ljbinc.com; AJ Hodge; Sasha Velic; Ethan Grossman; jlutz@ljbinc.com; Bill Peterlein; Timothy LeGage

Subject: VA Portland - Weekly Team Meeting

When: Occurs every Thursday effective 9/5/2019 until 1/17/2020 from 2:00 PM to 3:00 PM (UTC-05:00) Eastern Time (US & Canada).

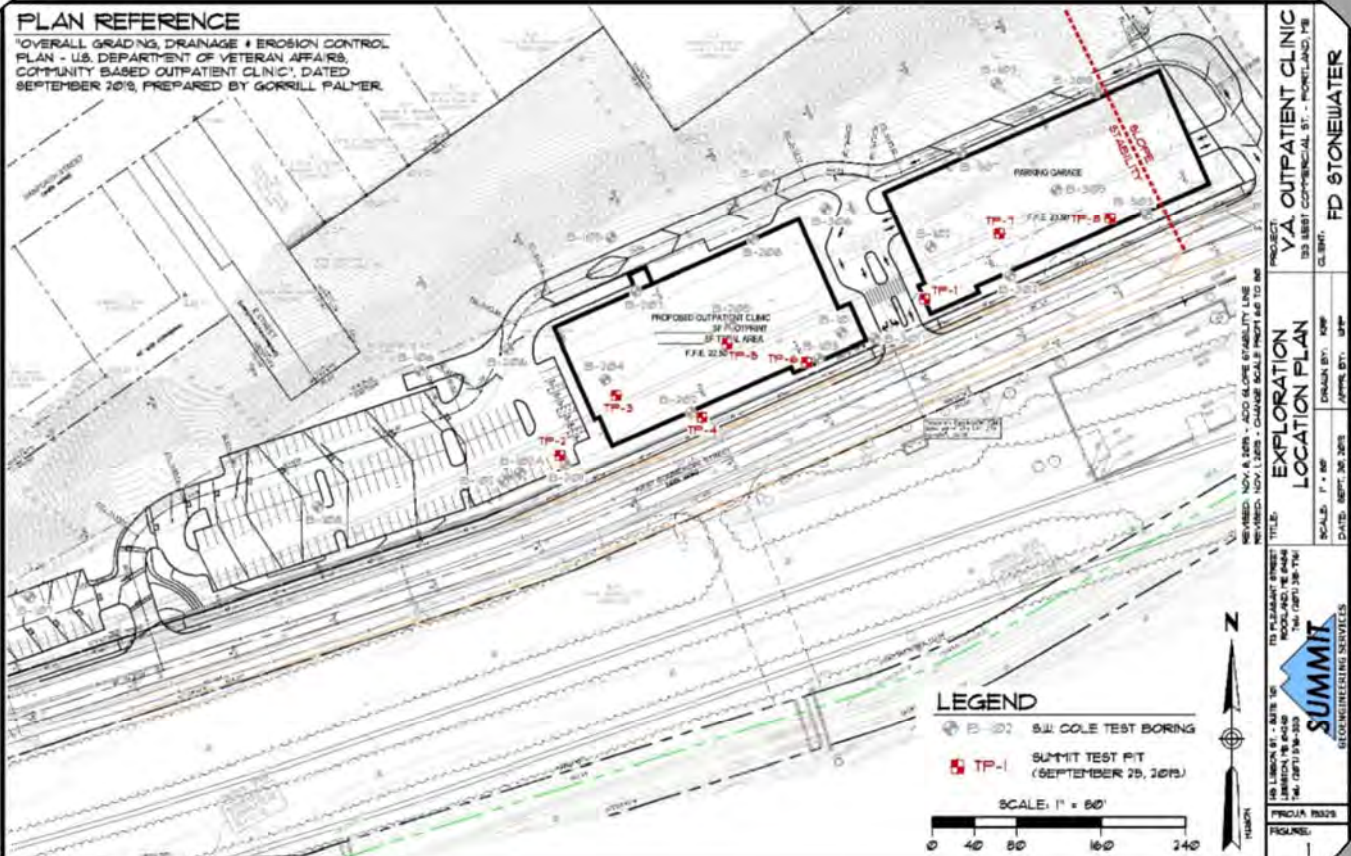
Where: Conference Call: 267-930-4000, Participant ID: 986-960-886

Weekly meeting with the design/construction team for the VA Portland Project.

The key to success starts with a solid foundation.
ENGINEERING | EXPLORATION | EXPERIENCE

Geotechnical Report

New VA COBC and Parking Garage West Commercial Street, Portland, Maine



Client

FDS JBB Portland, LLC
c/o Fd Wtonewater, LLC
1001 19th Street North, Suite 1401
Arlington, VA 22209

145 Lisbon Street (PO Box 7216) Lewiston, Maine 04243 | (207) 576-3313
173 Pleasant Street Rockland, Maine 04841 | (207) 318-7761
www.summitgeoeng.com

Project #: 19329
Date: 11/08/2019

November 8, 2019
Summit #19329

Claiborne Williams
FDS JBB Portland, LLC
c/o FD Stonewater
1001 19th Street North, Suite 1401
Arlington, VA 22209

Reference: Geotechnical Investigation, Proposed VA CBOC and Parking Garage
West Commercial Street, Portland, Maine

Dear Claiborne;

Summit Geoengineering Services, Inc. (SGS) has completed a geotechnical investigation for the proposed VA CBOC and Parking Garage at West Commercial Street in Portland, Maine. Our scope of services included reviewing available information, including a preliminary geotechnical report prepared by S.W. Cole Engineering, observing 8 test pits at the site, performing laboratory tests, and preparing this geotechnical report summarizing our findings and providing geotechnical recommendations for the design and construction of the new building and parking garage foundations.

Our scope of services for this project did not include an environmental site assessment or further investigation for the presence or absence of hazardous or toxic material on, below, or around the site. No hazardous materials were encountered in the test borings completed at the site.

1.0 Project and Site Description

The project consists of the construction of a new 2 story MOB with a footprint of approximately 250 feet by 120 feet and a 2 to 3 story parking garage with a footprint of approximately 280 feet by 120 feet. The MOB will have a slab on grade at or near elevation 22.5 feet. The parking garage will have a pavement or concrete ground surface at or near elevation 23.5 feet. The proposed loads are as follows:

CBOC:	DL = 20 kips to 162 kips LL = 23 kips to 179 kips
3-Story Garage:	DL = 78 kips to 962 kips LL = 20 kips to 471 kips
2-Story Garage:	DL = 55 kips to 675 kips LL = 14 kips to 330 kips

Additional construction includes paved driveways and parking lots and retaining walls.

The existing site is an open field with grass and brush. An abandon rail line is present adjacent to West Commercial Street. The ground surface in the proposed CBOC area is relatively flat ranging in elevation from 22 feet to 24 feet. The ground surface in the southern two-thirds of the proposed parking garage ranges from elevation 22 feet to elevation 25 feet. The grade rises steeply to the north up to elevation 40 feet in the northeast corner of the footprint. Cuts of up to 20 feet will be required to construct the proposed parking garage. The cuts will require retaining walls.

2.0 Subsurface Exploration and Laboratory Testing

2.1 SGS Subsurface Explorations

SGS observed the subsurface conditions with the excavation of 8 test pits on September 25, 2019. The tests pits were excavated to depths ranging from 8 to 13 feet by Shaw Brothers using a tracked excavator under the direction of SGS. The location of the test pits are shown on the Exploration Location Plan in Appendix A. Logs of the test pits are included in Appendix B.

2.2 S.W. Cole Engineering Subsurface Explorations

A total of 7 test borings were completed by S.W. Cole Explorations, LLC in September 2015. An additional 17 test borings were completed at the site in July 2019, also by S.W. Cole Explorations, LLC. The location of the borings are presented on the Exploration Location Plan in Appendix A. Logs of the borings are included in Appendix C.

2.3 Laboratory Testing

A grain size analysis and moisture content test was performed on a sample taken at a depth of 4 to 6 feet at the TP-3 location. The grain size test indicated that the sample contained 15% gravel, 84% sand, and 1% silt. The moisture content was 2.5%. A report of the tests are included in Appendix D.

3.0 Subsurface Conditions

3.1 Soil

The following subsurface layers and thicknesses were encountered in our investigation,

- **Fill**
- **Glaciomarine Fan** (*interbedded sand and gravel with local silty clay drapings*)

The **Fill** was encountered starting at the ground surface and extending to a depth of approximately 3 feet to greater than 13 feet (TP-8 location) below the ground surface. The composition of the fill encountered in the test pits is summarized in the following table.

FILL DESCRIPTION		
Location	Thickness	Description
TP-1	3 ft	Silty sand with thin layer of ash
TP-2	10 ft	Silt with ash (1 ft) <u>over</u> gravelly sand, trace silt, asphalt piece at 6 ft
TP-3	9 ft	Silt with trace ash (1 ft) <u>over</u> sand, little gravel, trace silt
TP-4	8 ft	Silt with trace ash and gravel (1 ft) <u>over</u> gravelly sand, trace silt
TP-5	4 ft	Silt with trace ash and gravel (1 ft) <u>over</u> gravelly sand, trace silt
TP-6	3 ft	Silt with trace ash and gravel (1 ft) <u>over</u> gravelly sand, trace silt
TP-7	10 ft	Sand, little gravel <u>over</u> silty clay mixed with sand, <u>over</u> sandy gravel, little silt trace clay
TP-8	13+ ft	Sand, little gravel <u>over</u> gravelly sand, little silt mixed with clay balls

In general the fill was dry and loose except at the TP-7 and TP-8 locations where it was firm or compact. There were no man-made products or organic material observed in the fill soil. The grain size test at a depth of 4 to 6 feet at the TP-3 location indicated that the sample contained 15% gravel, 84% sand, and 1% silt.

The **Glaciomarine Fan** deposit is generally composed of layers of sand and sand and gravel. Periodic layers of silty clay and clayey silt were encountered (TP-7, B-108, B-202, B-203, B-204, B-205, B-301, B-302, B-304, B-308, B-102) at various depths and thicknesses.

The SPT-N values in the sand and sand and gravel deposits ranged from 7 to 93 and averaged 26 blows per foot. SPT-N values in the silty clay layers ranged from 2 to 21 and averaged 9 blows per foot.

Detailed descriptions of the soil types and stratigraphy are included on the logs in Appendix B and C.

3.2 Bedrock

Refusal was not encountered at the site in the borings or test pits. The deepest boring was drilled to a depth of 40 feet below the existing ground surface (elevation -18 feet).

3.3 Groundwater

Groundwater was observed in the S. W. Cole Engineering borings ranging from elevation 3 feet to elevation 5 feet. Groundwater levels are shallower as the grade rises to the north.

Groundwater levels do fluctuate seasonally and the recorded level may be higher or lower than the actual levels during the construction period. Groundwater levels will generally be lower in the middle of the summer and winter and higher in the spring and fall.

4.0 Geotechnical Evaluation

In general the soil at the site is suitable to support the proposed building and parking garage. The geotechnical challenges are the presence of loose pockets or fill in specific areas, periodic layers of silty clay, the large magnitude of the parking garage loads, and the deep cut at the north and northeast sides of the proposed parking garage.

The pockets of loose fill and silty clay can be densified by proof rolling and local ground improvement such as geotextile and crushed stone can be used to allow for use of conventional spread footings for both structures. The majority of the parking garage loads are dead loads. These loads will cause immediate settlement of the underlying soil. Additional settlement will occur incrementally as additional structure is built. This process will allow for adjustments to be made to the structure as it is built, if necessary, to accommodate small settlements. After the structure is built, the only remaining loads creating settlement will be the live loads.

A global stability analysis was performed on the areas where deep excavation into the ground and retaining walls will be required. In general the cut slopes will be stable. Recommendations for maximum slope steepness and design and construction of the retaining walls are presented in this report.

5.0 Geotechnical Recommendations

5.1 Foundation Bearing Pressure

We anticipate that footings will be constructed on the native glaciomarine fan deposit or existing fill soil. Based on our analyses and assuming that the following guidelines are used, the proposed building and parking garage can be supported on conventional isolated and continuous spread footings proportioned using an allowable bearing pressure of 3,000 psf.

The total settlement at the proposed building associated with this bearing pressure is estimated to range from 0.4 inches to 0.8 inches. The total settlement at the proposed parking garage location is estimated to range from 0.6 inches to 1.2 inches. Differential settlement at both the building and parking garage will be negligible.

5.1.1 Subgrade Preparation Proposed Building. The above allowable bearing pressure and associated settlement are based on the following subgrade preparation recommendations for the CBOC.

- Excavate the building footprint to 12 inches below the base of the proposed slab.

- Proof roll entire building footprint using a vibrator compactor having a minimum weight of 10 tons and making a minimum of 6 passes in each of two perpendicular directions. This is intended to densify the existing fill soil.
- Excavate to the base of the footings. Proof roll the exposed subgrade by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
- Notify SGS to observe the footing subgrade conditions.
- Construct the footing directly on the proof rolled native soil, unless otherwise directed by SGS.

5.1.2 Subgrade Preparation Proposed Parking Garage. The above allowable bearing pressure and associated settlement are based on the following subgrade preparation recommendations for the parking garage.

- Excavate the building footprint to 12 inches below the base of the proposed slab.
- Proof roll entire building footprint using a vibrator compactor having a minimum weight of 10 tons and making a minimum of 4 passes in each of two perpendicular directions. This is intended to densify the existing fill soil.
- Excavate to 12 inches below the base of the footings for a 2-story structure and 24 inches below the base of footings for a 3-story structure. Proof roll the exposed subgrade by making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons.
- Install a layer of woven geotextile such as Mirafi RS280i or approved equivalent on the proof-rolled subgrade soil. Extend the geotextile at least 3 feet beyond the edge of the footing all around.
- Place a minimum of 12 inches (2-story structure) or 24 inches (3-story structure) of $\frac{3}{4}$ inch crushed stone directly on the geotextile. Compact the stone with a vibratory plate compactor.
- Construct the footing directly on the compacted crushed stone. For exterior column footings the crushed stone can be included in the frost protection depth if desired, reducing the minimum depth from the bottom of the footing to the exterior finished grade to 3 feet.

5.2 Frost Protection

The design air freezing index for the Portland area is approximately 1,200 degree F days (10 year, 90% probability). Based on this, a total of 4 feet of frost protection should be provided for the exterior footings. For the parking garage the 12 inches of $\frac{3}{4}$ inch crushed stone can be considered in the total frost protection depth reducing the depth of the bottom of the footing from the exterior finished grade to 3 feet.

We recommend that the exterior of all foundation elements exposed to freezing temperatures can be backfilled with Foundation Backfill (FB). FB shall consist of soil having a maximum particle size of 4 inches and having a maximum of 7% finer than the #200 sieve. FB should be placed in 6 to 12 inch lifts and compacted to 95% of its optimum dry density determined in accordance with ASTM D1557.

We recommend that the backfill on the interior of the foundation walls in heated areas consist of Structural Fill (SF, see Section 5.4).

5.3 Seismic Design

Based on the subsurface data collected in the borings, we recommend Site Class D be used in accordance with the ASCE 7-16 Code. The following seismic site coefficients should be used:

SUBGRADE SITE SEISMIC DESIGN COEFFICIENTS - IBC	
Seismic Coefficient	Site Class D
Short period spectral response (S_s)	0.281
1 second spectral response (S_1)	0.072
Maximum short period spectral response (S_{MS})	0.443
Maximum 1 second spectral response (S_{M1})	0.172
Design short period spectral response (S_{DS})	0.295
Design 1 second spectral response (S_{D1})	0.115

There are no soil conditions at this site that are considered susceptible to liquefaction during seismic events.

5.4 Slabs-on-Grade

We recommend that slabs on grade in heated areas placed on a minimum of 12 inches of Structural Fill (SF, see table below) or $\frac{3}{4}$ " crushed stone (CS). If SF is used, it should be compacted to 95% of ASTM D1557. The subgrade soil beneath the CS or SF should be proof rolled by making a minimum of 6 passes in each of two perpendicular directions using a vibratory rolled with a minimum operating weight of 10 tons (see Section 5.1). Soft and loose areas or areas containing demolition debris, organics, and similar unsuitable materials should be removed and replaced with SF or CS.

Where fill is required beneath the SF under the slab, it should consist of FB as described in Section 5.2 above. FB should be placed in 12 inch lifts and be compacted with a minimum of 4 passes in each of two perpendicular directions with a vibratory roller.

We recommend that slabs-on-grade constructed in unheated building areas or exterior slabs be constructed on a minimum of 24 inches of SF or 1 inch of rigid insulation placed over 12 inches of SF.

STRUCTURAL FILL (SF)	
Sieve Size	Percent finer
3 inch	100
$\frac{1}{2}$ inch	35 to 80
$\frac{1}{4}$ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type

CRUSHED STONE ¾ INCH	
Sieve Size	Percent finer
1 inch	100
¾ inch	90 to 100
1/2 inch	20 to 55
3/8 inch	0 to 15
No. 4	0 to 5

Reference: MDOT Specification 703.12, Crushed Stone ¾"

SF have a maximum particle size of 4 inches. SF should be compacted to 95% pf ASTM D1557. CS should be compacted with a vibratory compactor to lock the particles together.

5.4 Asphalt Surfaces

Based on the proposed finish grades within the building footprint, the pavement base soil will be constructed on the existing or imported fill or the glaciomarine fan deposit. The mean annual freezing index for the Portland area is estimated at 900 degree F days. Based on the subgrade soil type and mean annual freezing index, the anticipated mean annual frost penetration depth is 36 inches. Traffic is anticipated to consist of primarily cars and light trucks.

Based on the above, we recommend a minimum total pavement section thickness of approximately 60% of the mean annual frost penetration or approximately 21 inches. We further recommend that the pavement section consist of the following materials.

PAVEMENT SECTION MATERIALS AND THICKNESSES		
Material	Thickness (in)	Specification
Asphalt Binder Course	3	MDOT 703.09, Type 19 mm
Base Soil	3	MDOT 703.06, Type A
Subbase Soil	15	MDOT 703.06, Type D

Where fill is required beneath the subbase soil it should consist of FB as described in Section 5.2 above. We recommend that FB, base soil, and subbase soil be compacted to a minimum of 95% of ASTM D1557.

Based on the subsurface data, pavement underdrains are not necessary at this site.

5.5 Groundwater Control

Based on observed groundwater levels, groundwater ranges from elevation 3 to elevation 5 feet. This is well below the footings and underdrains are therefore not strictly necessary. It is generally good practice to install

perimeter underdrains to account for surface water infiltration and unanticipated changes in local and regional hydrogeology. If perimeter underdrains are used they should consist of 4 inch rigid perforated PVC placed adjacent to the exterior footings and surrounded by a minimum of 6 inches of crushed stone wrapped in filter fabric to prevent clogging from the migration of the fine soil particles in the foundation backfill soils. The underdrain pipe should be outlet to a location where it will be free flowing. Where exposed at the ground surface, the ends of pipes should be screened or otherwise protected from entry and nesting of wildlife, which could cause clogging.

We also recommend exterior grades slope away from the buildings to reduce runoff water from infiltrating the foundation backfill soils.

5.6 Exterior Retaining Walls

We recommend that the segmental block retaining wall be designed by a qualified Maine Licensed P.E.

All topsoil, loose soil, or organic soil should be removed entirely from within the proposed retaining wall footprint prior to construction of leveling pad. We anticipate that the retaining wall will be constructed on existing fill or the native glaciomarine fan deposit. We recommend that the leveling pad consist of a minimum 12" thick layer of $\frac{3}{4}$ " crushed stone. A woven geotextile fabric (such as Mirafi 600X) should be placed beneath the crushed stone. We recommend that the exposed soil beneath the leveling pad be proof rolled prior to placing the crushed stone. Proofrolling should consist of making a minimum of 4 passes using a vibratory plate compactor with a minimum weight of 2 tons. Any loose, wet, non-mineral, or otherwise unsuitable soil should be removed in its entirety and replaced with $\frac{3}{4}$ " crushed stone prior to installing the leveling pad.

Segmental block retaining walls should be designed in accordance with the National Concrete Masonry Association (NCMA), 3rd Edition design manual. We recommend that the walls be designed using a minimum live load surcharge of 100 psf for construction and for vehicular traffic behind the wall, as applicable.

Retaining wall backfill for gravity retaining walls and reinforced soil for geogrid reinforced retaining walls should consist of Structural Fill (SF, see table below) and be compacted to 95% of its maximum dry density in accordance with ASTM D1557. The portion of SF passing the 3" sieve shall meet the following gradation requirements:

STRUCTURAL FILL (SF)	
Sieve Size	Percent finer
3 inch	100
$\frac{1}{2}$ inch	35 to 80
$\frac{1}{4}$ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type D

The maximum particle size should be limited to 4 inches. Structural Fill should be placed in 12" loose lifts and should be compacted to a minimum of 90 percent of its maximum dry density, determined in accordance with ASTM D1557.

Soil properties presented in the table below can be used in the retaining wall design:

DESIGN PARAMETERS – SEGMENTAL BLOCK WALLS				
Soil Type	Soil Description	Unit Weight	Shear Strength	
			ϕ'	Cohesion
Foundation	Proof rolled Existing Fill or Glaciomarine Fan	125 pcf	32°	0 psf
Retained (Gravity)	Structural Fill (MDOT 703.06, Type D)	135 pcf	34°	0 psf
Reinforced (Geogrid)	Structural Fill (MDOT 703.06, Type D)	135 pcf	34°	0 psf

The selection of parameters used in the wall design are the responsibility of the wall designer.

The retaining walls can be designed using an allowable net bearing pressure of 3,000 psf assuming the recommendations above are followed. Since segmental blocks are tolerable of some differential settlement, the blocks do not need to be constructed to full frost depth.

An underdrain system should be provided continuously behind the retaining wall near its base to prevent the buildup of hydrostatic pressures. The underdrain should consist of 6" rigid perforated PVC surrounded by a minimum of 6 inches of $\frac{3}{4}$ " crushed stone and filter fabric to prevent clogging from the migration of the fine soil particles in the foundation backfill soils. The underdrain should outlet at the ends of the wall, at the low points of the wall, and through the face of the wall at a maximum spacing of 50 ft. center-to-center. Underdrains should outlet to a location where the water will be free flowing and should be protected from nesting animals.

We recommend that a $\frac{3}{4}$ " crushed stone column, with a minimum thickness of 12", be installed behind the entire wall between the back of the concrete and the wall backfill to allow for any infiltrated water behind the wall to drain down to the underdrain pipe. No geotextile is required between the crushed stone and the retaining wall backfill. We recommend that geotextile, such as Mirafi 180N, be installed on the face of the cut slopes between the native soil and the retaining wall backfill.

We recommend that the final wall design be made available for SGS to review prior to construction.

6.0 Earthwork Considerations

6.1 Excavations and Slope Stability

The table below summarizes the OSHA general excavation guidelines for occupied excavations for the soils encountered in our geotechnical explorations.

OSHA Excavation Slopes		
Soil	OSHA Classification	Permissible Slope
Existing Fill	Type C	1.5H:1V
Native Glaciomarine Fan	Type B	1H:1V
Silty Clay	Type B	1H:1V

The above permissible slopes are for soil above the groundwater table. If any excavated soil is found to be below the groundwater table and is not de-watered, the permissible slope for the submerged soil is 1.5H to 1V. Any excavations greater than 20 feet deep should be designed by a qualified Maine Licensed Professional Engineer.

A global stability analysis was performed for static conditions at a deep cut section at the northeast corner of the parking garage. Three conditions were analyzed: Case 1) cut slope with no retaining wall, Case 2) cut slope with geogrid reinforced retaining wall, and Case 3) cut slope with gravity retaining wall. The stability analyses were performed using the SLIDE 2018 computer program and the Spencer method. The results of the analyses are summarized in the table below.

RESULTS OF SLOPE STABILITY ANALYSES	
Condition	Safety Factor
Open Cut Face - 2H:1V	1.55
Gravity Retaining Wall	1.55
Geogrid Reinforced Retaining Wall	1.60

Based on the results of these analyses, the maximum safe permanent grade of open cuts is 2H:1V. Our global stability analyses indicate that both gravity and geogrid reinforced retaining walls will be stable.

6.2 Handling and Reuse of Existing Soil.

Based on the results of the grain size analysis, the vast majority of the existing fill soil will meet the requirements for FB but will not meet the requirements for SF. A grain size analysis was not performed on the glaciomarine fan deposit. We anticipate that the majority of this deposit will also be usable as FB. We recommend that grain size analyses be performed on representative samples of the existing soil at the site to confirm compliance to the specifications in this report prior to their use.

SGS did not perform an environmental assessment on the existing fill soil. We did not observe contaminated soils with the exception of a thin layer of ash at or near the existing ground surface. Where possible we recommend that excess fill be used at the site. SGS can work with the Contractor and Owner to find potential places to use these materials on site, depending on their characteristics. Requirements for handling of contaminated soil should be determined by a qualified environmental consultant.

6.3 Earthwork Monitoring.

SGS should be notified so that we can make observations of the footing subgrade soil (existing fill) for both the CBOC and parking garage buildings prior to the placement of footing or geotextile and crushed stone.

We recommend that a qualified geotechnical consultant be retained to monitor and test soil materials used during construction and confirm that soil conditions and construction methods are consistent with this report.

7.0 Closure

Our recommendations are based on professional judgment and generally accepted principles of geotechnical engineering and project information provided by others. Some changes in subsurface conditions from those presented in this report may occur. Should these conditions or the proposed development differ from those described in this report, SGS should be notified so that we can re-evaluate our recommendations.

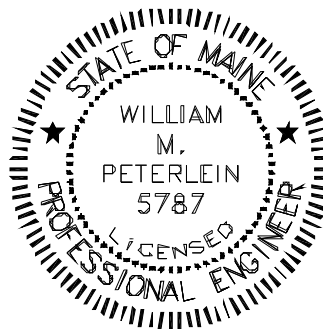
It is recommended that this report be made available in its entirety to contractors for informational purposes and be incorporated in the construction Contract Documents.

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

Sincerely yours,
Summit Geoengineering Services, Inc.



William M. Peterlein, PE
President & Principal Engineer

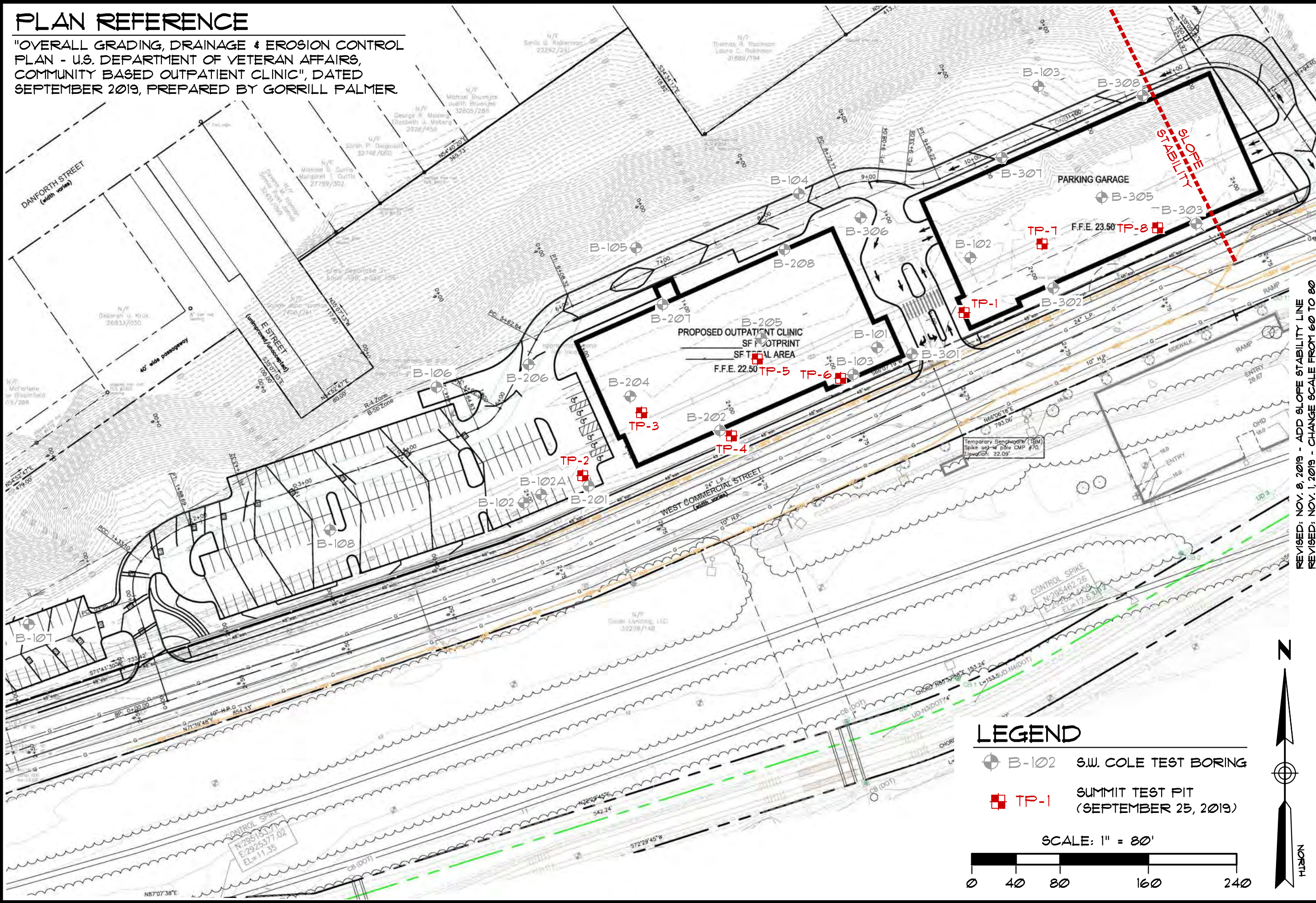


APPENDIX A

EXPLORATION LOCATION PLAN

PLAN REFERENCE

"OVERALL GRADING, DRAINAGE & EROSION CONTROL
PLAN - U.S. DEPARTMENT OF VETERAN AFFAIRS,
COMMUNITY BASED OUTPATIENT CLINIC", DATED
SEPTEMBER 2019, PREPARED BY GORRILL PALMER



APPENDIX B

SGS EXPLORATION LOGS



TEST PIT LOG

Test Pit # **TP-1**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 21.5 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1 _	Brown Silty SAND, trace Gravel, thin layer of ash, dry, loose, SM	FILL
2 _		
3 _		
4 _	Brown SAND, little Gravel, trace Silt, moist, compact, SP	NATIVE GLACIOMARINE FAN
5 _		
6 _		
7 _	Olive-gray to olive-brown fine Sandy SILT, trace Clay, blocky, damp, slightly mottled, firm, ML	
8 _		
9 _	End of Test Pit at 8 ft	
10 _		
11 _		
12 _		
13 _		
14 _		
15 _		
16 _		
17 _		



TEST PIT LOG

Test Pit # **TP-2**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 23 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT mixed with ash, dry, loose, ML	TOPSOIL
2	Brown Gravelly SAND, trace Silt, dry, loose, SP Becomes moist at 3 ft Isolated asphalt piece at 6 ft	FILL
3		
4		
5		
6		
7		
8		
9		
10		
11	Brown medium to fine SAND, trace Silt, moist, loose to compact, SP	NATIVE GLACIOMARINE FAN
12		
13	End of Test Pit at 12 ft	
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-3**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22.5 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Brown SAND, little Gravel, trace Silt, dry to moist, loose, SP 15% Gravel, 84% Sand, 1% Silt	FILL
3		
4		
5		
6		
7		
8		
9		
10	Gray Silty SAND, trace Clay, wet, firm, SM	NATIVE GLACIOMARINE FAN
11	End of Test Pit at 10 ft	
12		
13		
14		
15		
16		
17		

		TEST PIT LOG		Test Pit # TP-4
		Project: Veterans Outpatient Clinic 133 West Commercial St Portland, Maine		Project #: 19329
				Groundwater: None Observed
Contractor: Shaw Brothers		Ground Surface Elevation: 21.5 ft+/-		
Equipment: CAT Large Tracked Excavator		Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19		
Summit Staff: B. Peterlein, P.E.		Date: 9/25/2019	Weather: Sunny	
Depth (ft)	DESCRIPTION			
	ENGINEERING		GEOLOGIC/GENERAL	
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML		TOPSOIL	
2	Brown Gravelly SAND, trace Silt, dry, loose, SP		FILL	
3				
4				
5				
6				
7				
8				
9	Olive-brown medium to fine SAND, trace Silt, moist, compact, SP		NATIVE GLACIOMARINE FAN	
10	End of Test Pit at 10 ft			
11				
12				
13				
14				
15				
16				
17				



TEST PIT LOG

Test Pit # **TP-5**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Brown Gravelly SAND, trace Silt, dry, loose, SP	FILL
3		
4		
5	Brown medium to fine SAND, trace Silt, moist, compact, SP	NATIVE GLACIOMARINE FAN
6		
7	Olive-gray medium to fine SAND, trace Silt, trace Clay, moist, compact, SM	
8		
9	End of Test Pit at 8 ft	
10		
11		
12		
13		
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-6**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 21 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Dark brown Gravelly SAND, trace Silt, dry, loose, SP	FILL
3		
4	Brown medium to fine SAND, trace Gravel and Silt, moist, loose, SP	NATIVE GLACIOMARINE FAN
5		
6		
7		
8		
9		
10		
11	End of Test Pit at 10 ft	
12		
13		
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-7**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Black SILT, trace Ash, trace Gravel, dry, loose, ML	TOPSOIL
2	Brown slightly mottled SAND, little Gravel, trace Silt, dry, loose, SP	FILL
3	Gray Clayey SILT to Silty CLAY mixed with Sand, little Gravel, moist, firm, ML	
4		
5		
6		
7	Brown Sandy GRAVEL, little Silt, trace Clay, few Clay balls, damp, compact, SM	NATIVE GLACIOMARINE FAN
8		
9		
10		
11	Brown Gravelly SAND, trace Silt, wet, compact, SP	
12		
13	End of Test Pit at 12 ft	
14		
15		
16		
17		



TEST PIT LOG

Test Pit # **TP-8**

Project: Veterans Outpatient Clinic
133 West Commercial St
Portland, Maine

Project #: 19329
Groundwater:
None Observed

Contractor: Shaw Brothers

Ground Surface Elevation: 22 ft +/-

Equipment: CAT Large Tracked Excavator

Reference: Grading, Drainage, ESC Plan, Gorrill Palmer, 9/19

Summit Staff: B. Peterlein, P.E.

Date: 9/25/2019

Weather: Sunny

Depth (ft)	DESCRIPTION	
	ENGINEERING	GEOLOGIC/GENERAL
1	Brown to black SILT, little SAND, trace Gravel mixed with black ash, dry, loose, ML	FILL
2	Brown Silghtly mottled SAND, little Gravel, trace Silt, moist, SP	
3		
4	Brown Gravelly SAND, little Silt mixed with clay balls, compact, SM	
5		
6		
7		
8		
9		
10		
11		
12		
13		
14	End of Test Pit at 13 ft	
15		
16		
17		

APPENDIX C

S.W. COLE ENGINEERING EXPLORATION LOGS



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?64ÄLCÄVN, VÄ>4ÄT 2 0 CÄd 2 G
LOCATION: W67EÄV3= 62R 13E26EÄ 32E 14@Ä

BORING NO.: **B-108**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#ISÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 E3>Ä3F/ E3>Ä1 > ELEVATION (FT): !"KÄ\$ TOTAL DEPTH (FT): Ä)S LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/E3>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ ÄC<G2
RIG TYPE: M2FÄ 3<>E4ÄCH 62 AUGER ID/OD: ÄÄÄ#Ä0\$ÄÄ 3Ä> SAMPLER: BE >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä3 * Ä&ÄÄ30?Ä?/E2/E4Ä EÄ K

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä9611 ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/E9Ä96GEJ W, ÄUÄW6GJEÄ3Ä-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄD-G YÄÄÄÄÄW164ÄM56ÄB = R6 -6F SÄÄF3162H6>GE W, ÄUÄW6GJEÄ3Ä)/= 62 W, ÄUÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 -Ä ÄUÄ3F [Ä </10Ä6? G>/E3Ä ÄUÄ2FE3>ÄG G6Ä7P6 /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄBJ6/2 = ROÄUJ0<E6Ä62Ä3E T8ÄUÄT J3E33>0/E3>Ä 6E6E32 D\$CÄÄ3EÄÄRÄF/516

P6I S 7OE:	6 R6 7OE:	V/? 0-G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D					a2/R J0Ä9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ E3>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	MIR6	6 R6 7OE:	T6>\$ -6 FS 79:	N8A V3<>E 32 Ä				
!			Ä	!	!	!	!	!	!	!	!
(			!	(	(	(	(	(	(	(	(
Ä(			"	Ä"Ä!	Ä"Ä!	Ä"Ä!	Ä"Ä!	Ä"Ä!	Ä"Ä!	Ä"Ä!	Ä"Ä!
Ä*			#	Ä(Ä)	Ä(Ä)	Ä(Ä)	Ä(Ä)	Ä(Ä)	Ä(Ä)	Ä(Ä)	Ä(Ä)
Ä*											
Ä(											



BORING LOG

CLIENT: + B&NNA321 >4@9V
PROJECT: T2R3?64ÄLCÄV/N, VÄ>4ÄT 2 0-CA 2 G
LOCATION: W67ÄV3 = 62R 1B26E 32E 14@Ä

BORING NO.: **B-201**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !)S* LOGGED BY: M 0 Ä3H6
DRILLING CO.: BSVSÄ36ÄRR82/B>?@ÄV DRILLER: V32HÄV<110S DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9/Ä> SAMPLER: BE >4/24ÄBRÄBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä3 * Ä&Ä26ÄÄ B2ÄEÄ K

GENERAL NOTES:

KEY TO NOTES: W/ CEÄÄ96!! ÄÜBRÄEÄ33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä9@GEJ W, -ÄÜW6GJEÄÄ34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3I 62H6>GÄ W, ÄÄÄV6GJEÄÄ3Ä/ = 62 W, ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3ÄÄ 20110> -ÄÜÄF [Ä/32ÄB = R6 -Ä ÄÜÄ3F [Ä <10Ä6? G>/E3 ÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE6ZÄÄG LÄÄ+08ÄL>6ÄBJ6/2 = ROÄÄJ0<E6Ä62Ä3E T8ÄÄJ3E33>0EG>Ä 6E6B2 D\$CÄÄ3EÄÄRÄ/516

P6I S 7OE:	6 R6 7OE:	V/? 0-G T6>S 7RO:	BC;T 9PÄD+, - ;C M8 D					a2IRJ0Ä9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ B>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	MIR6	6 R6 7OE:	T6>\$ -6 FS 70:	N8A V3<>E 32 Ä				
!* (Ä(Ä* Ä* Ä((!* * !(			Ä	X	!#	!#\$Ä)	""!"		a 2 ??Ä\$Ä9?6@Ä3A>Ä?HÄBD Ä789:		
			!	X	()	!#\$!!	""#Z#		"S" 933?6@Ä5[ÄF3 1CB]Ä7+89: ; 640<= Ä6>?6ÄEÄ3?6@Ä3A>Ä?HÄBD @ BZF 6Ä2I 61Ä2 F6Ä1 HÄ+89:		
			"	X	Ä**Ä!	!#\$Ä#	(('))		(S% ; 640<= Ä6>?6Ä23A>Ä2I 61HÄCD @ÄF 6 ?0ÄE89:		
			#	X	Ä('Ä)	!#\$Ä)	&'&'')		%S ; 640<= Ä6>?6@ÄHÄCD @ÄEÄ2I 61		
			(	X	!#!	!#\$Ä)	%&'Z' Ä*		Ä)S ; 640<= Ä6>?6Ä23A>G2HÄCD @2/F6 GZ 16ÄÄÄÄ02<6>EÄHÄF#Ä?6= ?ÄY 2532 N3EÄ8: ZÄBÄÄÄ32J36Ä5/ >43>64ÄÄÄK		

N3EÄ8ÄÄQR82 B>ÄEÄÄSÄCÄE

BÄE E00 E3>Ä06?ÄQR268>EÄRR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE208>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä<>462ÄF>4E3>?ÄFE64S
+ÄFE</E3>?Ä30Ä8S>4Ä/E62Ä#Ä3F<2Ä4<6Ä8E
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE06
= 6/? <2= 6>EÄ62ÄÄ=46S

BORING NO.: **B-201**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?64ÄLCÄV/N, VÄ>4ÄT 2 0 CÄd 2 G
LOCATION: W67EÄV3 = 62R0 Ä26EÄ 32E 14@Ä

BORING NO.: **B-203**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * & #! SÄ
DATE START:)\$Ä%Ä *Ä&
DATE FINISH:)\$Ä%Ä *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !)S* LOGGED BY: M0 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#Ä0\$ÄÄ\$Ä> SAMPLER: BE>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄ\$D\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄ\$ Ä2Ä \$ÄÄ * ÄÄÄ26ÄÄ B2ÄEÄ \$K

GENERAL NOTES:

KEY TO NOTES: W/ E2Ä96!! ÄÜBRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B0Ä9@GEJ W, -ÄÜW6GJEÄÄ-34? B,ÄÜ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄD-G YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3I 62Ä6>GÄ W, ÄÄÄV6GJEÄÄ)/= 62 W, ÄÄY>B>064ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/32ÄB = R6 -Ä ÄÜÄ3F [Ä <10Ä6? G>/E3Ä ÄÄÄFE3>ÄG6Ä7PÄ /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄB6/2 = R0ÄÄJ0<E6Ä62Ä3E T8ÄÄÄJ3E3>0/E0>Ä 6E6B2 D\$CÄÄ3EÄÄRÄ/516

P6I S 7OE:	6 R0 7OE:	V/? 0-G T6>S ÄR0:	BC;T 9PÄD+, - ;C M8 D				a2/RJ0Ä9G	B/ = R6 6?F2FE3>Äb V1 ??0F/ B>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	M8	6 R0 7OE:	T6>\$ -6 FS 70: Ä				
!*			Ä	!#	!#\$Ä"	('Z('Z		N23A>Ä0HBCD Ä+09:		
(			!	(	!#\$Ä(	#'))		IS* ; 640= Ä6>?6@ÄÄBCD @ÄB2P0ÄÄB 3FF/ ?>1Ä106' G2HÄ1H6H30MÄ6/= ?		
Ä(			"	Ä**Ä!	!#\$Ä%	"Z&' Ä!				
Ä*			#	Ä(Ä)	!#\$*	Ä!'Ä!)#		>3Ä6F3I 62ÄÄÄ?J0CÄ2I 61		
Ä(			(	!***	!#\$!#	""!""	ÄU' SÄ(Ä?0	IS* ; 640= \$?DE@ÄÄ3DÄV0dÄEÄÄ02<6>E BCD ÄR2E6G?		
!			Z	!(!)	!#\$!#	&Ä** !Ä'!		!(S* 6>76@106' 523Ä>Ä0HBCD ÄÄÄÄ<6>E BCD Ä6/= ?		

N3EESÄ0ÄQR82 B>ÄEÄÄSÄC0E

BÄE E00 E3>Ä06?ÄQR268>EÄRR230/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20E>?Ä=/H
56ÄG2/4</\$ÄVE62Ä16/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄFE64S
+ÄFE</E0>?Ä30ÄS>4Ä/E62Ä#ÄÄ3F<2Ä4<6ÄE
3EJ62ÄC0E2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE06
= 6/? <6= 6>EÄ62Ä=46S

BORING NO.: **B-203**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄLCÄ/V, VÄ>4ÄT 1 0 CÄd 2 G
LOCATION: W67ÄV3 = 62R 1B26E 32E 14@Ä

BORING NO.: **B-204**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä%8 *Ä&
DATE FINISH:)\$Ä%8 *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !Z\$S* LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ ÄC<G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9Ä> SAMPLER: BÄ >4/24ÄBRÄBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä8 * Ä&Ä26ÄÄ B2ÄEÄK

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄÜBRÄEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä96GEJ W, -ÄÜW6GJEÄÄ34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3! 62Ä6>GÄ W, ÄÄÄV6GJEÄÄ3Ä/ = 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/32ÄB = R6 5ROÄMBA?ÄR62Ä3E -Ä ÄÜÄ3F [Ä </10Ä6? G>/E3Ä ÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄÄG LÄÄ+08ÄL>6ÄB6/2 = ROÄÜ0<E6Ä62Ä3E T8ÄÜÄJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EÄBRF516

P6! S 7OE:	6 R6 7OE:	V/? 0-G T6>S 7RO:	BC;T 9PÄD+, - ;C M8 D					a2/RJÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ B>	J,* 6REJ	- 6= / 2[?	
			B/ = R6 D3S	M8	6 R6 7OE:	T6>\$ -6 FS 79:	N8A V3<>E 32 Ä					+0614Ä\$Ä9 M6?EÄ Æ
!* (Ä(Ä* Ä* Ä((!* * !(			Ä	⊗	!#	!#\$Ä	#('Z		a Z ??Ä\$Ä23/ 4ÄH24			
			!	⊗	(')	!#\$Ä	##""#		!S*			933?6@ÄB CD @ÄB2P0ÄÄBÄÄÄ

BÄ E09 E3>Ä06?ÄR268>EÄR230/E6
53<>4/ 2Ä56E86>Ä20ÄB6?@ÄE20B>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄFE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#ÄÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE06
= 6/? <B= 6>EÄ62Ä=46S

BORING NO.: **B-204**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?6ÄLCÄV/N, VÄ>4ÄT 2 0-CA 2 G
LOCATION: W67ÄV3= = 62R 1326E 32E 14@Ä

BORING NO.: B-205
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$Ä%8 *Ä&
DATE FINISH:)\$Ä%8 *Ä&

Drilling Information

LOCATION: B66ÄQR82 B3>Ä3F/ E3>Ä1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !!S* LOGGED BY: M0 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B3>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄE6 ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9/4> SAMPLER: BE >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄ \$Ä8 * Ä&Ä26ÄÄ B2ÄEÄK

GENERAL NOTES:

KEY TO NOTES AND SYMBOLS: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä9@GEJ W, ÄUÄW6GJEÄ3Ä-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄF31 62H6>GE W, ÄUÄV6GJEÄ3Ä)/= 62 W, ÄUÄY>B>O64ÄV3=R6?706ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 -Ä ÄUÄ3F [Ä <10Ä6? G>/E3Ä ÄUÄ2FE3>ÄG6Ä7P6 /E64:
V COE62ÄÄG LÄÄ+08ÄL>6ÄBJ6/2 = ROÄUÄ0<E6Ä62Ä3E T8ÄUÄT J3E33>0/E3>Ä 6E6B2 D\$CÄÄ3EÄRÄF/516

P6I S 7OE:		6 R6 7OE:		V/? 0-G T6>S 7RO:		BC;T 9PÄD+, - ;C M8 D				a2/R J0Ä9G		B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
						B/ = R6 D3S	MIR6	6 R6 7OE:	T6>S -6 FS 70:	N8A V3<>E 32 Ä	+08Ä\$Ä9 M6?EÄ Ä						
!* (Ä(Ä* Ä* Ä((!* *						Ä	Ä	!#	!#\$(	ZZ('Z		a 2 ??Ä\$Ä23/ 4ÄH24					
						!	!	(	!#\$(	####		!S* ; 640= Ä6>?6@ÄÄCD @ÄB2ÄE					
						"	"	Ä**Ä!	!#\$(	#"'"#		!S% a 2 HÄ?>4HÄBDM					
						#	#	Ä(Ä)	!#\$(	ÄÄ'Ä!'	(#	933?6@Ä26 4ÄE/BCD @ÄB2ÄEÄ4ÄÄ H					
												?/ >4HÄBMAEÄF3556?ÄÄK					
												&S 933?6@Ä2 HÄ1H6HÄB89MÄ3= 6Ä/ >4					
												Ä(S ; 640= Ä6>?6@ H626Ä523Ä>ÄCD @Ä3= 6					
												G2I 6Ä>4Ä2HÄ1 H6HÄB89MÄ2 F6Ä/ >4					
												!S* L62HÄ6>?6@23Ä>ÄCD @Ä3= 6Ä2I 61Ä2F 6					
												201E					

ÄÄBÄÄ@5/ >43>64Ä32J36ÄEÄ! K
N3EE8ÄOÄR82 B3>ÄEÄ!SÄCÄE

BÄE E00 E3>Ä06?ÄR268>EÄRR230E/E6
53<>4/ 2Ä56E86>Ä20ÄB6?@ÄE20E>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ÄFE</E3>?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE6
= 6/? <Ä= 6>EÄ62Ä=46S

BORING NO.: B-205



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄICÄ/V, VÄ>4ÄT 1 0-ÇÄ 2 Ç
LOCATION: W67ÄV3= 62R 1B26E 32E 14@Ä

BORING NO.: **B-207**
SHEET: ÄÄÇÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !"KÄ\$ TOTAL DEPTH (FT): !!S * LOGGED BY: M 0 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄ<1106 DRILLING METHOD: J 31BAÄE 6 Ä<G62
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#A0\$ÄÄ\$Ä> SAMPLER: BÄ>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄ\$ ÄÄÄ\$ ÄÄÄ\$ * ÄÄÄ26ÄÄ B2ÄEÄ\$ K

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄÜBRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä96GEJ W, -ÄÜW6GJEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3162Ä6>GÄ W, ÄÄÄV6GJEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄF [Ä/32ÄB = R6 -Ä ÄÜÄ3F [Ä </10Ä6? G>/E3 ÄÄÄ2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD G LÄÄ+08ÄL>6ÄBJ6/2 = R6ÄÄ0<E6Ä62Ä3E T8ÄÄÄJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EÄÄR/516

P6I S 7OE:		6 R6 7OE:		V/? 0-G T6>S ÄRO:		BC;T 9PÄD+, - ;C M8 D				B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
						B/ = R6 D3S	M8	6 R6 7OE:	T6>S -6 FS 70:	N8A V3<>E 32 Ä	+08Ä\$Ä9 M6?EÄ Ä				
!						Ä	Ä	!#	!#\$Ä	Ä!('(&					
(						!	Ä	()	!#\$ÄZ	ÄZ'Ä('					
Ä(							Ä			Ä('!!					
Ä*						"	Ä	Ä**Ä!	!#\$Ä	Ä&'Ä%'					
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Ä(						#	Ä	Ä('Ä)	!#\$Ä&	!!!"					
(							Ä			Ä&"					
!						(	Ä	!""	!#\$Ä	ÄZ'Ä'					
							Ä			!""Ä					

N3EE3ÄÄQR82 B>ÄEÄ!SÄCÄE

BÄ E00 E3>Ä06?ÄQR268>EÄR230E/E6
53<>4/ 2Ä56E66>Ä20ÄB6?@ÄE20E>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ÄFE</E3>?Ä30ÄS>4Ä/E62ÄHÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ36ÄR268>EÄEÄEÄE0
= 6/? <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-207**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?64ÄICÄV/N, VÄ>4ÄT 2 0 CÄd 2 G
LOCATION: W67EÄV3 = 62R ÄB26EÄ 32E 14@Ä

BORING NO.: **B-208**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !#KÄ\$ TOTAL DEPTH (FT): Ä" S LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ\$Ä> SAMPLER: BE>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$ÄZ\$ *Ä&ÄD3Ä6Ä/E62Ä5?62 64

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä9GÄJ W, -ÄUÄW6GÄEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄUÄÄW164ÄM56ÄB = R6 -6F SÄÄF3! 62Ä6>GÄ W, ÄUÄV6GÄEÄÄ)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/32ÄB = R6 5ROÄUÄBÄ?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3Ä ÄÄ-2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD>G LÄÄ+08ÄL>6ÄB6/2 = ROÄUÄ0<E6Ä62Ä3E T8ÄUÄTJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EÄRÄF/516

P6I S 7OE:	6 R6 7OE:	V/? 0>G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D					a2/RJÜÄ9G	B/ = R6 6?F2FE3>Äb V1 ??00F/ B>	1,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	MIR6	6 R6 7OE:	T6>S -6 FS 79:	N8A V3<>E 32 -Ä				
!*	(	Ä(	Ä	!#	!#SÄ%	!(Ä' Ä(			-/ 02/ 4Ä20>GÄ\$640= Ä6>?6@ÄGÄ?4H B8MÄ89:		
			!	(	!#SÄ)	)Ä! Ä(!			"S ; 640= Ä6>?6ÄE36>?6@ÄE2 161HÄCD @ E F6Ä0EÄBÄC>6>E3556?		
			"	Ä*S' ÄÄ%	ÄÄ&	!* (*\$(.					

Ä-6G?/ ÄEÄÄÄÄ
T235/5 6Ä3<462

BÄ E0Ä E3>Ä06?ÄBR268>EÄR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20E2>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62Ä0E2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE06
= 6/? <2= 6>EÄ62Ä=46S

BORING NO.: **B-208**

BORING NO.: **B-301**

BORING NO.: B-302



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄLCÄV/N, VÄ>4ÄT 1 0 CÄd 2 G
LOCATION: W67ÄV3 = 62R Ä26EÄ 32E 14@Ä

BORING NO.: **B-304**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä%Ä *Ä&
DATE FINISH:)\$Ä%Ä *Ä&

Drilling Information

LOCATION: B66ÄQR82 EÄ>Ä3F/ EÄ>Ä1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): !!S * LOGGED BY: MÄ Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/EÄ>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>E4ÄF 62 AUGER ID/OD: ÄÄÄ#Ä0\$ÄÄ\$Ä> SAMPLER: BE>4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄÄÄÄÄÄÄÄ * ÄÄÄÄÄÄÄÄÄÄ EÄÄÄÄÄÄÄÄÄÄÄ:
GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄÜÄRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä96GEJ W, -ÄÜÄV6GJEÄÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄF3162Ä6>GÄ W, ÄÄÄV6GJEÄÄÄ/ = 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÜÄ3F [Ä/326ÄB = R6 -^ ÄÜÄ3F [Ä </10Ä6? G>/EÄ ÄÄÄEÄ>ÄG G6Ä7PÄ /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄBJ6/2 = R6ÄJ0><E6Ä62Ä3E T8ÄÄT J3E3>0/EQ>Ä 6E6E2 D\$CÄÄ3EÄÄÄ/516

P6I S 7OE:		6 RÄ 7OE:		V/? 0-G T6>S ÄRO:		BC,T 9PÄD+, - ;C M8 D		B/ = R6 6?F2FE3>Äb V1 ??00F/ EÄ>		1,* 6REJ		- 6= / 2[?	
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N3EESÄÖÄR82 EÄ>ÄEÄ!SÄCÄE

BE E0Ä EÄ>Ä06?ÄQR26E>EÄR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20E>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄE>4EÄ>?ÄE64S
+ *FE</EÄ>?Ä30ÄS>4Ä/E62Ä#ÄÄ3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR26E>EÄEÄEÄE6
= 6/? <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-304**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?6ÄICÄ/V, VÄ>4ÄT 2 0-ÇÄ 2 Ç
LOCATION: W67ÄV3= 62R 1326E 32E 14@Ä

BORING NO.: **B-305**
SHEET: ÄÄÇÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä%8 *Ä&
DATE FINISH:)\$Ä%8 *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !!KÄ\$ TOTAL DEPTH (FT): ÄZS LOGGED BY: M9 Ä3H6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄ<1106 DRILLING METHOD: J 31BAÄE6 Ä<G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#0\$ÄÄ 9Ä> SAMPLER: BÄ >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*Ä** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$Ä%8 *Ä&ÄD3Ç26Ä/E62Ä5762 64

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B9Ä96GEJ W, -ÄUÄV6GJEÄ3Ä-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3ÇÄÄG YÄÄUÄÄW164ÄM56ÄB = R6 -6F SÄÄ6F3I 62H6>GÄ W, ÄUÄV6GJEÄ3Ä)/= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3ÄÄ 20110> -ÄUÄ3F [Ä/326ÄB = R6 -^ ÄUÄ3F [Ä </10Ä6? G>/E3> ÄÄ-2FE3>ÄG6Ä7P6 /E64:
V COE62ÄÄG LÄÄ+08ÄL>6ÄBJ6/2 = ROÄUÄ><E6Ä62Ä3E T8ÄUÄJ3E33>0/EQ>Ä 6E6B2 D\$CÄD3EÄRÄF/516

P6I S TOE:		6 R6 TOE:		V/? 0-G T6>S ÄRO:		BC;T 9PÄD+, - ;C M8 D				B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
						B/ = R6 D3S	MIR6	6 R6 TOE:	T6>S -6 FS 79:	N8A V3<>E 32 _Ä	+08HÄ\$Ä9 M6?EÄ Ä				
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Ä-6G?/ ÄEÄS ÄÇE
T25/5 6Ä3<#62

BÄ E00 E3>Ä06?ÄR268>EÄR230/E6
53<>4/ 2Ä56E66>Ä20ÄB6?@ÄE2082>?Ä=H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46Ä/EÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#HÄ3F<2Ä4<6ÄE
3EJ62ÄÄ2?ÄJ/>ÄJ3 6ÄR268>EÄEÄEÄE6
= 6/? <2= 6>EÄ62Ä=46S

BORING NO.: **B-305**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T2R3?64ÄLCÄV, VÄ>4ÄT 1 0 CÄd 2 G
LOCATION: W67ÄV3= 62R 1B26Ä 32E 14@Ä

BORING NO.: **B-306**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *#!SÄ
DATE START:)\$ÄZ\$ *Ä&
DATE FINISH:)\$ÄZ\$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä 1 > ELEVATION (FT): !(KÄ\$ TOTAL DEPTH (FT): !!S * LOGGED BY: MÄ Ä3HF6
DRILLING CO.: BÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BÄÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#A0\$ÄÄ 9/Ä> SAMPLER: BÄ >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: _____ HAMMER DROP (inch): " * ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄ* ÄÄÄ \$ÄZ\$ * ÄÄÄ26ÄÄ B2Ä/EÄ K

GENERAL NOTES:

KEY TO NOTES: W/ E62Ä96!! ÄUÄRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä9@GEJ W, -ÄUÄV6GJEAÄ34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄÄG YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F3I 62H6>GÄ W, ÄUÄV6GJEAÄ3Ä/!= 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄUÄ3F [Ä/326ÄB = R6 5ROÄUÄBÄ?ÄR62Ä3E -Ä ÄUÄ3F [Ä </10Ä6? G>/E3 ÄÄÄ2FE3>ÄG G6Ä7PÄ /E64:
V COE62ÄD G LÄÄ+08ÄL>6ÄB6/2 = ROÄUÄ<E6Ä62Ä3E T8ÄUÄTJ3E3>0/E3>Ä 6E6B2 D\$CÄÄ3EAÄRÄF/516

P6I S 7OE:		6 R6 7OE:		V/? 0G T6>S 7RO:		BC;T 9PÄD+, - ;C M8 D		B/ = R6 6?F2FE3>Äb V1 ??00F/ B>		1,* 6REJ		- 6= / 2[?	
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N3EE3ÄÖÄR82 B>ÄEÄ!SÄCÄE

BÄ E00 E3>Ä06?ÄR268>EÄR230/E6
53<>4/ 2Ä56E66>Ä20ÄB6?@ÄE20B>?Ä=/H
56ÄG2/4</\$ÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46Ä/EÄE0?Ä>4Ä->462ÄF>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#Ä3F<2Ä4<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE6
= 6/? <2= 6>EÄ62Ä=46S

BORING NO.: **B-306**



BORING LOG

CLIENT: + BÄNNÄ321 >4@9V
PROJECT: T23R3?64ÄLCÄV/N, VÄ>4ÄT 1 0-CÄd 2 G
LOCATION: W67EÄV3= = 62R 13E26E 32E 14@Ä

BORING NO.: **B-307**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' *8#1SÄ
DATE START:)\$Ä) \$ *Ä&
DATE FINISH:)\$Ä) \$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B3>Ä3F/ E3>Ä1 > ELEVATION (FT): ""KÄ\$ TOTAL DEPTH (FT): "IS* LOGGED BY: M9 ÄÄ3H6
DRILLING CO.: BÄVSA36ÄRR82/B3>?@ÄV DRILLER: V32HÄV<1106 DRILLING METHOD: J 31BAÄE6 ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#Ä0\$ÄÄ\$Ä> SAMPLER: BÄ >4/24ÄRTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL:
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): ""ÄÄÄ
WATER LEVEL DEPTHS (ft): ÄÄÄZ\$ ÄÄÄ\$Ä3 * ÄÄÄÄ26ÄÄ B2ÄEÄZ\$K

GENERAL NOTES:

KEY TO NOTES: W/ E2Ä9611 ÄÄBRTEÄB33>Ä/ = R6 T6>SÄÄT6>6E2/B9Ä96GEJ W, ÄÄÄW6GJEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄD-G YÄÄÄÄÄW164ÄM56ÄB = R6 -6F SÄÄF31 62Ä6>GÄ W, ÄÄÄW6GJEÄÄ/ = = 62 \,ÄÄY>B>O64ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3>ÄÄ 20110> -ÄÄÄF [Ä/32ÄB = R6 5ROÄÄBA?ÄR62Ä3E -^ ÄÄÄF [Ä </10Ä6? G>/E3 ÄÄÄFEB>ÄG6Ä7P6 /E64:
V COE6ZÄD-G LÄÄ+08ÄL>6ÄB6/2 = ROÄÄJ0<E6Ä62Ä3E T8ÄÄÄJ3E33>0/E3>Ä6E6B2 D\$CÄD3EÄBRF/516

P61 S 7OE:		6 R6 7OE:	V/? 0-G T6>S 75RO:	BC;T 9PÄD+, - ;C M8 D				a2/RJ0FÄ9G	B/ = R6 6?F2FEB>Äb V1 ??007 EB>		J,* 6REJ	- 6= / 2[?
				B/ = R6 D3S	M8 7OE:	T6>\$ -6 FS 79:	N8A V3<>E 32 _^		+0614Ä\$Ä9 M6?EÄ Æ			
!(	(	!	!	!	!	!	!		, 108 52A>Ä01HBCD Ä+89:			
									IS* ; 64K= Ä6>?6Ä23A>Ä - CLP9Ä>4ÄCD @ Ä F6Ä01E			
									Z\$ L62HÄ>?6ÄE6>?6@ÄHBCD @ÄP8ÄZ 161 EÄG 16 1ÄÄÄÄ02<6>EÄE5 6?			
									G21 6ÄÄÄR33>ÄÄÄÄÄ*ÄÄÄÄÄ3<>E 31 622E64			
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*	**	)	!"!!!	!#\$!#	Z'ÄÄ' Ä#Ä%	Z'ÄÄ' Ä#Ä%	Z'ÄÄ' Ä#Ä%					

N3EESÄÄQR82 B3>ÄÄÄ"ÄSÄCÄE

BÄ E09 E3>Ä06?ÄQR268>EÄRR230E/E6
53<>4/ 2Ä56E66>Ä20ÄB6?@ÄE20E2>?Ä=H
56ÄG2/4</SÄVE62Ä161Ä/40>GÄJ1/6Ä566>
= / 46ÄEÄE0?Ä>4Ä<>462Ä6>4E3>?ÄE64S
+ *FE</E3>?Ä30ÄS>4Ä/E62Ä#ÄÄ3F<Ä4<6Ä8E
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE6
= 6/7 <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-307**



BORING LOG

CLIENT: + B&NNA321 >4@9V
PROJECT: T23R3?64ÄLCÄ/V, VÄ>4ÄT 2 0-CA 2 G
LOCATION: W67E/V3= = 62R0 ÄB26E 32E 14@Ä

BORING NO.: **B-308**
SHEET: ÄÄCÄ
PROJECT NO. Ä(' * &#!SÄ
DATE START:)\$Ä) \$ *Ä&
DATE FINISH:)\$Ä) \$ *Ä&

Drilling Information

LOCATION: B66ÄQR82 B>Ä3F/ E>Ä1 > ELEVATION (FT): " &ÄK\$ TOTAL DEPTH (FT): "ZS LOGGED BY: M0 ÄN3HF6
DRILLING CO.: BSÄVSA36ÄRR82/B>?@ÄV DRILLER: V32HÄV<110S DRILLING METHOD: J 31BAÄEÄ ÄC>G2
RIG TYPE: M2FÄ 3<>B4ÄF 62 AUGER ID/OD: ÄÄÄ#Ä0\$ÄÄ 9Ä> SAMPLER: BE >4/24ÄBTEBR33>
HAMMER TYPE: C<E3 / E0ÄC<E3 / E0F HAMMER WEIGHT (lbs): Ä#*ÄÄ** CASING ID/OD: D\$CÄD\$ CORE BARREL: _____
HAMMER EFFICIENCY FACTOR: HAMMER DROP (inch): " ÄÄÄ
WATER LEVEL DEPTHS (ft):)\$Ä\$ *Ä&ÄD3Ä6Ä/E62Ä5?62 64@R62Ä6Ä" Ä K

GENERAL NOTES:

KEY TO NOTES: W/ E2Ä96!! ÄÄBTEÄB33>Ä/ = R6 T6>SÄÄ6>6E2/B0Ä90GEJ W, -ÄÄW6GJEÄÄ-34? B,ÄÄ+08ÄL >6ÄB6/2ÄBE26>GEÄÄ SOES
AND SYMBOLS: V CEÄE6Ä3CÄD-G YÄÄÄÄÄV164ÄM56ÄB = R6 -6F SÄÄ6F31 62Ä6>GÄ W, ÄÄÄV6GJEÄÄ)/= 62 W, ÄÄY>B>064ÄV3=R6??06ÄBE26>GEÄÄ SOES
V CEÄV3= R6B3Ä0 2110> -ÄÄÄF [Ä/32ÄB = R6 5ROÄÄBÄ?ÄR62Ä3E -Ä ÄÄÄF [Ä </10Ä6? G>/E3 ÄÄ-2FE3>ÄG6Ä7PÄ /E64:
V COE62ÄD-G LÄÄ+08ÄL>6ÄB6/2 = ROÄÄ0>E6Ä62Ä3E T8ÄÄÄJ33E3>0EG>Ä 6E6B2 D\$CÄD3EÄBÄF/516

P6I S 7OE:	6 R0 7OE:	V/? 0-G T6>S ÄRO:	BC;T 9PÄD+, - ;C M8 D				a2IRJ0Ä9G	B/ = R6 6?F2FE3>Äb V1 ??0F/ B>	J,* 6REJ	- 6= / 2[?
			B/ = R6 D3S	M8	6 R0 7OE:	T6>S -6 FS 70:				
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N3EE8Ä0ÄRB2 B>ÄEÄZSÄCÄE

BÄE E0Ä E3>Ä06?ÄBR268>EÄRR230E/E6
53<>4/ 2Ä56EÄ6>Ä20ÄB6?@ÄE20B>?Ä=H
56ÄG2/4</SÄVE62Ä161Ä/40>GÄJ/16Ä566>
= / 46ÄEÄE0?Ä>4Ä->462ÄB>4E3>?ÄFE64S
+ÄFE</E3>?Ä30ÄS>4Ä/E62Ä#Ä3F<2Ä<6ÄE
3EJ62ÄCÄ2?ÄJ/>ÄJ3ÄÄR268>EÄEÄEÄE06
= 6/7 <Ä= 6>EÄ62Ä=46S

BORING NO.: **B-308**



BORING LOG

PROJECT / CLIENT: PROPOSED OFFICE BUILDING & PARKING GARAGE / J.B.BROWN & SONS
LOCATION: WEST COMMERCIAL STREET, PORTLAND, ME
DRILLING CO.: S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

BORING NO.: B-101
SHEET: 1 OF 1
PROJECT NO.: 15-0942
DATE START: 9/16/2015
DATE FINISH: 9/16/2015
ELEVATION: 21'
SWC REP.: T.BOYCE

CASING: TYPE H S A SIZE I.D. 2 1/4" HAMMER WT. HAMMER FALL
SAMPLER: D 1 3/8" 140# 30"
CORE BARREL:

WATER LEVEL INFORMATION
GROUNDWATER @ 18'

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	1D	24"	21"	2.0'	4	8	8	5	2'	BROWN SANDY LOAM OVER TAN SILTY SAND WITH GRAVEL OVER BLACK-BROWN SAND & COAL ASH WITH BRICK FRAGMENTS (FILL)
	2D	24"	21"	7.0'	5	5	7	5		TAN FINE SAND TRACE SILT ~ MEDIUM DENSE ~
	3D	24"	24"	12.0'	6	9	11	9	14'	
	4D	24"	15"	17.0'	16	12	16	14	20'	BROWN-GRAY GRAVELLY SAND WITH OCCASIONAL GRAY CLAY SEAMS ~ MEDIUM DENSE ~
	5D	24"	15"	22.0'	7	8	10	10	25'	GRAY GRAVELLY SAND WITH FREQUENT OLIVE-BROWN SANDY SILT SEAMS ~ MEDIUM DENSE ~
	6D	24"	17"	27.0'	6	6	8	13		BROWN SAND, SOME SILT, SOME GRAVEL WITH OCCASIONAL BROWN SILT/CLAY SEAMS ~ MEDIUM DENSE ~
	7D									<< ABANDONED SAMPLE DUE TO 2' BLOW-IN >>
	8D								35'	<< ABANDONED SAMPLE DUE TO 2' BLOW-IN >>
										BOTTOM OF EXPLORATION @ 35'

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☒ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-101



BORING LOG

PROJECT / CLIENT: PROPOSED OFFICE BUILDING & PARKING GARAGE / J.B.BROWN & SONS
LOCATION: WEST COMMERCIAL STREET, PORTLAND, ME
DRILLING CO.: S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

BORING NO.: **B-102**
SHEET: 1 OF 1
PROJECT NO.: 15-0942
DATE START: 9/16/2015
DATE FINISH: 9/16/2015
ELEVATION: 22'
SWC REP.: T.BOYCE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. HAMMER FALL
SAMPLER: D 1 3/8" 140# 30"
CORE BARREL:

WATER LEVEL INFORMATION
DRILLED WET

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
HW									0.4'	GRASS OVER 4" SANDY LOAM
	1D	24"	20"	2.0'	4	7	8	7	2'	LAYERED SAND & GRAVEL WITH COAL ASH (FILL) ~ MEDIUM DENSE ~
	2D	24"	22"	7.0'	4	3	7	5	8'	BROWN SILTY SAND, SOME GRAVEL (FILL) ~ MEDIUM DENSE ~ ROOTLETS @ 7'
	3D	24"	17"	12.0'	3	4	5	6		TAN FINE TO MEDIUM SAND, TRACE SILT ~ LOOSE ~
	4D									<< ABANDONED SAMPLE DUE TO 2' BLOW-IN >>
									20'	
OPEN HOLE	5D	24"	7"	22.0'	7	5	9	9	25'	TAN FINE TO MEDIUM SAND WITH GRAVEL AND OCCASIONAL GRAY CLAY SEAMS ~ MEDIUM DENSE ~
	6D	24"	24"	27.0'	2	3	3	3	29'	OLIVE-BROWN SILTY CLAY $q_p = 1.0$ to 0.0 ksf WITH FREQUENT BROWN & GRAY FINE SAND SEAMS ~ MEDIUM ~
	7D	24"	15"	32.0'	10	16	16	44		TAN SAND, SOME GRAVEL ~ DENSE ~
	8D	24"	5"	37.0'	6	36	23	21	40'	GRAY-BROWN SLTY SAND WITH GRAVEL (BASAL TILL) ~ VERY DENSE ~
										<< ABANDONED SAMPLE DUE TO 3' BLOW-IN >>
	9D									BOTTOM OF EXPLORATION @ 40'

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:



DRILLER - VISUALLY
SOIL TECH. - VISUALLY
LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
AND THE TRANSITION MAY BE GRADUAL.

3

BORING NO.: **B-102**



BORING LOG

BORING NO.: **B-105**
 SHEET: 1 OF 1
 PROJECT NO.: 15-0942
 DATE START: 9/17/2015
 DATE FINISH: 9/17/2015
 ELEVATION: 30'
 SWC REP.: T.BOYCE

PROJECT / CLIENT: PROPOSED OFFICE BUILDING & PARKING GARAGE / J.B.BROWN & SONS
 LOCATION: WEST COMMERCIAL STREET, PORTLAND, ME
 DRILLING CO.: S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

CASING: TYPE H S A SIZE I.D. 2 1/4" HAMMER WT. HAMMER FALL
 SAMPLER: D 1 3/8" 140# 30"
 CORE BARREL:

WATER LEVEL INFORMATION
 GROUNDWATER @ 20.5'

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									0.5'	BROWN SANDY LOAM OVER
	1D	24"	19"	2.0'	3	5	10	14		TAN-OXIDE FINE TO MEDIUM SAND, SOME GRAVEL, TRACE SILT ~ MEDIUM DENSE ~ << BLOWCOUNT OVERSTATED - GRAVEL IN TIP >>
	2D	24"	2"	7.0'	16	26	25	20		
									9'	GRAY SILT AND SAND, SOME GRAVEL ~ LOOSE ~ ~ MEDIUM DENSE ~ ...WITH BROWN LAYERS OF SAND & GRAVEL ~ LOOSE ~
	3D	24"	24"	12.0'	4	4	5	6		
	4D	24"	14"	17.0'	5	6	7	6		
	5D	24"	13"	22.0'	15	16	13	11		
	6D	24"	19"	27.0'	2	3	6	7		

SAMPLES: D = SPLIT SPOON
 C = 2" SHELBY TUBE
 S = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☐ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS:
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

7

BORING NO.: **B-105**

9

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:	1/2" 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

LABORATORY TEST DATA



GRAIN SIZE ANALYSIS - ASTM D6913

PROJECT NAME: Proposed VA Facility
 PROJECT LOCATION: West Commercial Street, Portland, ME
 CLIENT: FD Stonewater
 TECHNICIAN: Erika Stewart, P.E.
 SOIL DESCRIPTION: SAND, some-little Gravel, trace Silt, SP

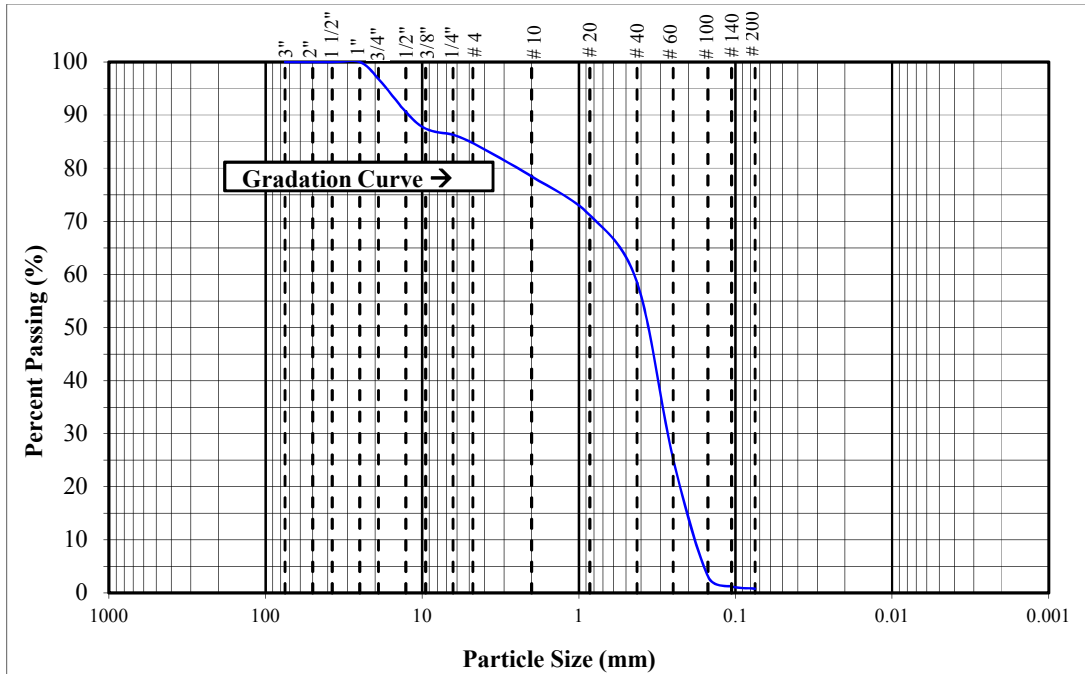
PROJECT #: 19329
 EXPLORATION #: TP-3
 SAMPLE #: S-1
 SAMPLE DEPTH: 4' - 6'
 TEST DATE: 10/7/2019

TEST PROCEDURE

Sample Source: Test Pit	Sieve Stack: Composite	Specimen Procedure: Moist
Test Method: Method A	Separating Sieve(s): 3/8 Inch	Dispersion Type: Tap Water

DATA

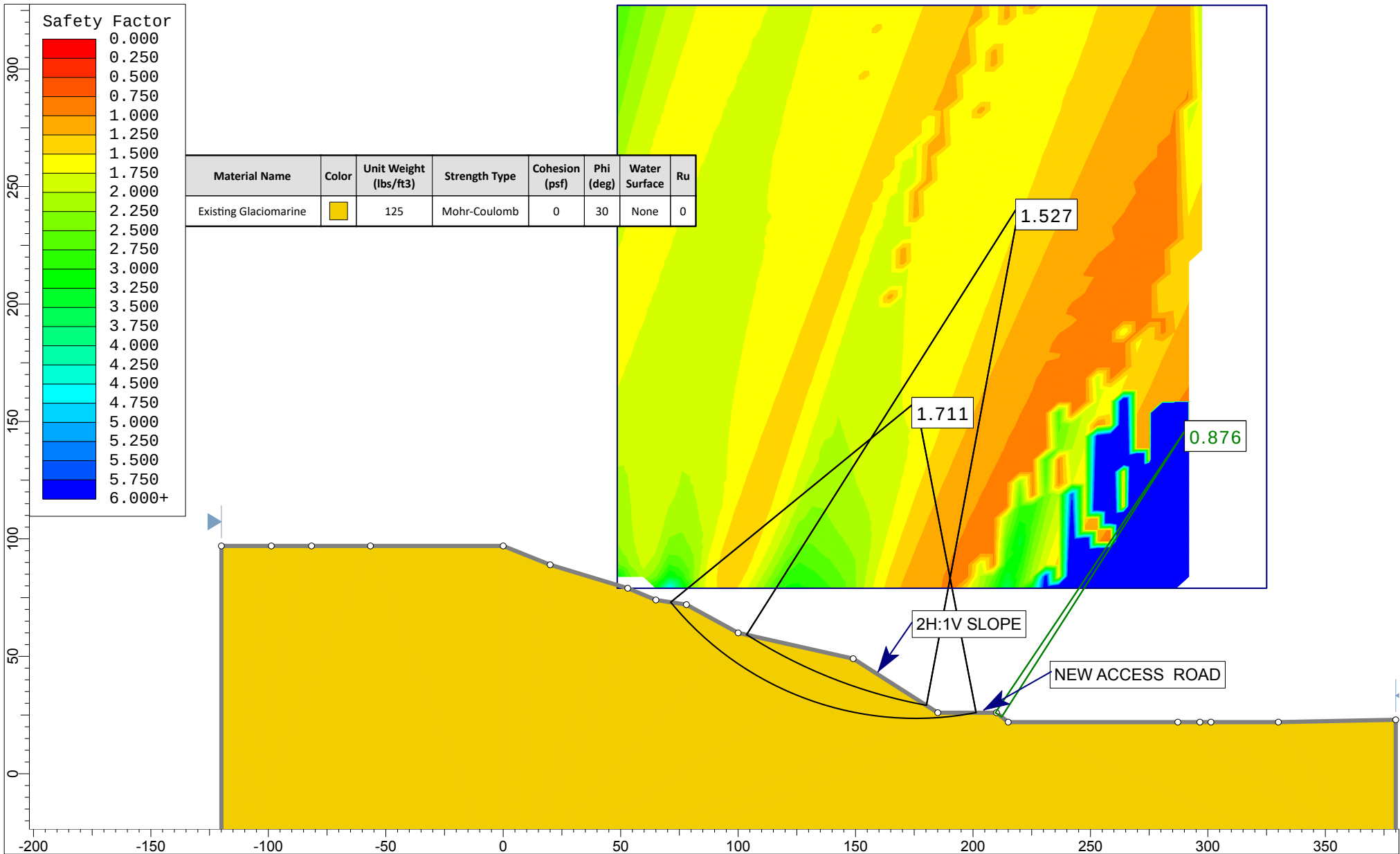
<u>STANDARD SIEVE</u> <u>DESIGNATION (mm)</u>	<u>ALTERNATIVE SIEVE</u> <u>DESIGNATION (in)</u>	<u>PERCENT</u> <u>PASSING (%)</u>
75	(3 in)	100
50	(2 in)	100
37.5	(1-1/2 in)	100
25.0	(1 in)	100
19.0	(3/4 in)	97
12.7	(1/2 in)	91
9.5	(3/8 in)	87
6.35	(1/4 in)	86
4.75	(No. 4)	85
2.00	(No. 10)	78
0.850	(No. 20)	71
0.425	(No. 40)	59
0.250	(No. 60)	25
0.150	(No. 100)	3
0.106	(No. 140)	1
0.075	(No. 200)	1



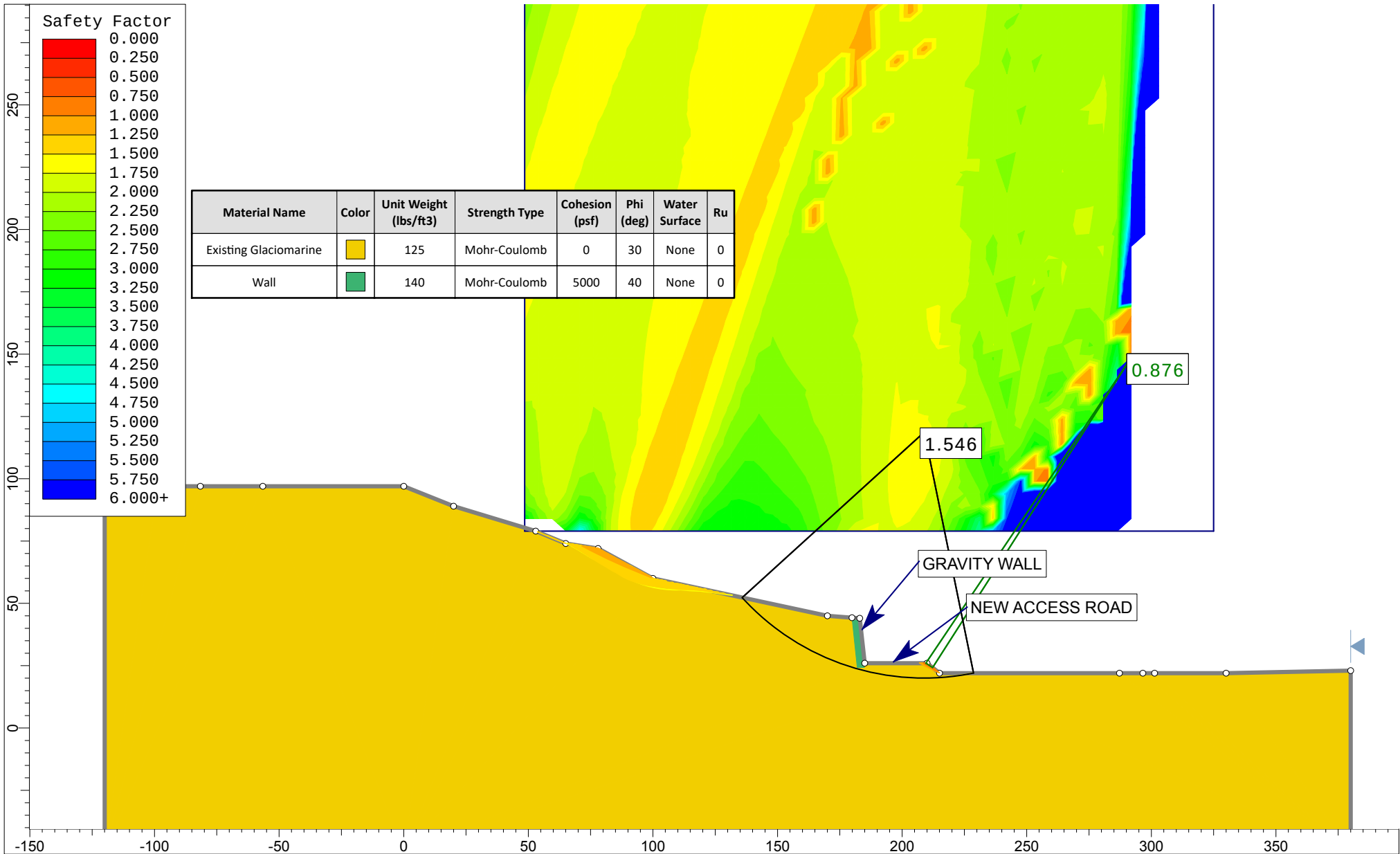
REMARKS: Moisture Content = 2.5%.

APPENDIX E

SLOPE STABILITY ANALYSES RESULTS



Project		West Commercial Street Portland	
EAST SIDE OF PARKING GARAGE - OPEN CUT FACE 2H:1V			
Drawn By		Scale 1:679	Company #19329
Date 11/4/2019		File Name proposed conditions NO SLOPE LIMITS.slmd	



Project

West Commercial Street Portland

EAST SIDE OF PARKING GARAGE - GRAVITY RETAINING WALL

Drawn By

Scale

1:640

Company

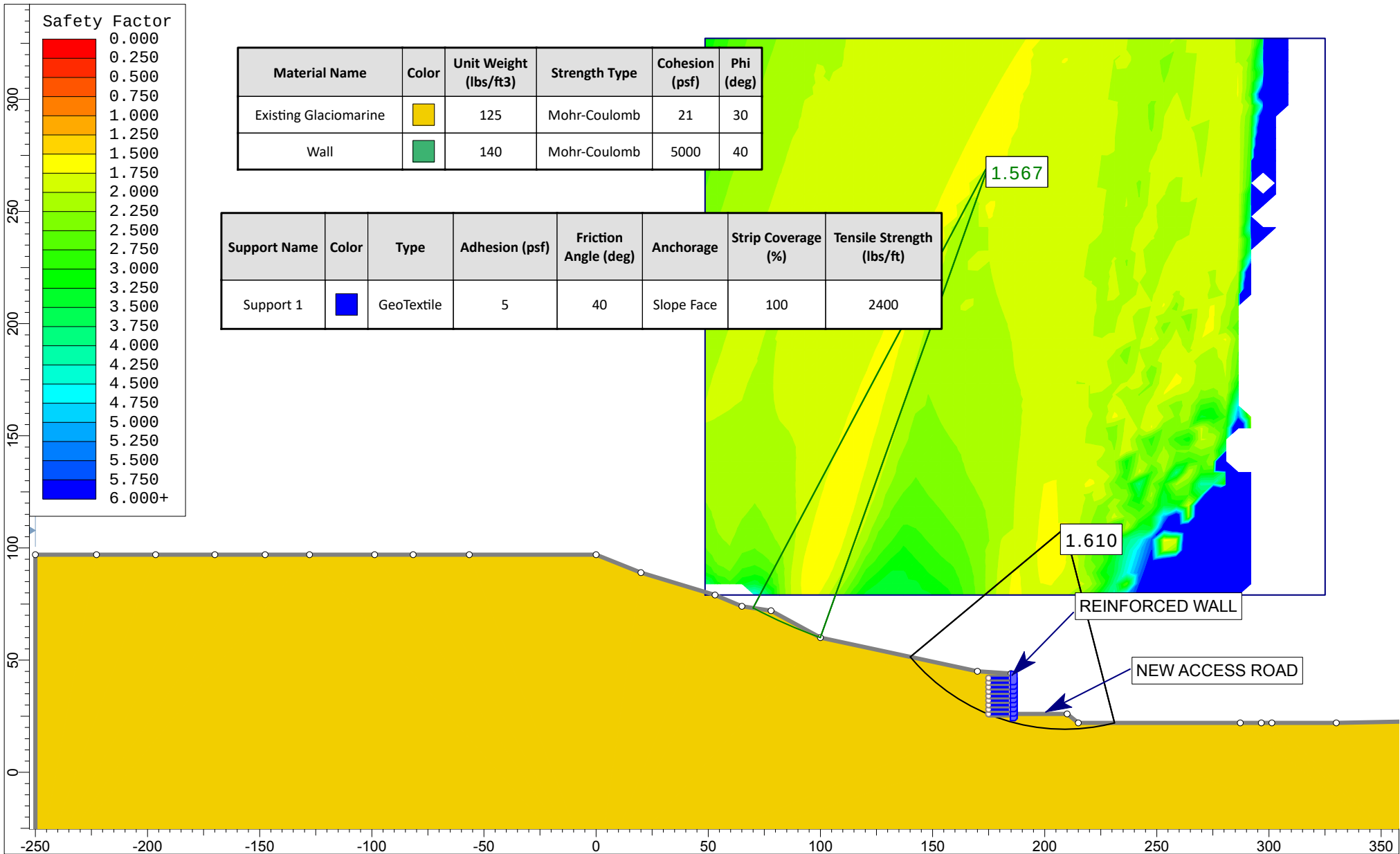
#19329

Date

11/4/2019

File Name

proposed conditions reinforced wall.slmd



Project		West Commercial Street Portland	
EAST SIDE OF PARKING GARAGE - REINFORCED RETAINING WALL			
Drawn By		Scale 1:711	Company #19329
Date 11/4/2019		File Name proposed conditions.slmd	

ATTACHMENT F

Operation & Maintenance Manual

**VA CLINIC
113 WEST COMMERCIAL STREET
PORTLAND, MAINE**

**STORMWATER MANAGEMENT SYSTEM
OPERATION AND MAINTENANCE MANUAL FOR
STORMWATER FACILITIES**

Prepared for

**FDS JBB Portland LLC
10 Fore Street
Portland, Maine 04101**

Prepared by

**Gorrill Palmer
707 Sable Oaks Drive – Suite 30
South Portland, Maine 04106
207.772.2515**

January 2020

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Appendix A – Summary Checklist for Inspection and Maintenance

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I. INTRODUCTION

Runoff from developed areas may contain a number of contaminants especially when emanating from rooftops, paved or lawn areas. This runoff can contain a significant amount of non-point contaminants, which can have an adverse impact on the receiving waters. The installation of wet ponds, many times combined with soil media filters, vegetated buffer strips and other stormwater best management practices can significantly reduce the non-point pollution discharge from the developed area.

The effectiveness of BMP's and other components of the system are dependent on their upkeep and maintenance to assure they meet their design function over an extended period of years. It is critical that the stormwater management facilities are inspected on a regularly scheduled basis, and that maintenance is performed on an as needed basis. It must also be recognized that the effectiveness of these facilities, and their maintenance requirements, are related to the stormwater drainage facilities that transport the flow to the outlets or treatment measures. Thus, maintenance should be directed to the total system, not just the BMP's.

The purpose of this document is to define in detail the inspection and maintenance requirements deemed necessary to assure that the stormwater management facilities function as intended on a long-term basis for the VA Clinic development. This Operations and Maintenance Manual is specific to the proposed stormwater measures utilized to execute a successful stormwater management plan. Subsequent sections identify individual maintenance items; give a brief commentary of the function and need of the item, a description of the work required, and a suggested frequency of accomplishment. While the suggested programs and schedules must be adapted to specific projects, the material presented should provide guidance for a successful long-term program.

A. Guidelines Overview

A summary of the individual components of stormwater management facilities for this project has been prepared. The format used in the summary is as follows:

Preface: A general description of what function/benefit the element is intended to provide. This is a short summary and not intended to provide the design basis, which can be found in other sources.

Inspection: This section provides the inspection requirements for the individual component.

Maintenance: The section provides general information on the routine maintenance requirements of this element.

Frequency: This section outlines the best judgment of the designer on the system to the frequency of maintenance.

Comments: This section provides any particular comment on the site-specific features of this element. This is a summary only. The owner/operator should review the design drawings and documents carefully to understand the particular elements of the project.

The end of this section should allow the owner/operator to make notes on the specific program. This may include the selected maintenance procedure, cross-references to applicable design drawings, etc.

A list of the individual inspection/maintenance elements is provided in the table of contents. The guidelines are proposed for initial use with adjustments made as appropriate based upon specific project experience.

This report includes the Operation and Maintenance requirements for any potential BMP identified in the Stormwater Management Report for this project.

B. Responsible Party

The responsible party for operation and maintenance of the stormwater and other site infrastructure will be the applicant or their agents or assigns. A copy of an unexecuted Stormwater Drainage System Maintenance Agreement is included in Appendix C.

II. PROJECT OVERVIEW

Key permits issued (or applied for) on the project include:

- City of Portland Level III Site Plan Approval
- Maine Construction General Permit Stormwater General Permit

A copy of the permits and Stormwater Management Report should be appended to this manual as Appendix D. The Owner/Operator of the stormwater management system should review these permits for a general description and background of the project, as well as any specific permit conditions or requirements of the project.

The applicant has retained Gorrill Palmer for civil engineering for the development project. Gorrill Palmer has prepared the design for the stormwater management facilities and may be contacted at:

Gorrill Palmer
707 Sable Oaks Drive – Suite 30
South Portland, Maine 04106
207.772.2515

The applicable plans and design documents which apply to the project are:

1. Civil Site Plans Prepared by Gorrill Palmer
2. The Erosion Control/Sedimentation Control Plan for the project
3. The Stormwater Management Plan for the project

A copy of these documents should be retained with this manual.

The proposed design includes inlets, stormwater conveyance lines, porous pavement, a subsurface sand filter, a filter cartridge, and an outlet control structure.

The key receiving waters for this project is the Fore River that is located south of the project site.

The manual is intended for general guidance; however, any substituted deviations from the manual should be reviewed with respect to provisions of Appendix D.

III. STANDARD INSPECTION/MAINTENANCE DESCRIPTIONS

The following narratives describe the inspection/maintenance provisions for the Stormwater Management system. These O&M procedures will complement scheduled vacuuming of the parking spaces which is anticipated to occur at least twice per year. Proper O&M is necessary to make sure the system will provide its intended purpose of conveying runoff, removing a substantial amount of the suspended solids, and other contaminants in the stormwater runoff. Routine vacuuming of the porous areas is critical to their successful functioning.

A. Stormwater Inlets

Preface: The success of any stormwater facility relies on the ability to intercept stormwater runoff at the design locations. Stormwater inlets include catch basins, open culverts, and field inlets. A field inlet exists in the FocalPoint® as an overflow structure. Several catch basins are located at the base of the northern cut slope.

Inspection: The inspection of inlet points will need to be coordinated with other maintenance items, these include:

- Building maintenance areas
- Grounds maintenance

The key elements of the inspection are to assure the inlet entry point is clear of debris and will allow the intended water entry.

Maintenance: The key maintenance is the removal of any blockage which restricts the entry of stormwater to the inlet. The removed material should be taken out of the area of the inlet and placed where it will not reenter the runoff collection system. Snow should be removed from inlets near the sidewalk areas. Grass clippings and leaves should be bagged and removed particularly near the yard inlets near the buildings.

Frequency: All inlets should be inspected on a quarterly basis, and after/during significant storm events i.e. >1" rainfall).

Maintenance Personnel: The maintenance personnel will perform the normal maintenance/inspections of the inlets and tributary drainage system.

Comments: Maintenance of inlets is critical on this project.

B. Tributary Drainage System

Preface: Stormwater from most of the project will be directed through filters and into a conveyance (tributary) system which transports the flow to the main point of discharge after.

This conveyance system will be principally overland flow discharging to piped drain systems. Most of the sediment carried by the drainage system is intended to be trapped in pretreatment devices and structures. Maintenance of this system can play a major role in the long-term maintenance costs and the effectiveness of the onsite systems. The primary pretreatment measure for the VA Clinic site will be through deep sumped catch basins with hooded outlets.

Inspection: The tributary drainage system should be periodically inspected to assure that it is operating as intended, and that the carrying capacity has not been diminished by accumulations of debris and sediment or other hydraulic impediments. On piped systems, the inlets must be inspected to ensure the rims are set at the proper elevation to optimize flow entry and are not clogged with debris.

The level of sediment in the sumps should be checked to assure their effectiveness. Pipelines connecting the inlets should be checked to determine if siltation is occurring. This will be most critical on drain lines laid at minimal slopes. This can usually be accomplished by a light and mirror procedure.

Maintenance: Maintenance of the storm drainage system must assure that it continues to serve its design function on a long-term basis, and that its operation does not transport excessive sediments to any downstream treatment device or the receiving waters. Elevations on the rim of catch basins should be adjusted as needed to assure optimal water entry. Depending on the frost susceptibility of the soil, the rims may become elevated over time causing flow to circumvent the inlet. If a temporary filter bag has been designated for the inlet during construction, silt or other deleterious materials, can significantly reduce capacity and the bags should be removed with the sediment and replaced during construction. Catch basin cleaning would normally be accomplished with vacuum trucks contracted as a maintenance service for the Development. The removed material must be disposed of at an approved site for such materials.

If sediment in the pipeline is observed, it should be removed. This may be accomplished by hydraulic flushing, or by mechanical means. If hydraulic flushing is used the downstream conditions should be analyzed.

Frequency: The tributary drainage system should be inspected on an annual basis. Adjustment of inlet rim elevations should be on an as needed basis. Cleaning catch basin sumps and pipelines will depend on the rate of accumulation.

C. Porous Pavement

Preface: The porous pavement collects stormwater runoff from the surface before passing it through a treatment section and discharging into a closed drainage system.

Inspection/Monitoring: The pavement should be inspected regularly to ensure that the surface is not clogged, and that runoff can pass freely through the porous section. The asphalt surface must be inspected for integrity and to ensure rutting or deformation of the surface is minimized.

Maintenance: Any debris should be removed from the pavement surface. If the porous pavement area is holding water in excess of 48-72 hours, corrective action is needed. To correct a standing water problem, the following remedial actions are recommended.

1. Vacuum any sediment or debris from the pavement surface on a semi-annual basis.
2. Ensure the underdrain system or outlet pipe orifice is not clogged with any silt or other materials.
3. Ensure that the porous pavement can pass water freely or drain quickly while handling large amounts of water.

Frequency: The porous pavement should be inspected and vacuumed semi-annually and maintained as necessary.

Maintenance/Inspection Responsibility: The Owner or an outside agent is responsible for inspection and maintenance of the porous pavement areas

Comments: Proper maintenance is critical for the porous pavement as it plays a large role in the overall stormwater management plan for the development.

D. Subsurface Sand Filter

Preface: The subsurface sand filter is a sand filter layer with storage above underneath a typical section for the applicable surface treatment. Stormwater runoff is conveyed to the filter through a closed pipe system from surface runoff and roof drains.

Inspection: The subsurface sand filter will have control structures and maintenance ports to inspect the pretreatment row and storage layer. Inspect system to see if runoff is draining through the system at the outlet and inlet devices. Visual inspections should also occur after large storm events (i.e. >1").

Maintenance: The procedures for maintenance are as follows:

- **Inlets and Outlets**
Inlets and outlets to the subsurface sand filter should be kept open and in good working condition. This is particularly important for the inlet at the pretreatment rows. Outlets should be cleared and, if necessary flushed of any build-up.
- **Storage Layer**
Remove and dispose of any sediment and build-up in the storage layer.
- **Sedimentation (or Clogging) of Soil Filter Area**
If the sand filter appears to be holding water for a period longer than 48-72 hours, the sand mix has, more than likely, become clogged with sediment and/or the underdrains have clogged. To correct a standing water problem, the following remedial actions are recommended:

1. Evaluate the drainage area to the sand filter area to identify any potential sources of sediment, such as an erosive condition, that may be contributing to the clogging of the device. If a source is identified, it is recommended that that source be eliminated to the fullest extent practicable before proceeding with the remaining recommendations provided below.
2. Flush the underdrains. Use cleanouts to flush the underdrains. Sediment in the drains may be preventing the sand filter from draining. Make sure to provide a way to capture any flushed sediment before it enters the stream environment or storm drain system downstream of the device. If, after flushing the underdrains, the device continues to hold water, the sand filter may be contaminated and need to be replaced.

Frequency: The subsurface sand filter should be inspected semi-annually and maintained as necessary.

Comments: Pretreatment in catch basin sumps and pretreatment row is crucial to long-term function of sand filter.

E. Proprietary Treatment Devices (FocalPoint®)

Preface: A FocalPoint® system will be used on site to treat surface runoff from impervious and landscaped area

Inspection: Inspection of the filter should be performed after each major rainfall event to ensure that stormwater runoff is able to pass through the filters. The vegetation should be inspected and maintained regularly similar to other landscape features on site. The underdrain outlet should be inspected regularly.

Maintenance: Clear inlets and pretreatment devices of debris and sediment. Maintain as instructed by manufacturer.

Frequency: The system should be inspected semi-annually and maintained as required by the manufacturer.

Comments: The manufacturer typically commits to the first year of maintenance if their strict guidelines are followed for installation, which is highly encouraged to achieve peak performance. It is recommended that an outside agent who is familiar with the product be retained for future maintenance.

F. Proprietary Treatment Devices (Filter Cartridge)

Preface: A filter cartridge will be installed in a catch basin in the loading dock well.

Inspection: Inspection of the filters should be performed after each major rainfall event to ensure that stormwater runoff is able to pass through the filters.

Maintenance: Clear the grate of debris. Ensure the filter is passing runoff freely, or at the specified rate. A standard cartridge should last a minimum of one year depending on the cartridge used. Maintain as instructed by manufacturer.

Frequency: The filter should be inspected semi-annually and maintained as required by the manufacturer.

Comments: An outside agent who is familiar with the product should be retained for maintenance of the product.

G. Orifice Control Devices

Preface: Orifices of assorted sizes are commonly utilized to control discharge from stormwater management features. This project uses orifice controls to control discharge from the porous pavement area and the subsurface sand filter.

Inspection: Inspection of orifices should be performed after each major rainfall event to ensure that stormwater runoff is able to discharge through the orifice and that it is not clogged.

Maintenance: The orifice cap should be removed and all debris flushed from the pipe prior to reinstalling the orifice cap. An orifice in a weir wall should be cleared of debris by hand.

Frequency: The orifice control devices should be inspected semi-annually and maintained as needed.

Comments: None.

H. Litter

Litter should be removed as a matter of course by workers and as part of the ground's maintenance contract.

IV. PROGRAM ADMINISTRATION

A. General

A reliable administrative structure must be established to assure implementation of the maintenance programs described in the foregoing section. Key factors that must be considered in establishing a responsive administrative structure include:

1. Administrative body must be responsible for long-term operation and maintenance of the facilities. (Maintenance continues for the lifespan of the development in accordance with this document)
2. Administrative body must have the financial resources to accomplish the inspection and maintenance program over the life of the facility.
3. The administrative body must have a responsible administrator to manage the inspection and maintenance programs.
4. The administrative body must have the staff to accomplish the inspection and maintenance programs or must have authority to contract for the required services.

5. The administrative body must have a management information system sufficient to file, retain, and retrieve all inspection and maintenance records associated with the inspection and maintenance programs.
6. A qualified post construction inspector shall be retained by the Owner. His/her duties shall include preparing schedules for the Owner's maintenance, summarizing the results of this maintenance and preparing an annual report on the operation, maintenance, and repair of the stormwater system which must be copied to the City. (The Owner shall be responsible for retaining a separate entity to perform maintenance which cannot be performed by the management of building and property grounds.) This person shall also participate in troubleshooting of the stormwater management system if a problem develops.

If any of the above criteria cannot be met by the entity assigned inspection and maintenance responsibilities, it is likely that the system will fail to meet its water quality objectives at some point during its life. While each of the above criteria may be met by a variety of formats, it is critical to clearly establish the assigned administrative body in a responsible and sustainable manner.

B. Record Keeping

Records of all inspections and maintenance work accomplished must be kept and maintained to document facility operations. These records should be filed and retained for a minimum 5-year time span. The filing system should be capable of ready retrieval of data for periodic reviews by appropriate regulatory bodies. Where possible, copies of such records should also be filed with the designated primary regulatory agency for their review for compliance with permit conditions. Typical inspection and maintenance record forms are attached hereto as Appendix B.

Beyond the initial 5-year time span of the original approval and maintenance plan, the stormwater management system will need to be recertified through the Department every 5 years to confirm that there is conformance with the original permit documents. This process will ensure all systems function properly over time. This document will remain valid throughout any subsequent recertification processes.

C. Contract Services

In some instances, or at specific times, the Maintenance Personnel may not have the staff to conduct the required inspection and/or maintenance programs as outlined in this document. In such cases, the work should be accomplished on a contractual basis with a firm or organization that has the staff and equipment to accomplish the required work.

The service contract for inspection and maintenance should be formal, well-written legal document which clearly defines the services to be provided, the contractual conditions that will apply, and detailed payment schedules. Liability insurance should be required in all contracts.

APPENDIX A

Summary Checklist Inspection and Maintenance

**Stormwater Management System
Maintenance Program
Summary Checklist**

Item	Commentary	Frequency				
		Monthly	Quarterly	Semi-Annual	Annual	Long Term
Stormwater Inlets	Stormwater inlets allow flow entry from a surface swale to a piped system. Inspect entry for debris accumulation. Remove debris to allow unimpeded entry. Lawn clippings and leaves should be removed from yard areas.		X		X Clearing	
Tributary Drainage System	Inspect to assure that the carrying capacity has not been diminished by debris, sediment or other hydraulic impediments.				X	
Porous Pavement	Inspect after storm events >1" to ensure the pavement is not plugged with debris. Vacuum semi-annually.			X		X
Subsurface Sand Filter	Inspect maintenance ports after rain events >1" and remove sediment. Check for signs of clogging and flush underdrains if necessary.			X		X
Proprietary Device (FocalPoint®)	Filters should be inspected semi-annually and maintained as needed. Snow Storage within the filter should be prohibited by Maintenance Personnel.			X		
Proprietary Device (Filter Cartridge)	Filters should be inspected semi-annually and maintained as needed. Snow Storage within the filter should be prohibited by Maintenance Personnel.			X		
Orifice Control Devices	Inspect after major storm events and clear debris from orifice. May require flushing of pipes.			X		
Litter	Litter should be removed daily.					

APPENDIX B

Sample Inspection Logs

**VA CLINIC
PORTLAND, MAINE**

STORMWATER MANAGEMENT
SAMPLE STORMWATER INSPECTION & MAINTENANCE LOG

This log is intended to accompany the Operation and Maintenance Manual for Stormwater Management and Related Facilities. All stormwater BMPs shall be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions of the DEP Stormwater Permit, shall conduct inspections of the facilities as described in the O&M Manual and on this form, and identified deficiencies must be corrected. This log shall be kept on file for a minimum of five (5) years.

A. General Information			
Project Name:	Inspection Date:		
Parcel/Lot:	Current Weather:		
BMP Owner:	Date/Amount Last Precip.:		
Owner Mailing Address:	Inspection Company:		
Owner Phone #:	Inspection Co. Mailing Address:		
Owner Email:	Inspector Name:		
	Inspector Phone #:		
	Inspector Email:		
B. Stormwater Inlets	Observations		
Frequency: Annually in the spring			
Accumulated sediments from inflow channels and pipes between basins have been removed and legally disposed of	☐ Yes ☐ No ☐ NA		
Floating debris and large sediment particles have been removed from inlets.	☐ Yes ☐ No ☐ NA		
Stormwater Inlet Notes:			
C. Tributary Drainage System	Observations		
Frequency: Annually spring or late fall and after heavy rains			
Remove and legally dispose of sediments	☐ Yes ☐ No ☐ NA		
Remove floatables and other objects	☐ Yes ☐ No ☐ NA		
Check for overgrown vegetation impeding flow	☐ Yes ☐ No ☐ NA		
Check pipelines for siltation and clogging	☐ Yes ☐ No ☐ NA		
Repair any slumping side slopes or erosion	☐ Yes ☐ No ☐ NA		
Replace any riprap on areas where any underlying fabric or underlying gravel is exposed.	☐ Yes ☐ No ☐ NA		
Tributary Drainage System Notes:			

D. Porous Pavement	Observations
Frequency: Semi-Annually	
Vacuum any sediment and debris from pavement surface	☐ Yes ☐ No ☐ NA
Check that underdrain system is functioning properly	☐ Yes ☐ No ☐ NA
Check for pooling or signs that pavement is clogged and doesn't pass water	☐ Yes ☐ No ☐ NA
Porous Pavement Notes:	
E. Subsurface Sand Filter	Observations
Frequency: Semi-annually	
Check that inlets are clear and flow into pretreatment row is not obstructed	☐ Yes ☐ No ☐ NA
Inspect maintenance ports and clear debris or buildup	☐ Yes ☐ No ☐ NA
Check for signs of clogging, or water is not draining within 48-72 hours	☐ Yes ☐ No ☐ NA
Bio-Retention Filters Notes:	
F. Orifice Control Devices	Observations
Frequency: Semi-Annually	
Check for debris blocking orifice	☐ Yes ☐ No ☐ NA
If applicable, flush underdrain pipe	☐ Yes ☐ No ☐ NA
Orifice Control Devices Notes:	
G. Proprietary Device (FocalPoint®)	Observations
Frequency: Semi-Annually	
Check for debris blocking orifice	☐ Yes ☐ No ☐ NA
Check overflow structure and clear debris	☐ Yes ☐ No ☐ NA
Check for signs of clogging, or water is not draining freely through filter media	☐ Yes ☐ No ☐ NA
If applicable, flush underdrain pipe	☐ Yes ☐ No ☐ NA
Proprietary Device Notes:	
H. Proprietary Device (Filter Cartridge)	Observations
Frequency: Semi-Annually	
Check for debris blocking orifice	☐ Yes ☐ No ☐ NA
Check for signs of clogging and that runoff is passing freely or at specified rate	☐ Yes ☐ No ☐ NA
Proprietary Device Notes:	

APPENDIX C

Stormwater Drainage System Maintenance Agreement

STORMWATER DRAINAGE SYSTEM MAINTENANCE AGREEMENT

VA Community Based Outpatient Clinic and Park Garage at 113 West Commercial Street

IN CONSIDERATION OF the site plan approval granted by the Planning Board of the City of Portland to the proposed Community Based Outpatient Clinic and Parking Garage Project ID PL-000927-2019 shown on the Site Layout Plan submitted by Gorrill Palmer Consulting Engineers and associated Grading, & Drainage Plan (Exhibits A and B) prepared by Gorrill Palmer Consulting Engineers of 707 Sable Oaks Drive, South Portland, Maine dated last revised _____ and pursuant to a condition thereof, FDS JBB Portland LLC, a Maine limited liability company with a principal place of business in Portland, Maine, and having a mailing address of c/o FD Stonewater, LLC 1001 19th Street North, Suite 1401, Arlington VA 22209, the owner of the subject premises, does hereby agree, for itself, its successors and assigns (the “Owner”), as follows:

Maintenance Agreement

That it, its successors and assigns, will, at its own cost and expense and at all times in perpetuity, maintain in good repair and in proper working order the porous pavement systems, Subsurface sand filter systems, Roof drains and loading dock drain Filter Cartridge system, Oil-Water Separator and related onsite drainage infrastructure, (hereinafter collectively referred to as the “stormwater system”), as shown on the Grading, & Drainage Plan in Exhibit B and in strict compliance with the approved Stormwater Inspection and Maintenance Manual prepared for the Owner by Gorrill Palmer Consulting Engineers (copy attached in Exhibit C) and Chapter 32 of the Portland City Code.

Owner of the subject premises further agrees, at its own cost, to keep a Stormwater Maintenance Log. Such log shall be made available for inspection by the City of Portland upon reasonable notice and request.

Said agreement is for the benefit of the said City of Portland and all persons in lawful possession of said premises and abutters thereto; further, that the said City of Portland and said persons in lawful possession may enforce this Agreement by an action at law or in equity in any court of competent jurisdiction; further, that after giving the Owner written notice and a stated time to perform, the said City of Portland, by its authorized agents or representatives, may, but is not obligated to, enter upon said premises to maintain, repair, or replace said stormwater system in the event of any failure or neglect thereof, the cost and expense thereof to be reimbursed in full to the said City of Portland by the Owner upon written demand. Any funds owed to the City under this paragraph shall be secured by a lien on the property.

This Agreement shall also not be construed to allow any change or deviation from the requirements of the subdivision and/or site plan most recently and formally approved by the Planning Board of the City of Portland.

This agreement shall bind the undersigned only so long as it retains any interest in said premises, and shall run with the land and be binding upon the Owner’s successors and assigns as their interests may from time to time appear.

The Owner agrees to record a copy of this Agreement in the Cumberland County Registry of Deeds within thirty (30) days of final execution of this Agreement. The Owner further agrees to provide a copy of this Agreement to any successor or assign and to forward to the City an Addendum signed by any successor or assign in which the successor or assign states that the successor or assign has read the Agreement, agrees to all its terms and conditions and the successor or assign will obtain and forward to the City’s Department of Public Services and Department of Planning and Urban Development a similar Addendum from any other successor or assign.

For the purpose of this agreement and release “Owner” is any person or entity who is a successor or assign and has a legal interest in part, or all, of the real estate and any building. The real estate shown by chart, block and lot number in the records on file in the City Assessor’s office shall constitute “the property” that may be entered by the City and lienied if the City is not paid all of its costs and charges following the mailing of a written demand for payment to the owner pursuant to the process and with the same force and effect as that established by 36 M.R.S.A. §§ 942 and 943 for real estate tax liens.

Any written notices or demands required by the agreement shall be complete on the date the notice is attached to one or more doors providing entry to any buildings and mailed by certified mail, return receipt requested or ordinary mail or both to the owner of record as shown on the tax roles on file in the City Assessor’s Office.

If the property has more than one owner on the tax rolls, service shall be complete by mailing it to only the first listed owner. The failure to receive any written notice required by this agreement shall not prevent the City from entering the property and performing maintenance or repairs on the stormwater system, or any component thereof, or liening it or create a cause of action against the City.

Dated at Portland, Maine this ____ day of _____, 2020.

(name of company)

(representative of owner, name and title)

STATE OF MAINE
CUMBERLAND, ss.

Date: _____

Personally appeared the above-named _____(name and title), and acknowledged the foregoing instrument to be his free act and deed in his said capacity.

Before me,

Notary Public/Attorney at Law

Print name: _____

Exhibit A: Approved Site Layout Plan
Exhibit B: Approved Grading & Drainage Plan
Exhibit C: Approved Stormwater Inspection and Maintenance Manual

APPENDIX D

Permits for Project

(To be Added at a Subsequent Time)

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Rev.	Date	Revision

LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB Draft: CBD Date: NOV. 2019
Checked: SRB Scale: AS NOTED Job No.: 3572
File Name: 3572-WHEED-EX.dwg
This plan shall not be modified without written permission from Gorrill Palmer Consulting Engineers, Inc.(GP). Any alterations, authorized or otherwise, shall be at the user's sole risk and without liability to GP.



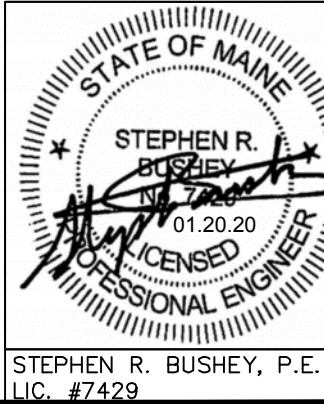
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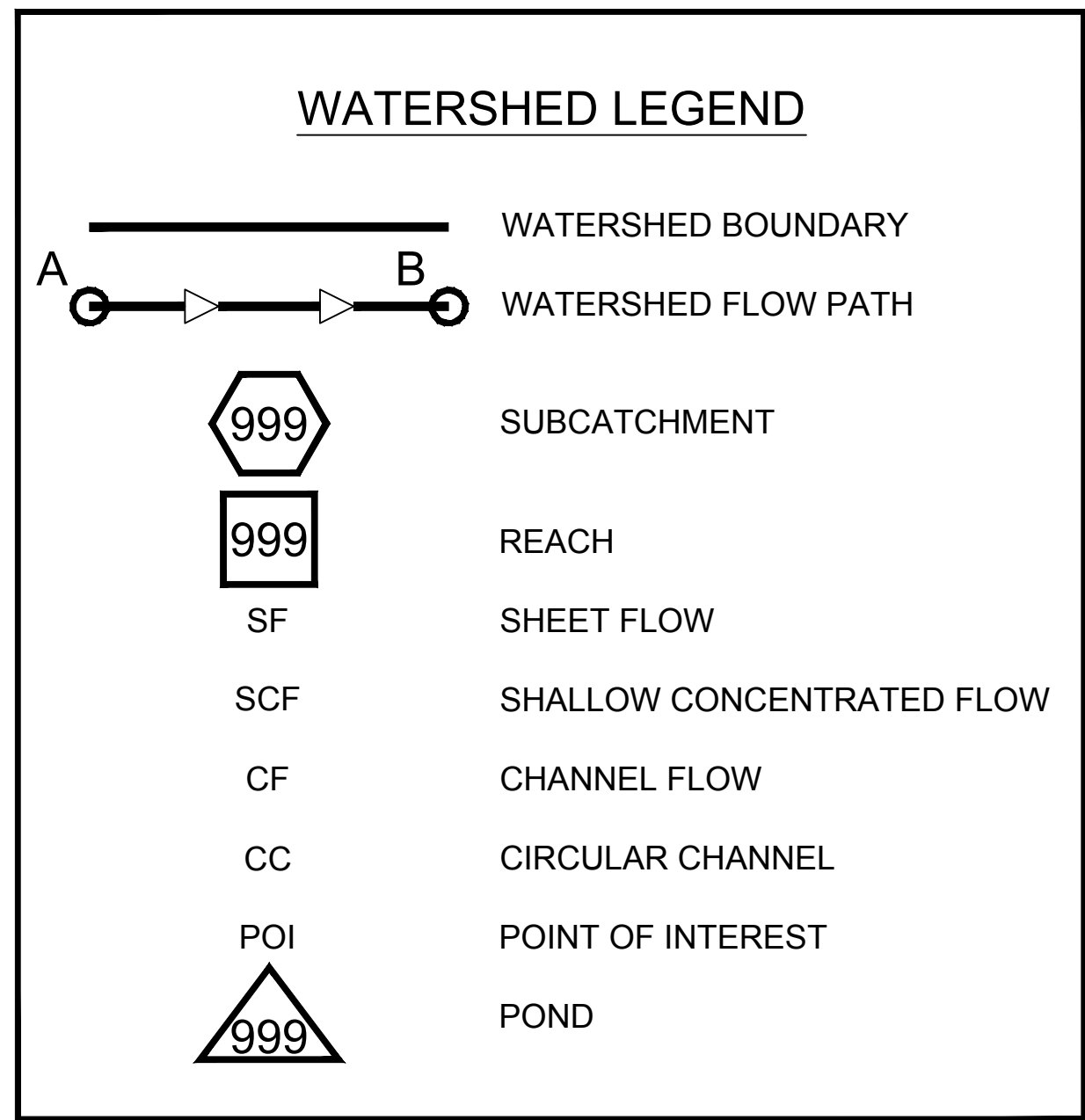
207.772.2515

Drawing Name:	PRE-DEVELOPMENT WATERSHED PLAN
Project:	U.S. Department of Veterans Affairs – Community Based Outpatient Clinic 153 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

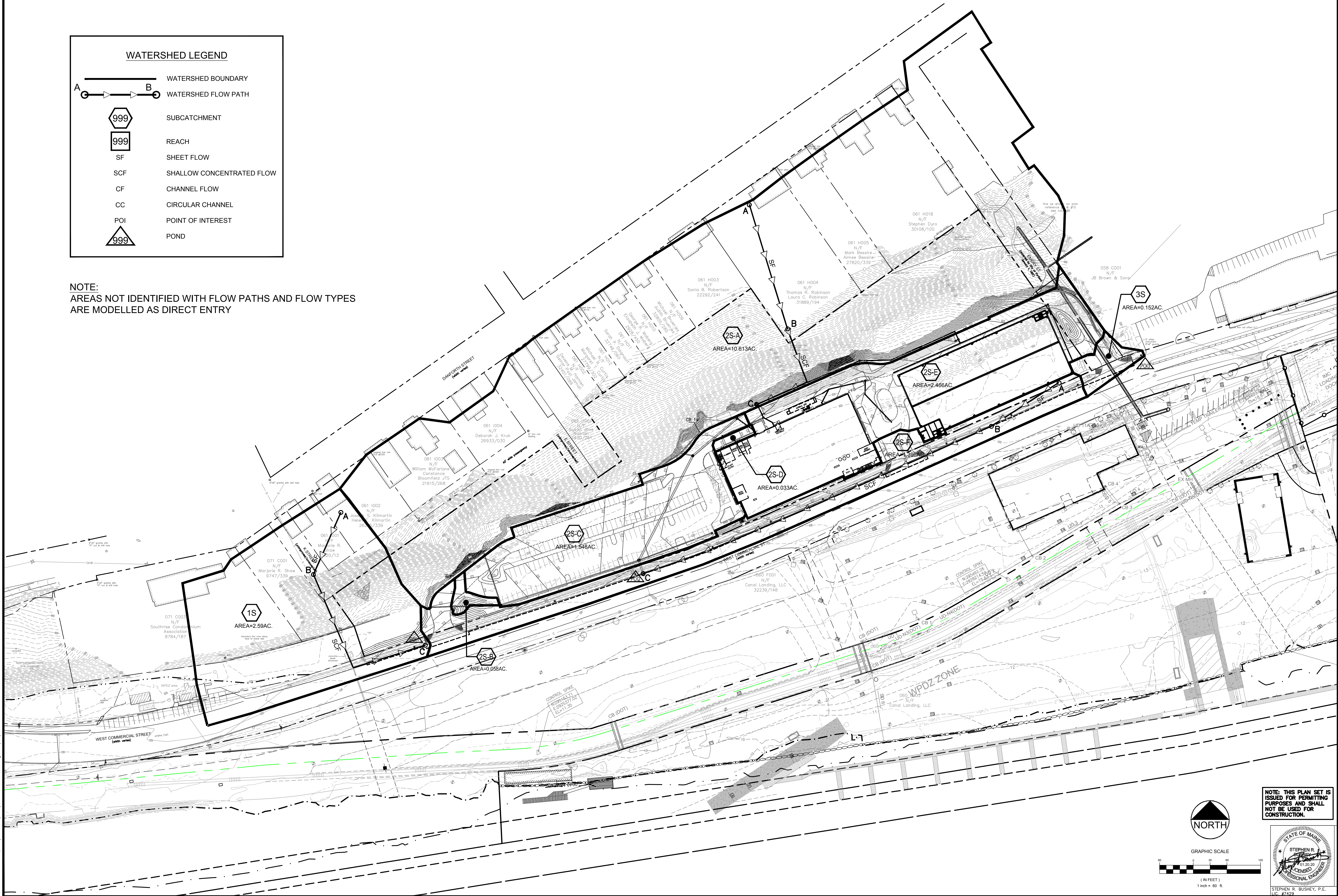
Drawing No.
W-1



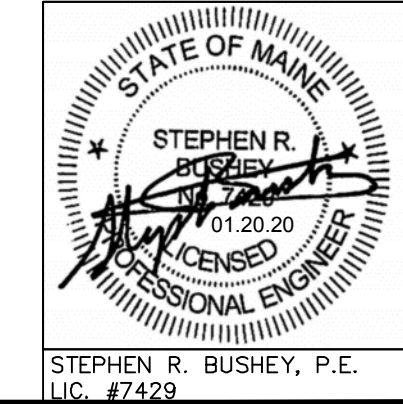
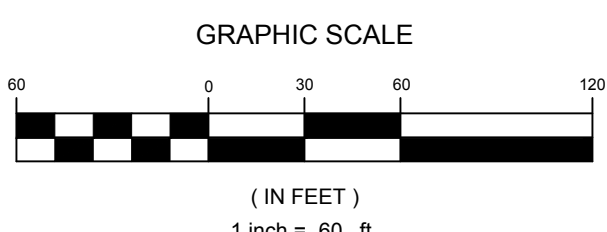
NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.



NOTE:
AREAS NOT IDENTIFIED WITH FLOW PATHS AND FLOW TYPES
ARE MODELLED AS DIRECT ENTRY



NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.



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Rev.	Date	Revision

LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CBD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-WHEED-PRDP.dwg		
This plan shall not be modified without written permission from Gorrell Palmer Consulting Engineers, Inc.(GP). Any alterations, authorized or otherwise, shall be at the user's sole risk and without liability to GP.		



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Drawing No.
W-2

ENVIRONMENTAL AND LANDSCAPE FEATURES

The following statements are provided in accordance with the Section 14-526 of the ordinance.

(b) Environmental Quality Standards

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*

1. Preservation of Significant Natural Features:

- In 2015, Rich Jordan, then of TRC Solutions completed an onsite investigation to identify wetlands or vernal pools that might exist on the site. He did not identify any of these features on the property. A copy of his December 17, 2015 letter outlining this finding accompanies this narrative.

The existing site was historically used as a railyard among other land uses. The site is currently vacant and contains some low-level vegetation and sparse tree coverage within the development area. The steeper slopes at the rear of the property are also covered with ground cover and shrub vegetation. The owner cut larger trees on the slopes several years ago, to discourage transient use and encampments.

- The site does not contain any population of trees or plants that are on the official list of endangered and threatened plans in Maine. Nor does the site contain any habitat for endangered or threatened species, high or moderate value waterfowl and wading bird habitat or significant wetlands or vernal pools.

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*

2. Landscaping and Landscape Prevention:

a. Landscape Preservation.

- (i) The existing tree coverage within the development area is minimal and does not warrant protection in our opinion.
- (ii) Not applicable as the maximum front yard setback is 10'. Existing vegetation on the steeper slopes that will remain undeveloped will be retained.

- (iii) There is no specific vegetation protection required on the site.
- (iv) The Applicant will request a waiver from this standard.
- (v) Not applicable.

Landscaping and Landscape Preservation (14-526 (b) 2 b i)

- a. *Screening and buffering of service areas and between non-residential and residential uses*
- b. *Planting plans with plant schedule and sizes*

2. Landscaping and Landscape Prevention:

b. Site Landscaping:

(i) Landscaped Buffers:

- (a) The Clinic loading dock will be positioned at the rear of the building, and clear of view from the Street. A solid waste collection area will also be located at the rear of the site and it will be screened with a solid enclosure around its perimeter. The transformer pad and an emergency generator will also be located behind the building and thus screened from view of the public along the street. The existing slope and vegetation at the rear of the site will provide suitable screening from residential property along Danforth Street.
- (b) The site development area will contain landscaping of the parking lot and project perimeter. A limited amount of landscaping will be provided along the building front since there is only a narrow space between the building and the street line, based on the maximum building setback provision for the B-5b zone.
- (c) The applicant is requesting a waiver of these provisions due to the site topography. The residential sites to the north (rear) of the property are elevated greater than 50' above the site grades where the development activity will occur. Existing vegetation along the hillside behind the building is expected to provide sufficient screening of the proposed buildings from the residential neighbors.
- (d) Not applicable.

Landscaping and Landscape Preservation (14-526 (b) 2 b ii)

Parking Lot Landscaping, if applicable

- *Landscaped islands within parking areas (Technical Manual, Section 4)*

2. Landscaping and Landscape Preservation:

a. Site Landscaping.

(ii) Parking Lot Landscaping:

- a) thru d) The proposed parking lots will contain landscaping that is consistent with the City's technical standards. This landscaping will maintained in a well-manicured manner.

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*

2. Landscaping and Landscape Preservation:

b. Site Landscaping.

(iii) Street Trees:

- (a) The site landscaping plan contains tree plantings long the front of the property, within the site and not within the Public right of way. The plans include the development of a 5' wide esplanade and the 10' wide pathway within the right of way. Unfortunately, the esplanade is generally located over the existing 115 KVA high voltage underground power transmission line and also below the overhead lines, thus the placement of trees in this zone is basically prohibited because of these conflicts. To offset these restrictions, the plan includes the tree plantings on the site.

TRC
6 Ashley Drive
Scarborough, ME 04074

Main 207-879-1930
Fax 207-879-9293

Memorandum

To: Barry Stowe – Opechee Construction Corporation
11 Corporate Dr | Belmont | NH 03220

From: Rich Jordan - TRC
(rjordan@trcsolutions.com)

Subject: Wetlands Survey – West Commercial Street, Portland, Maine

Date: 2015-Dec-17

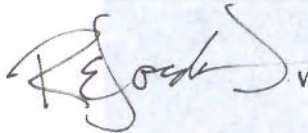
CC: -

Barry –

As requested by your email to me on December 14, this morning I surveyed an area of land located on the north side of the west end of Commercial Street in Portland (indicated in red on Figure 1). The purpose of my visit was to review the site for the presence of wetlands, streams or potential vernal pools. There are none of these features on the property.

I will attach some photographs from my site visit to this memo. Please let me know if you need any additional information. Thanks again!

Respectfully submitted,



Rich Jordan, PWS/CPESC

Cell: 207-317-3583 Office: 207-274-2624
Email: rjordan@trcsolutions.com

ATTACHMENT (1 - photos)



Figure 1. Survey Site on West Commercial Street, Portland.





1. Facing east toward eastern end of subject area.



2. Facing north into subject area.



3. Facing west within subject area.



4. Facing east along Commercial Street by Benny's clam shack.

ENVIRONMENTAL AND STORMWATER

The following statements are provided in accordance with the submission checklist and Section 14-526 of the ordinance.

(b) Environmental Quality Standards

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*

3. Water Quality, Stormwater Management and Erosion Control:

a. Stormwater:

- (i) The development site does not currently contain a defined stormwater management system nor does it lie in a manner that influences offsite drainage patterns from neighboring properties, thus the proposed development is not expected to impede or otherwise cause flooding onto adjacent properties. Generally, the site conditions allow for minor absorption of runoff into the ground based on the site's soils conditions or otherwise stormwater runoff sheets to the street and is captured within catch basins located in the street. The exact conveyance route of the existing street system is unknown and the development team is coordinating with DPW on these existing conditions. The existing 48" Fore River interceptor sewer is located along the site frontage. An existing overflow control structure is located just west of the site and that structure contains a 24" overflow pipe to the Fore River. Similarly, there is a control structure along the Interceptor opposite the Emery Street right of way and that CSO structure regulates flows to multiple overflow pipes out to the Fore River. Each of these CSO systems remains active. The site is proximate to the Fore River tidal conditions and only the Canal Landing Boat Yard is between the site and the river.
- (ii) The site's stormwater runoff will be collected by several means. The proposed clinic building roof will contain drains that will tie into a subsurface chamber storage system and below grade treatment device. These systems will provide both water quality treatment and flood control
- (iii) The development drainage systems will minimize impacts on the volume or rate of stormwater draining offsite. These systems will include runoff storage within the porous pavement sections of the parking lot and within underground proprietary chamber storage for building roof runoff.
- (iv) The existing drainage systems within West Commercial Street are adequately sized to handle the increase in runoff volume and peak discharge.

b. Flooding Standards:

The project will ultimately meet the General Standards under Chapter 500, Stormwater Law (City of Portland Technical Manual, Section 5 – Portland Stormwater Management and MaineDEP Ch. 500, 3 (e)). The Basic Standards will apply to this project and a detailed Soil Erosion and Sediment Control Plan has been developed to address this.

- c. Not applicable, not located within an Urban Impaired Stream.
- d. Not applicable – not a residential development.
- e. Construction at the site will be required to follow Local, State and Federal regulations and will be undertaken under the supervision of a suitably qualified environmental professional. Post-construction activities at the site do not pose a risk of groundwater contamination.
- f. The project will be connected to the public sanitary sewer system which is adequately sized for the anticipated project flows.

Planning and Urban Development Department Planning Division



Subject: B-5 Design Review – 113 West Commercial Street
Written by: Caitlin Cameron, Urban Designer
Date of Review: Tuesday, January 14, 2020

The project at 113 West Commercial Street for the VA facility was reviewed according to the B-5 Design Standards. Reviewers: Caitlin Cameron, Urban Designer, Andrew Tufts, Planner, and Matt Grooms, Senior Planner.

Design Review Comments:

(c) B-5 and B-5b Urban Commercial Business Zones

Standard (1) a. Shared Infrastructure – Met – All phases of this project share infrastructure for parking and traffic circulation. However, three curb cuts/driveways are proposed. Refer to guidance from the peer reviewers regarding the driveways/layout and the potential consolidation of driveways according to this standard and the Technical Manual.

Standard (1) b. Buildings and Uses shall be located close to the street . . . – Met- The buildings on Commercial Street are built close to the property line and continue the street wall established further east on Commercial Street. The building does not have significant active uses but does place office use with windows near the street, slightly set back from the prominent entry area.

Standard (1) c. Buildings shall be oriented toward the street . . . – Met – The main entrances are placed at the corners and engage the street using glazing and canopies to provide emphasis. These are oriented to and directly accessible to the street. The buildings include windows facing towards the street – *these should not be highly tinted or reflective.* There is a landscape buffer between the sidewalk and the buildings. This is built at seating wall height to provide a comfortable interface for pedestrians. Staff question the material choice for this planter wall - what is being proposed? Brick or a material that corresponds to a material found within the building project would be contextual.

Standard (1) d. Parking lots shall be located to the maximum extent practicable toward the rear . . . – Met – Due to site constraints – there is significant grade change to the rear of the property – the surface parking is placed near the street but is located to the maximum extent practicable towards the rear. The majority of the parking is provided in a structure.

Transportation Demand Management (TDM) Plan Mercy Hospital Portland, Maine May 1, 2020

Introduction

Northern Light Health (Mercy Hospital) provides this Transportation Demand Management (TDM) Plan to supplement the application for the proposed consolidation of their State Street facility onto the Fore River Parkway Campus. This TDM Plan applies to the proposed consolidated campus on Fore River Parkway. Each facility is described in more detail as follows:

State Street (Existing)

Size: 242,156 SF

Beds: 63

Employees: 551 (All shifts)

Fore River Parkway (Existing)

Size: 252,072 SF

Beds: 39

Employees: 200 (All shifts)

Consolidated Campus on Fore River Parkway (Proposed)

Size: 339,084 SF

Beds: 71 beds + 6 observation

Employees: Approximately 450-day shift & 200-night shift

TDM is creating and executing a comprehensive strategy around utilizing existing infrastructure in more efficient ways to influence people to use transit, carpools and/or leveraging and expanding existing bike and trail opportunities – all with a goal of reducing single occupancy vehicle trips. Modifying people's behavior to move about in ways other than a car is a fundamental principle of TDM. Northern Light Health is committed to continuing to progress, refine, and expand its TDM plan.



Transportation Context

Site Location:

The Fore River Parkway Campus is ideally located on the peninsula. It is close in proximity to the residential neighborhoods and accessible via the Fore River Parkway Multi-Use Trail, and has METRO service directly to the site. METRO bus route #1 passes through the site, past both the hospital and the medical office building. Additionally, there is an existing METRO stop and shelter on the site, adjacent to the medical office building and is well connected to the existing sidewalk system. These two attributes alone promote walking, bicycling, and transit. Although not expected to be used to a great extent, it is also close in proximity to the Portland Transportation Center with access to the train and Concord Bus service. By being surrounded by direct access to numerous primary corridors such as I-295, it allows access to the site from other areas in the region without requiring vehicles to pass through the more congested downtown.

Campus Consolidation Benefits:

In addition to the benefits that the location of the site provides, there are significant positive impacts to traffic and transportation as a result of the consolidation of the State Street facility onto the Fore River Parkway campus. Those positive impacts are as follows:

- **Shuttle Use** – Currently employees for the State Street facility park at the Fore River Parkway Campus and take a shuttle to the State Street facility. There are two shuttles that run continuously between the two facilities 5 days per week at 14 hours per day. Mercy estimates this is approximately 107,400 miles annually. With the proposed consolidation, the shuttles will no longer be needed, thus reducing congestion in the downtown area, reducing air pollution, and reducing the wear and tear on City infrastructure.
- **More Downtown Parking Available** – With the consolidation of the two facilities, those employees that chose to park near the State Street facility instead of using the shuttle, as well as visitors who chose to park on the street, will no longer be traveling and parking in the downtown area. This results in less traffic and more available parking in a highly desirable area for parking.
- **Less EMS** – In the first 10 months of 2019, Mercy received 4,500 EMS arrivals to the emergency department at State Street. With the consolidation, this traffic will no longer be destined for in the more congested part of the downtown. As identified previously, this benefit is even further enhanced by the close proximity of the site to major arterials such as I-295.
- **Larger Pool of employees** – By consolidating the two campuses, the employee pool will also be consolidated. This will provide a larger group of employees which will increase the opportunities for other benefits such as carpooling.



TDM Coordinator

The TDM coordinator for Mercy is the Director of Security and is charged with administering and coordinating the TDM Plan. Being an employee themselves, allows more direct access to the other employees and the general working environment. This also allows more opportunity for the coordinator to discuss and promote TDM opportunities and benefits with the employees.

The TDM Coordinator will be responsible for the following items:

- Coordinate and promote rideshare opportunities and incentives.
- Coordinate and promote the use of the following alternatives to single occupant vehicle travel:
 - Providing METRO information and advancing incentives to increase ridership
 - Providing Car Share service information
- Monitoring bike rack usage and making recommendations as needed to accommodate demand.
- Encouraging greater use of bicycling and walking through education and promotion of available amenities and infrastructure in the area, as well as available incentives.
- Overseeing ongoing monitoring and updating of this TDM plan on a yearly basis.
- Administering and reviewing TDM surveys on a yearly basis.
- Filing annual TDM reports with the City and working with them on strategies for improvement.

Trip and Parking Reduction Targets

A hospital by itself is challenging from a TDM perspective. There are primarily two contributors to the traffic volumes: visitors and employees / staff. Given the type of facility, a realistic target is not expected to be more than 5%, which is equivalent to 12 trip ends during the AM peak hour and 12 trip ends during the PM peak hour. The timeline for achieving this goal is 2-3 years after full consolidation (expected in January 2022). Once the campus is consolidated and during each annual review period, the reduction targets will be reassessed to ensure that targets and mode reduction assumptions made in the TMP are reasonable, and if not, modifications to this TDM plan will be required.

Trip and Parking Reduction Strategies

The proposed trip and parking reduction strategies have been divided into three categories: infrastructure, incentives, and information. The following summarizes the proposed strategies for each category.



Infrastructure Strategies

Infrastructure strategies primarily include modifications and improvements to the accessibility of modes of transportation other than single occupant vehicles. The following summarizes the proposed infrastructure strategies for the site.

Public Transit Access

METRO currently services the site directly. This is expected to continue after consolidation. Mercy maintains contact and communications with METRO and will continue after consolidation. To promote transit use, Mercy is engaged with METRO to develop a program that would provide discounted METRO bus fare for employees.

Pedestrian and Bicycle Access

As identified previously, the Fore River Parkway Trail runs along the site frontage. Access to the site from the shared use pathway serving bicyclists and pedestrians is via two crosswalks, one at each of the primary accesses to the site. One is at a signalized intersection and the other is located at an unsignalized intersection. To enhance the safety of the unsignalized crossing, Mercy is planning to install two new pedestrian actuated Rectangular Rapid Flashing Beacons (RRFBs), one on each side of the crosswalk. From the pathway, one can walk to Congress Street to the north and to Commercial Street to the south. The TDM Coordinator will work to promote this path and the on-site bicycle racks to increase the number of bicyclists. It is recommended that bicycle parking be provided in key locations around the site and monitored by the TDM Coordinator, who will identify if additional bicycle parking is warranted. The existing 18 bicycle spaces are planned to be increased to 58 spaces. Shower and locker facilities are also provided to encourage bicycle use. If sufficient demand, Mercy will consider a bicycle share program to encourage employees who do not own bicycles to use them as an alternative mode of transportation.

Incentives

Incentives can be used to encourage employees and visitors to reduce trip generation and parking demand. These incentives are different depending on the specific use and need to cater to the various needs and desires of contributing users to the site. In this specific case, the users include the employees / staff and visitors. The TDM Coordinator is responsible for aiding in developing suitable incentives.



Employee Incentives

Employer incentives to actively encourage use of alternative modes of transportation through employee orientation, on-going communications, and intranet reminders include:

- Providing discounted bus passes for METRO, which currently has a bus stop on-site
- Designate preferential parking for ride shares of two or more persons
- Implement a ride share registry to match employees interested in ride share
- Promote bicycle use with the availability of bike racks and staff showers and lockers. The number of bike racks on the Fore River Parkway Campus will be increased from 18 spaces to 58 spaces
- Development of internal marketing program offering ideas, rewards and prizes for those using alternative modes of transportation

Mercy commits to tasking the TDM Coordinator with educating employees about the incentives listed above and helping them facilitate participation in these programs and benefits. The TDM Coordinator will conduct education and outreach to employees four times a year and discuss the efficacy of the incentives which will be documented and summarized in an annual TDM report for the overall site. The annual report will provide suggested follow up action items and modifications.

Visitor Incentives

Visitor incentives are more challenging for a hospital and does not lend itself to conventional visitor incentives. Mercy intends to provide information on their website that describes the potential options for visitors such as transit, bicycling and walking. We would expect the incentives for visitors to be improved once the site is consolidated and receipt of the first few visitor surveys are processed. See also the next section.

Information & Marketing

A bulletin board within the lobby or at the receptionist's desk will post transit resources, rideshare opportunities, bicycle and pedestrian information, and any promotions that are beneficial to promoting vehicle trip reduction. The TDM Coordinator will promote and educate on the following:

- Provide information and resources which will include employee commute incentive suggestions, where transit resources are posted on the site and other relevant information. The information may be provided on intranet and include alternate commute options, METRO information, and walking / biking resources.
- Encourage rideshare groups, lists and use intranet to inform employees about carpooling options.



- Create and market ride sharing connections and matching programs for employees, visitors and residents to use at their own purview.
- TDM Coordinator will coordinate with METRO, Portland Trails, Bicycle Coalition, and others.
- Issuing semi-annual newsletters to employees about TDM strategies.
- Communicating with other TDM Coordinators in the area about TDM measures and what is working or not working for them including participation in a Transportation Management Association, if one is formed.

Monitoring and Reporting Plan

As part of the TDM Plan monitoring program, the TDM Coordinator will be responsible for overseeing the assessment of the TDM Plan use of its various operational components. The monitoring will be through surveys, direct observation, and interaction with employees/staff and visitors. The following summarizes the components of the monitoring and reporting plan.

Employee Surveys

Six months after consolidation and annually thereafter, the employees will be surveyed regarding their transportation choices such as automobile / bicycle / motorcycle-scooter ownership, parking demand, and the frequency of trips using bicycling, walking, Car Share, carpool/vanpool, drive alone, and the bus. The survey will be updated periodically by the TDM Coordinator. The surveys will be conducted to determine:

- Mode of travel to and from work (car/carpool/biking/walking/bus)
- Preferences or barriers to use of the modes of travel
- The flexibility and receptivity of employees to utilizing various travel modes (and to ascertain whether individual employees make use of multiple modes during the course of a given year or season)

Various questions will be created in the survey to determine which measures to encourage increased use of transit, walking, cycling, and carpooling are most effective.

Visitor Surveys

For visitors to the site, surveys will also be conducted to gather the following information:

- Mode of travel to and from the hospital (car / biking/ walking / bus)
- Preferences or concerns with modes of travel
- Barriers to using alternative modes of transportation
- The flexibility and receptivity of visitors to utilizing various travel modes to access the site



All visitor surveys will need to be simple and convenient. Various questions will be created in the survey to determine measures to encourage increased use of transit. The TDM Coordinator will work with Mercy to determine what kinds of incentives elicit consistent and engaged participation in these surveys. The TDM Coordinator will document, track and summarize the information collected from visitor surveys in the annual report.

Traffic Volume Monitoring

The applicant shall conduct a traffic monitoring study at six months post-occupancy and again at 12 months post-occupancy of the consolidated campus. The study shall provide documentation on: traffic volumes entering and exiting the site during the weekday AM and PM peak hours of adjacent street traffic at both entrances and observations of pedestrian movements along the frontage of the site. A scope of work for the monitoring study shall be provided to the City prior to initiation of the study.

Reporting

The TDM Plan will be updated on an annual basis and submitted to the City's TDM Manager for review along with an annual summary report. The report will include information from the employee and visitor surveys such as:

- Number of people walking to the site
- Number of people bicycling to the site
- Number of people using transit
- Carpooling usage
- Parking utilization
- Bicycle parking data from periodic field reviews
- Summary of how we are meeting TDM reduction targets
- Estimated mode split usage

The TDM Coordinator will need to discuss future options for additional TDM strategies as they become available with the City.

TAX MAP-BLOCK-LOT NUMBER:

060 A001001

CURRENT LAND OWNER:

J.B. BROWN & SONS
10 FREE STREET
PORTLAND, ME 04101
CONTACT: VIN VERONEAU - PRESIDENT / CEO
207.553.6633
veroneau@jbbrown.com
CCRD BOOK 29147, PAGE 254

DEVELOPER / APPLICANT:

FDS JBB PORTLAND, LLC
c/o FD STONEWATER, LLC
1001 19th STREET NORTH, SUITE 1401
ARLINGTON, VA. 22209
CONTACT: CLAIBORNE WILLIAMS - MEMBER
213.600.4326
cwilliams@fdstonewater.com

SITE DEVELOPMENT PLANS

FOR

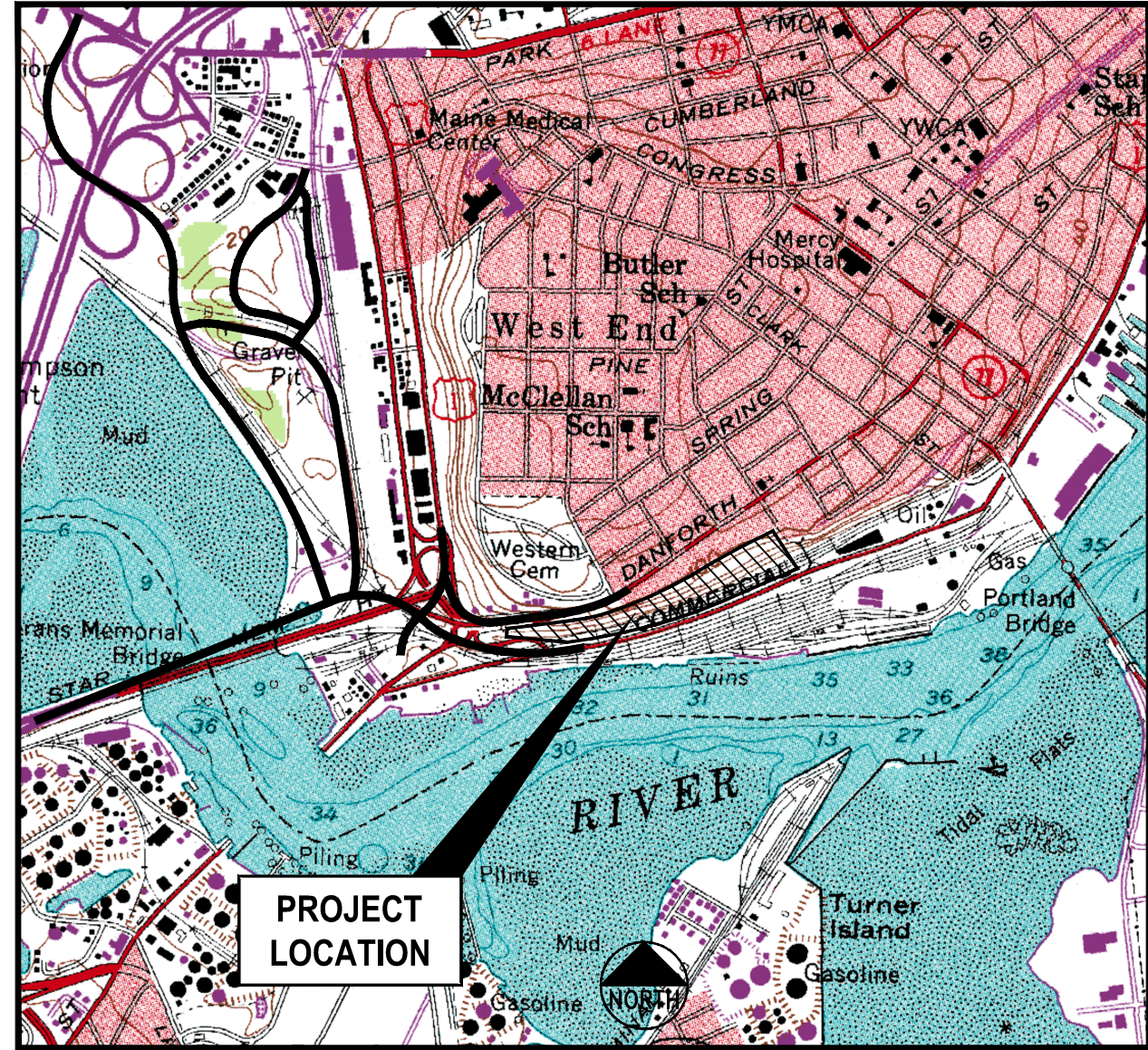
U.S. Department of Veterans Affairs

Community Based Outpatient Clinic

141 WEST COMMERCIAL ST., PORTLAND, MAINE

MAY 2020

CONSTRUCTION DOCUMENTS / PERMIT APPROVAL



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Stephen R. Bushey

I HEREBY ACKNOWLEDGE THAT THESE PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MAINE AND THAT I AM COMPETENT TO PREPARE THIS DOCUMENT.

UTILITIES

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225 DOUGLASS STREET
P.O. BOX 3553
PORTLAND, MAINE 04104
207.761.8310
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rbartels@pwd.org

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212 CANCO ROAD
PORTLAND, MAINE 04103
207.874.8840
CONTACT: KEITH GRAY / BRAD ROLAND

ELECTRIC:
CENTRAL MAINE POWER
162 CANCO ROAD
PORTLAND, MAINE 04103
207.842.2367
CONTACT: JAMIE COUGH

TELEPHONE:
CONSOLIDATED COMMUNICATIONS
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PORTLAND, MAINE 04103
207.797.1866
CONTACT: PATRICK MORRISON

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NORTHERN UTILITIES / UNITIL
1075 FOREST AVENUE
PORTLAND, MAINE 04103
207.797.8002, EXT. 6220
CONTACT: CRAIG CAMPBELL / SCOTT CARPENTER
207.650.6716

CABLE TV:
TIME WARNER CABLE / SPECTRUM
115 JOHNSON ROAD
PORTLAND, MAINE 04102
207.253.2324
CONTACT: MARK PELLETIER

DIG SAFE:
CALL BEFORE YOU DIG
DIAL 811 (AT LEAST 72 HRS IN ADVANCE)

PERMITS / APPROVALS

TYPE:

LOCAL

SITE PLAN PERMIT:

GOVERNING BODY:

CITY OF PORTLAND PLANNING AUTHORITY
CITY HALL, CONGRESS STREET
PORTLAND, MAINE 04103
207.874.8608
CONTACT: ANDREW TUFTS

STATUS/DATE ISSUED:

LEVEL III SITE PLAN APPLICATION - SUBMITTED 12/06/19

BUILDING PERMIT:

CITY OF PORTLAND CODE ENFORCEMENT OFFICE
CITY HALL, CONGRESS STREET
PORTLAND, MAINE 04103
207.874.8900

TO BE DETERMINED

UTILITY OPENING PERMITS:

CITY OF PORTLAND PUBLIC SERVICES DIVISION
212 CANCO ROAD
PORTLAND, ME 04103

TO BE DETERMINED

STATE

MAINE DOT TRAFFIC PERMIT:

MAINE DEPARTMENT OF TRANSPORTATION
SOUTHERN REGION (REGION 1)
51 PLEASANT HILL ROAD
SCARBOROUGH, MAINE 04074
207.885.7000

DELEGATED AUTHORITY TO CITY OF PORTLAND
SCOPING MEETING PLANNED FOR DECEMBER
SUBMITTED DECEMBER 2019

MAINE VOLUNTARY RESPONSE
ACTION PLAN (VRAP):

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF REMEDIATION AND WASTE MANAGEMENT
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
ATTN: NICHOLAS HODGKINS
207.623.8367

-

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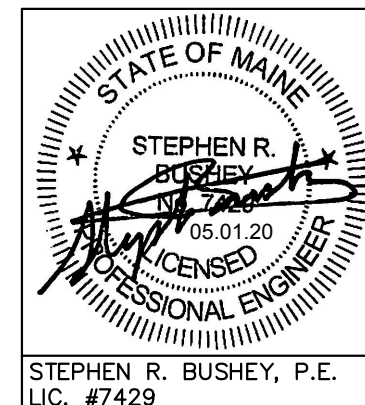
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NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.



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Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

Released To	Date	By
RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-COVER.dwg		
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Drawing Name:	COVER SHEET
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-1.0
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GENERAL NOTES:

1. THE CONTRACTOR SHALL REFER TO THE PROJECT MANUAL FOR CONSTRUCTION SPECIFICATIONS AND BIDDING PROCEDURES.

2. THIS PROJECT WILL BE SUBJECT TO THE TERMS AND CONDITIONS OF ALL PERMITS ISSUED BY LOCAL UTILITY COMPANIES AND THE CITY OF PORTLAND.

3. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF THE ENTRANCE, PAVING, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY ENTRANCE POINTS. ENTRANCES IN MOST LOCATIONS REQUIRE STRUCTURAL SLABS. REFER TO THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR INFORMATION ON THE STRUCTURAL SLAB ENTRANCES.

4. ALL REQUIRED AND NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSIONS AND THE FINAL SERVICE CONNECTIONS.

5. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR THE ELEVATION OF THE EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AND DIG SAFE AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

6. MAINTENANCE OF EROSION CONTROL MEASURES IS OF PARAMOUNT IMPORTANCE TO THE APPLICANT. AND THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL EROSION CONTROL MEASURES SHOWN ON THE PLANS. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED IF DEEMED NECESSARY BY ONSITE INSPECTIONS OF THE OWNER, THEIR REPRESENTATIVES, OR THE CITY, AT NO ADDITIONAL COST TO THE OWNER.

7. ALL MATERIAL SCHEDULES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL PREPARE HIS OWN MATERIAL SCHEDULES BASED UPON HIS PLAN REVIEW. ALL SCHEDULES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS OR PERFORMING WORK.

8. ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE PROJECT SPECIFICATIONS, THE CITY OF PORTLAND AND SERVICING UTILITY REQUIREMENTS, IN CASES WHERE THESE CONFLICT THE MOST STRINGENT SHALL APPLY AT NO EXTRA COST TO THE OWNER.

9. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RECORD DRAWINGS THROUGHOUT THE PROJECT AND PROVIDING THE OWNER WITH A SET OF THE FINAL RECORD DRAWINGS WHEN THE PROJECT IS COMPLETE.

10. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ACCESS AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY MARKINGS, SIGNAGE AND INCIDENTALS TO MAINTAIN SAFE VEHICLE AND PEDESTRIAN ACCESS THROUGH OUT THE LIFE OF THE PROJECT.
9. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.

10. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE AND EXIT RAMPS ADJACENT TO THE BUILDING AND ALONG NEW CURBED AREAS. ALL ADA COMPLIANT PARKING SPACES SHALL BE PAVED WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.

11. PROVIDE STABILIZATION OR SEPARATION GEOTEXTILE FABRIC OVER WETLAND AREAS TO BE FILLED OR OVER UNSTABLE SOILS AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND IN ACCORDANCE WITH THE FINAL GEOTECHNICAL RECOMMENDATIONS.

12. NATIVE SOILS RANGE FROM GRANULAR TO CLAYEY AND SILTY. CARE MUST BE EXERCISED TO LIMIT DISTURBANCE OF THE BEARING SOILS. THE NATIVE CLAYEY OR SILTY SOILS SHOULD NOT BE PROOF-ROLLED. SHOULD THE SUBGRADE BECOME YIELDING OR DIFFICULT TO WORK, DISTURBED AREAS SHOULD BE EXCAVATED AND BACKFILLED WITH COMPACTED SELECT FILL OR CRUSHED STONE AT NO EXTRA EXPENSE TO THE OWNER.

13. FIVE (5.0) FEET OF CLEAN GRANULAR SOIL MEETING THE SELECT FILL GRADATION SPECIFICATIONS SHALL BE PROVIDED BELOW THE ENTRANCE SLABS AND ADJACENT SIDEWALKS. GRADUAL TRANSITION (3 HORIZONTAL TO 1 VERTICAL) OF SELECT FILL THICKNESS SHALL BE PROVIDED FROM THE 5.0 FOOT DEPTH TO THE GRAVEL BASE THICKNESS AT THE SIDEWALKS AND PAVED AREAS AWAY FROM THE BUILDINGS.

LOCAL APPROVALS, WAIVERS, AND VARIANCES:
(ADDITIONAL INFORMATION TO BE PROVIDED UPON RECEIPT OF APPROVALS)

THE CONSTRUCTION PLANS ARE TO BE SUBMITTED TO THE CITY OF PORTLAND FOR THEIR REVIEW AND APPROVAL.

UTILITY NOTES:

1. ALL REQUIRED UTILITIES SERVING THE PROJECT SHALL BE COORDINATED AND CONSTRUCTED BY THE SITE WORK CONTRACTOR TO WITHIN 5 FEET OF THE BUILDINGS, AT A LOCATION COORDINATED WITH THE MEP CONTRACTOR AND THE BUILDING PLANS. SITE WORK WITHIN 5 FEET OF UNDERSLAB UTILITIES SHALL CONSIST OF TRENCHING AND BACKFILLING. ACTUAL UTILITY INSTALLATION SHALL BE BY THE MEP CONTRACTOR. ALL REQUIRED CONNECTION FEES SHALL BE PAID BY THE GENERAL CONTRACTOR.

2. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF AND/OR RELOCATION OF OVERHEAD AND UNDERGROUND TELEPHONE WITH CONSOLIDATED COMMUNICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUITS, PULL WIRES, TRENCHING AND BACKFILLING NECESSARY TO COMPLETE THE WORK.

3. ALL SANITARY SEWER WORK SHALL MEET THE STANDARDS OF THE MAINE STATE PLUMBING CODE AND CITY OF PORTLAND PUBLIC WORKS DEPARTMENT.

4. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRIC SERVICE WITH CENTRAL MAINE POWER.

5. COORDINATE ALL UTILITY WORK WITH THE APPROPRIATE UTILITY COMPANY. ALL UTILITY WORK SHALL CONFORM TO THE STANDARDS OF THE UTILITY COMPANY AND PROJECT SPECIFICATIONS.

6. THE LOCATIONS OF THE NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE SERVING UTILITY COMPANY.

7. UNDERGROUND ELECTRICAL, CONDUIT MATERIAL AND INSTALLATION SHALL CONFORM TO UTILITY COMPANY STANDARDS AND PROJECT SPECIFICATIONS, WHICH EVER IS MORE STRINGENT.

8. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.

9. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.

10. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO COMPLETION OF THE PROJECT.

11. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL, AT NO EXTRA EXPENSE TO THE OWNER.

12. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18 INCH OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER AND SANITARY SEWER CROSSINGS.

13. THE CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION AND PROVIDE TEMPORARY SERVICES AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO THE JOBSITE. TEMPORARY SERVICES SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. COORDINATE ALL TEMPORARY SERVICES WITH UTILITY COMPANY, OWNER AND AFFECTED BUSINESSES.

LANDSCAPE NOTES:

(SUBJECT TO COORDINATION WITH LANDSCAPE DRAWINGS. IN CASE OF CONFLICT, THE LANDSCAPING DRAWINGS SHALL GOVERN.)

1. ALL PLANTS SHALL BE NURSERY GROWN AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN, STANDARDS AND SHALL BE SUBJECT TO THE APPROVAL OF THE OWNERS REPRESENTATIVE BEFORE AND AFTER PLANTING.

2. PLANTS SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER INSPECTION AND ACCEPTANCE, AND SHALL HAVE AT LEAST 80% HEALTHY GROWTH AT THE END OF THE GUARANTEED PERIOD.

3. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 4" LOAM, SEED, FERTILIZER, AND MULCH.

4. THREE (3) INCH BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS USED IN A CURBED ISLAND, THE BARK SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 4" LOAM, SEED, FERTILIZER AND MULCH.

5. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING AS SHOWN.

6. PARKING AREA PLANTED ISLANDS TO HAVE A MINIMUM OF 4" TOPSOIL. REMOVE ALL CONSTRUCTION DEBRIS BEFORE TOPSOILING. TOPSOIL SHALL BE PLACED TO TOP OF CURB.

7. ALL PLANT MATERIAL SHALL BE APPROVED BY THE OWNER OR THE OWNERS REPRESENTATIVE PRIOR TO ARRIVAL ON THE SITE.

8. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.

9. THE CONTRACTOR SHALL LOCATE, VERIFY, AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTINGS AND UTILITIES SHALL BE IMMEDIATELY REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.

10. NO SUBSTITUTION OF PLANT MATERIALS SHALL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.

12. SEE PLANTING DETAILS FOR WEED BARRIER INFORMATION.

13. ALL PLANTING LOCATED AT THE ENTRANCE TO THE PROJECT OR AT INTERSECTIONS WITHIN THE SITE WILL BE MAINTAINED AND WILL NOT EXCEED 3 FEET IN HEIGHT WITHIN A TRIANGLE FORMED 25' INTO THE DRIVEWAY AND 25' ALONG THE TRAVEL WAY.

EROSION CONTROL NOTES:

1. PRIOR TO BEGINNING ANY LAND DISTURBING ACTIVITIES, CLEARING AND GRADING LIMITS SHALL BE STAKED BY THE CONTRACTOR BASED ON THE LIMITS OF GRADING SHOWN ON THE DRAWINGS AND ACCEPTED BY THE OWNERS REPRESENTATIVE IN THE FIELD. AFTER THE CLEARING AND GRADING LIMITS HAVE BEEN ACCEPTED, THE CONTRACTOR SHALL INSTALL THE PERIMETER SILT FENCES AND THE CONSTRUCTION ENTRANCES ASSOCIATED WITH THE PROJECT.

2. ALL GROUND AREAS GRADED FOR CONSTRUCTION SHALL BE GRADED, LOAMED, SEEDED AND MULCHED AS SOON AS POSSIBLE. TEMPORARY/PERMANENT SEED MIXTURES SHALL CONFORM TO THE SEEDING PLAN CONTAINED IN THE EROSION CONTROL PROJECT PREPARED FOR THIS PROJECT.

3. PRIOR TO PAVING, THE CONTRACTOR SHALL FLUSH SILT FROM ALL STORM LINES.

4. ALL STORM DRAIN INLETS AND OUTLETS NOT IN PAVED AREAS ARE TO RECEIVE RIPRAP PROTECTION APRONS DURING CONSTRUCTION.

5. SILT FENCES SHALL BE INSPECTED, REPAIRED AND CLEANED AS NOTED IN THE EROSION CONTROL NOTES SHOWN ON THE EROSION CONTROL DETAIL SHEET.

6. THE CONTRACTOR SHALL REPAIR AND ADD STONE TO THE CONSTRUCTION ENTRANCE AS IT BECOMES SATURATED WITH MUD TO ENSURE THAT IT FUNCTIONS TO CAPTURE MUD FROM THE TIRES OF CONSTRUCTION VEHICLES DURING CONSTRUCTION. THE PURPOSE OF THE CONSTRUCTION ENTRANCE IS TO KEEP ADJACENT STREETS CLEAR OF DIRT AND MUD. SWEEPING OF THE ROADWAYS SHALL BE PERFORMED BY THE CONTRACTOR.

7. SILT REMOVED FROM AROUND INLETS AND BEHIND THE SILT FENCES SHALL BE PLACED ON A TOPSOIL STOCKPILE AND MIXED INTO TOPSOIL FOR USE IN LANDSCAPING OPERATIONS.

8. LAND DISTURBING ACTIVITIES SHALL BE ACCOMPLISHED IN A MANNER AND SEQUENCE WHICH CAUSE THE LEAST PRACTICAL UNPROTECTED DENUDED AREAS ON THE SITE DURING CONSTRUCTION.

9. THE CONTRACTOR IS CAUTIONED THAT FAILURE TO COMPLY WITH THE SEQUENCE OF CONSTRUCTION, EROSION / SEDIMENT CONTROL PLAN, AND OTHER PERMIT REQUIREMENTS MAY RESULT IN MONETARY PENALTIES AS ENFORCED BY THE MEDEP OR LOCAL AGENCIES. THE CONTRACTOR SHALL BE ASSESSED ALL SUCH PENALTIES AT NO COST TO THE OWNER OR PERMITTEE.

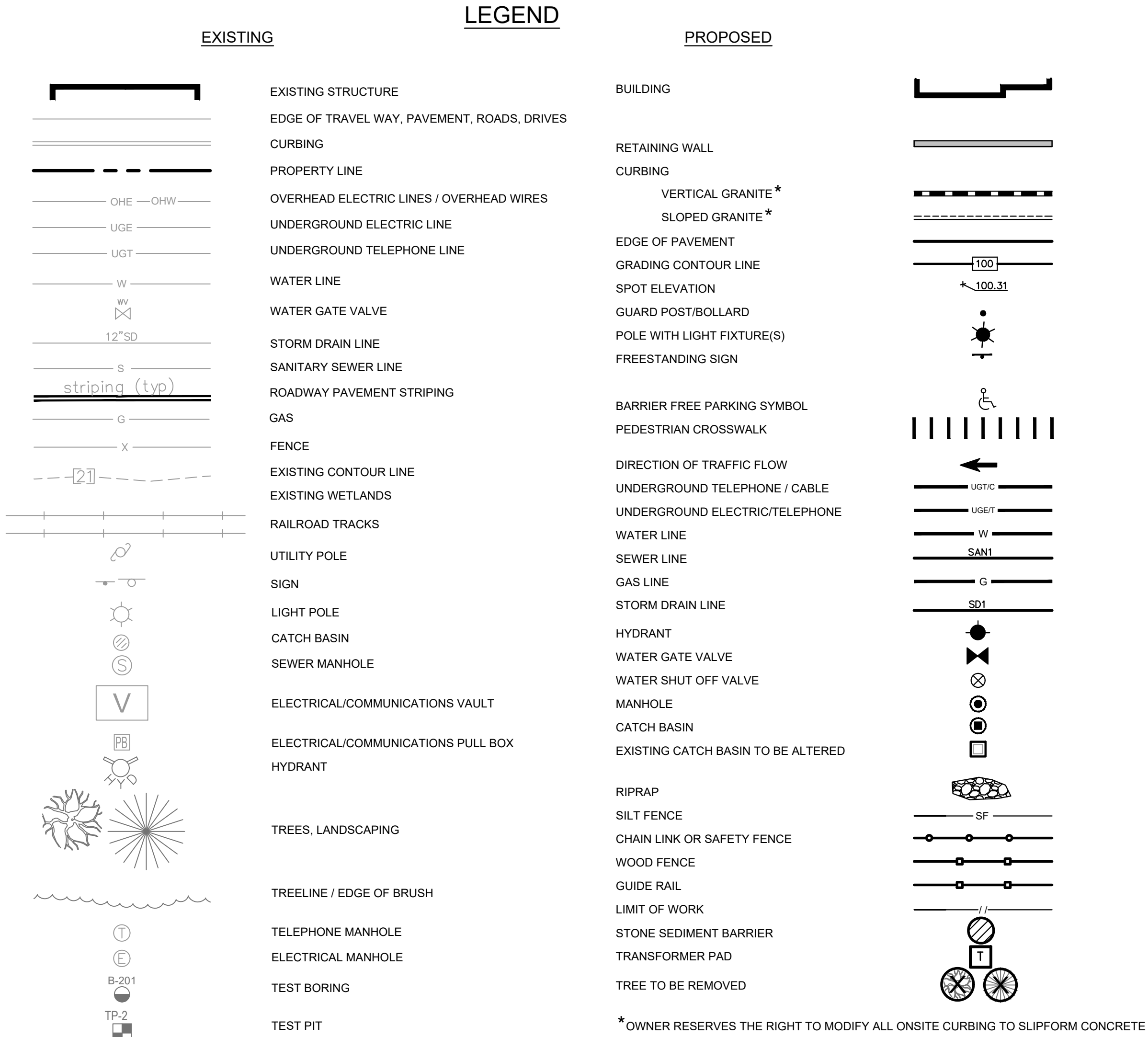
10. A FULL EROSION/SEDIMENTATION CONTROL PLAN ACCOMPANIES THIS DRAWING SET AND IS ALSO CONTAINED IN THE SITE WORK SPECIFICATIONS.

11. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS AS SHOWN AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED.

12. INSPECT EROSION AND SEDIMENT CONTROL DEVICES AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS $\frac{1}{2}$ THE STRUCTURE HEIGHT.

13. INSTALL CURLEX EROSION CONTROL MAT OR EQUAL ON ALL SLOPES STEEPER THAN 3:1.

14. THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "MAINE EROSION & SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES, CUMBERLAND COUNTY SOIL AND WATER CONVERSATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MARCH 1991"



CITY OF PORTLAND
SPACE AND BULK REQUIREMENTS

1. EXISTING ZONE:	B5b - Urban Commercial Mixed-Use Zone R-4 - Residential Zone	
2. PARCEL SIZE:	8.40 ACRES	
3. SPACE AND BULK:		
MAXIMUM LOT COVERAGE	<u>REQUIRED / ALLOWED</u> 100%	<u>PROVIDED</u> < 100%
MAXIMUM BUILDING HEIGHT	55 FT. (62 FT. FOR ROOFTOP PROJECTIONS)	< 55 FT.
MINIMUM LOT SIZE	NONE	8.40 ACRES
MINIMUM SIDE YARD	NONE	5.3 FT.±
MINIMUM REAR YARD	NONE	120 FT.±
MINIMUM FRONTAGE	NONE	1,394 FT.
MAXIMUM FRONT YARD BUILDING SETBACK	10 FT.	< 10 FT.
4. PARKING REQUIREMENT:		
MEDICAL OFFICE - 1 SPACE/400SF		
PROPOSED OUTPATIENT CLINIC 62,300 SF	156 SPACES	400± SPACES (SATISFIES TENANT LEASE REQUIREMENTS)

SITE LAYOUT NOTES:

1. ALL HANDICAP PARKING SPACES ARE TO RECEIVE HANDICAP SIGNS AND PAVEMENT MARKINGS AS ILLUSTRATED ON THE DETAIL SHEETS.

2. BITUMINOUS CONCRETE CURB AND GRANITE CURB SHALL MEET THE REQUIREMENTS OF MDOT 702.01, 703.07, AND 609.04.

3. ALL DIMENSIONING, UNLESS NOTED OTHERWISE, IS TO THE FACE OF CURB OR THE FACE OF THE BUILDING.

4. EXCEPT WHERE INDICATED OTHERWISE, THE PAVEMENT IS TO BE STANDARD DUTY PAVEMENT.

5. ALL TRAFFIC CONTROL SIGNS INDICATED ON THE SITE LAYOUT PLAN ARE TO MEET ALL REQUIREMENTS AND STANDARDS OF THE MAINE DEPARTMENT OF TRANSPORTATION, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITIONS AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS.

6. STRIPE PARKING AREAS, DRIVES AND ROADWAY AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, HANDICAP SYMBOLS, PAINTED ISLANDS AND FIRE LANES. (ALL MARKINGS EXCEPT MEDIAN ISLANDS AND CENTERLINES TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT.) ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". MEDIAN ISLANDS AND CENTERLINES TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT.

7. SEE DETAILS FOR PARKING STALL DIMENSIONS, HANDICAP SYMBOLS, SIGNS AND SIGN POSTS.

8. STOP BARS SHALL BE 12" WIDE.

9. PAINTED ISLANDS SHALL BE 4" WIDE DIAGONAL LINES @ 3'-0" O.C. BORDERED BY 4" WIDE LINES.

GRADING & DRAINAGE NOTES:

1. ALL STORM DRAIN PIPE SHALL BE SMOOTH BORE INTERIOR PROVIDING A MANNINGS ROUGHNESS COEFFICIENT OF n = 0.013 OR LESS.

2. PROVIDE TURF REINFORCEMENT IN AREAS INDICATED ON THE PLANS.

3. AN "AS-BUILT" CERTIFICATION OF THE STORMWATER DRAINAGE SYSTEM BY A REGISTERED ENGINEER IS REQUIRED PRIOR TO THE OWNER ACCEPTING THE BUILDING AND PROPERTY. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT ANY DEVIATION FROM THE PLANS MAY DELAY THE ACCEPTANCE OF THE PROJECT.

4. A DETAILED O&M MANUAL FOR STORMWATER MANAGEMENT SYSTEMS IS (WILL BE) FILED WITH THE CITY OF PORTLAND DURING THE PERMIT REVIEW PROCESS. A SPECIFIC MANUAL HAS BEEN PREPARED FOR O&M OF THE DRAINAGE SYSTEM.

5. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.

6. SEE GRADING, DRAINAGE AND EROSION/SEDIMENT CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.

7. ALL DISTURBED AREAS NOT TO BE PAVED, SODDED OR OTHERWISE TREATED SHALL RECEIVE 4" LOAM, SEED, FERTILIZER AND MULCH.

8. COMPACTION REQUIREMENTS:		
LOCATION	MINIMUM COMPACTION	
SUBBASE AND BASE GRAVEL BELOW PAVED OR CONCRETE AREAS	95%	
SUBGRADE FILL BELOW PAVED AREAS	90%	
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%	
BELOW LOAM AND SEED AREAS	90%	
STRUCTURAL FILL WITHIN PROPOSED BUILDING AREA	95%	
SELECT FILL ADJACENT BUILDING FOUNDATIONS, EXTERIOR FOUNDATIONS, AND WITHIN 8 INCHES OF THE SLAB-ON-GRADE	95%	
*ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557.		

RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-GEN NOTES.dwg		
This plan shall not be modified without written permission from Gorrill Palmer Consulting Engineers, Inc.(GP). Any alterations, authorized or otherwise, shall be at the user's sole risk and without liability to GP.		



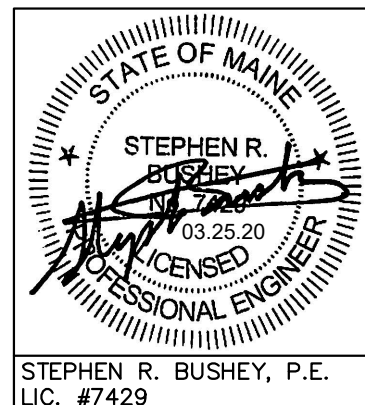
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207.772.2515

Drawing Name:	GENERAL NOTES & LEGEND
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.

C-1.1

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.



PLAN REFERENCES

- 1) Plan of Land on West Commercial Street Maine Central Railroad to J.B. Brown & Sons by Owen Haskell, Inc. dated October 13, 2011. Recorded in Plan Book 215, Page 350.
- 2) State of Maine Department of Transportation Right of Way Map of State Highway "10" D.O.T. File No. 3-483. Sheets 16-19. Recorded in Plan Book 208, Pages 16-19.
- 3) Maine State Highway Commission Right of Way Map of State Highway "A" S.H.C. File No. 3-77. Sheets 1 & 2. Recorded in Plan Book 43, Pages 52 & 54.
- 4) Plan of West Commercial Street Alteration by City of Portland, Maine Department of Public Works dated July 1, 1952.
- 5) Street right of way plans obtained from the City of Portland Engineering Department for West Commercial Street, Emery Street, and Danforth Street.
- 6) Plans of Pollution Abatement Facilities West Commercial Street made for Portland Water District by Comp. Dresser & McKee, Inc. dated April 1973 and revised through August 1981. Sheets 25-29. On file at the City of Portland Department of Engineering.
- 7) Plan of Condominium Plat, Southrise Condominium made for Coastland Corp. by Sebago Technics, Inc. dated March 13, 1989 and revised through June 2, 1989. Recorded in Plan Book 179, Page 44.
- 8) Plan of Boundary Survey made for Mark & Aimee Bassire by Owen Haskell dated September 8, 2014. Unrecorded.
- 9) Plan of Land on West Commercial Street Portland Terminal Company to J.B. Brown & Sons by Owen Haskell dated July 27, 2010. Recorded in Plan Book 210, Page 285.
- 10) Right of Way and Track Map - Portland Terminal Operated by Portland Terminal Company. Sheets VID-1 & VID-2 dated June 30, 1916. Station 0+00 to Station 105+60. On file at PanAm Railway Department of Engineering.
- 11) Plan of Property made for Constance Bloomfield by Titcomb Associates dated October 20, 2004 revised through October 5, 2005. Recorded in Plan Book 205, Page 635.
- 12) Plan of ALTA/ACSM Land Title Survey - 113 West Commercial Street, made for J.B. Brown & Sons by Titcomb Associates dated February 9, 2016.

NOTES

- 1) Book and Page references are to the Cumberland County Registry of Deeds.
- 2) Bearings are referenced to grid north, Maine State Plane Coordinate System, NAD83, West Zone.
- 3) Property lies within Zone C based on FIRM Community #230051 Panels #0015-B & #0016-B, dated July 17, 1986. It does not lie within a special flood hazard area.
- 4) The purpose of this plan is to divide the locus properly into two lots. Many features, notes, utilities, etc. are not shown; see Plan Reference 12.

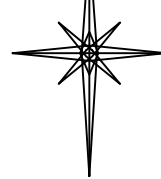
AREA

As noted.

OWNER OF RECORD

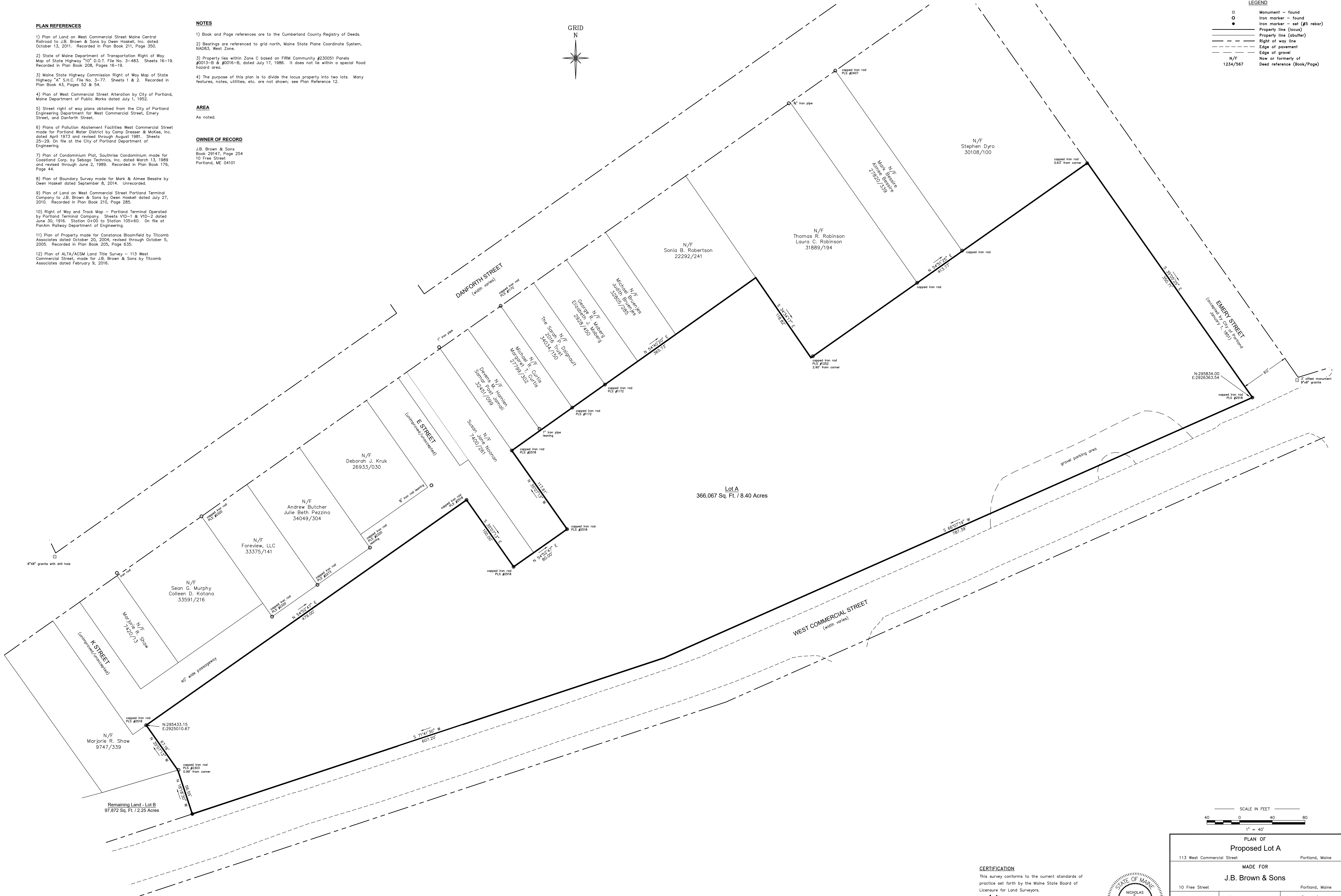
J.B. Brown & Sons
Book 29147, Page 254
10 Free Street
Portland, ME 04101

GRID
N



LEGEND

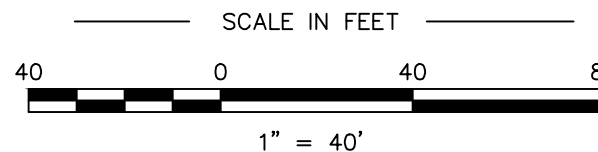
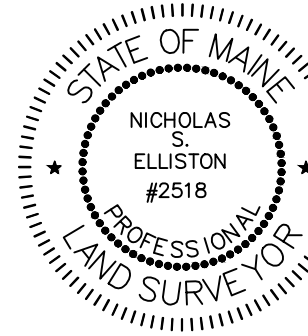
- Monument - found
- Iron marker - found
- Iron marker - set (#5 rebar)
- Property line (locus)
- Property line (abutter)
- Right of way line
- - - Edge of pavement
- - - Edge of gravel
- N/F Now or formerly of
- 1234/567 Dead reference (Book/Page)



CERTIFICATION

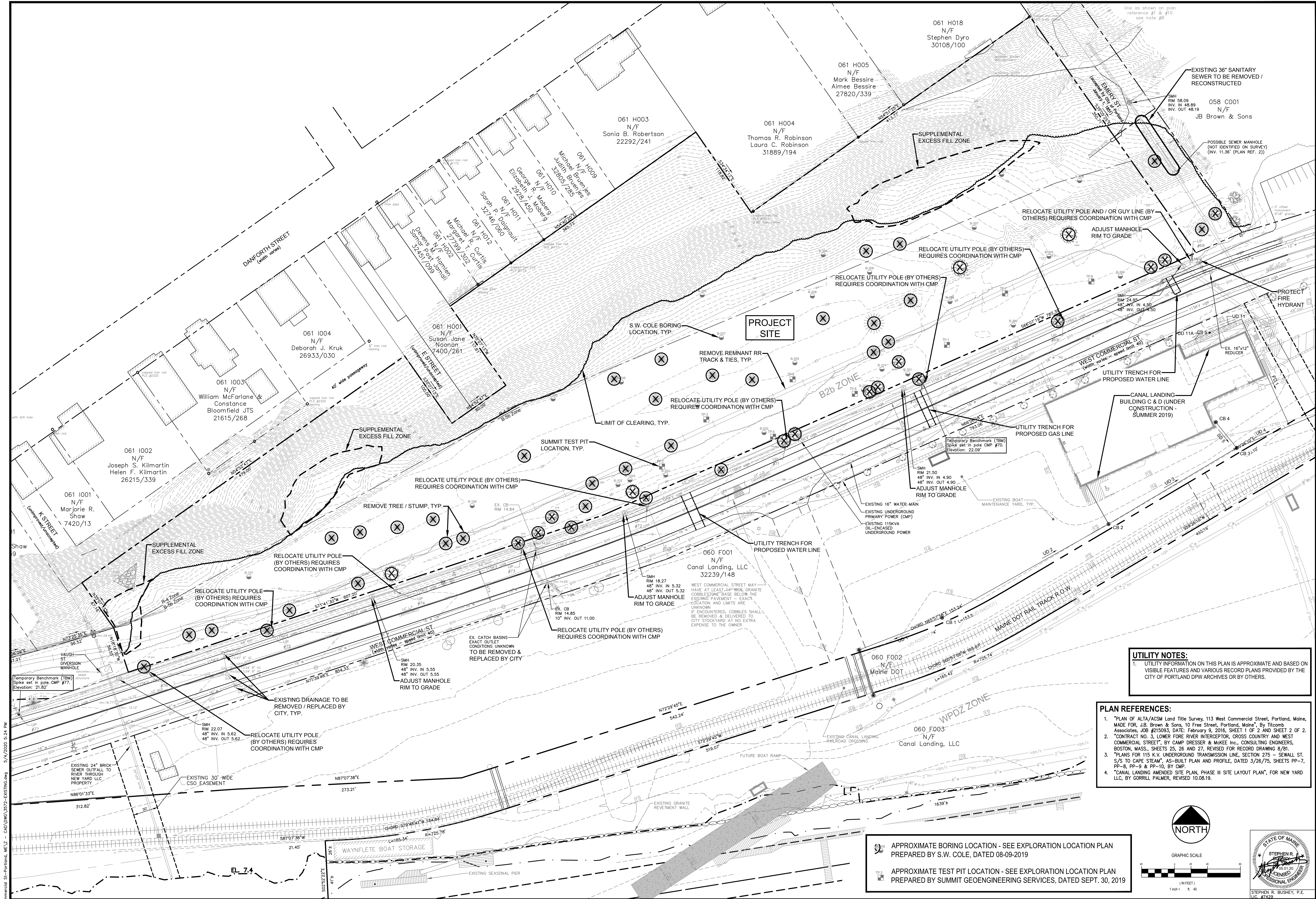
This survey conforms to the current standards of practice set forth by the Maine State Board of Licensure for Land Surveyors.

Nicholas S. Elliston
Nicholas S. Elliston, P.L.S. #2518



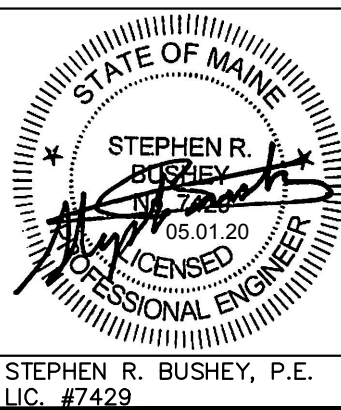
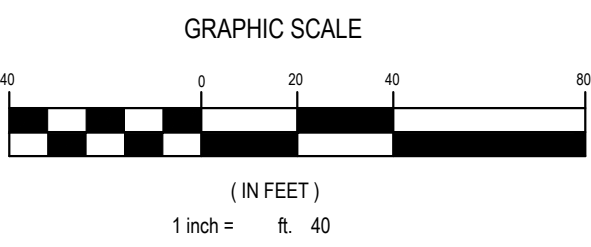
PLAN OF Proposed Lot A		
113 West Commercial Street Portland, Maine		
MADE FOR J.B. Brown & Sons		
10 Free Street Portland, Maine		
JOB #215093	DATE: November 12, 2019	SCALE: 1" = 40'
BOOK #891		
215093_Lot Division.dwg		
FILE #8805		

Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com



UTILITY NOTES:
1. UTILITY INFORMATION ON THIS PLAN IS APPROXIMATE AND BASED ON VISIBLE FEATURES AND VARIOUS RECORD PLANS PROVIDED BY THE CITY OF PORTLAND DPW ARCHIVES OR BY OTHERS.

- PLAN REFERENCES:**
1. "PLAN OF ALTA/ACSM Land Title Survey, 113 West Commercial Street, Portland, Maine, MADE FOR, J.B. Brown & Sons, 10 Free Street, Portland, Maine," By Titcomb Associates, JOB #215093, DATE: February 9, 2016, SHEET 1 OF 2 AND SHEET 2 OF 2.
 2. "CONTRACT NO. 3, LOWER FORD RIVER INTERCEPTOR, CROSS COUNTRY AND WEST COMMERCIAL STREET," BY CAMP DRESSER & McKEE Inc., CONSULTING ENGINEERS, BOSTON, MASS., SHEETS 25, 26 AND 27, REVISED FOR RECORD DRAWING 8/81.
 3. "PLANS FOR 115 K.V. UNDERGROUND TRANSMISSION LINE, SECTION 275 - SEWALL ST. S/S TO CAPE STEAM," AS-BUILT PLAN AND PROFILE, DATED 3/26/75, SHEETS PP-7, PP-8, PP-9 & PP-10, BY CMP.
 4. "CANAL LANDING AMENDED SITE PLAN, PHASE III SITE LAYOUT PLAN," FOR NEW YARD LLC, BY GORRILL PALMER, REVISED 10.08.19.



APPROXIMATE BORING LOCATION - SEE EXPLORATION LOCATION PLAN PREPARED BY S.W. COLE, DATED 08-09-2019

APPROXIMATE TEST PIT LOCATION - SEE EXPLORATION LOCATION PLAN PREPARED BY SUMMIT GEOENGINEERING SERVICES, DATED SEPT. 30, 2019

Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		By

Design: SRB Draft: CDD Date: NOV. 2019
Checked: SRB Scale: 1" = 40' Job No.: 3572
File Name: 3572-EXISTING.dwg
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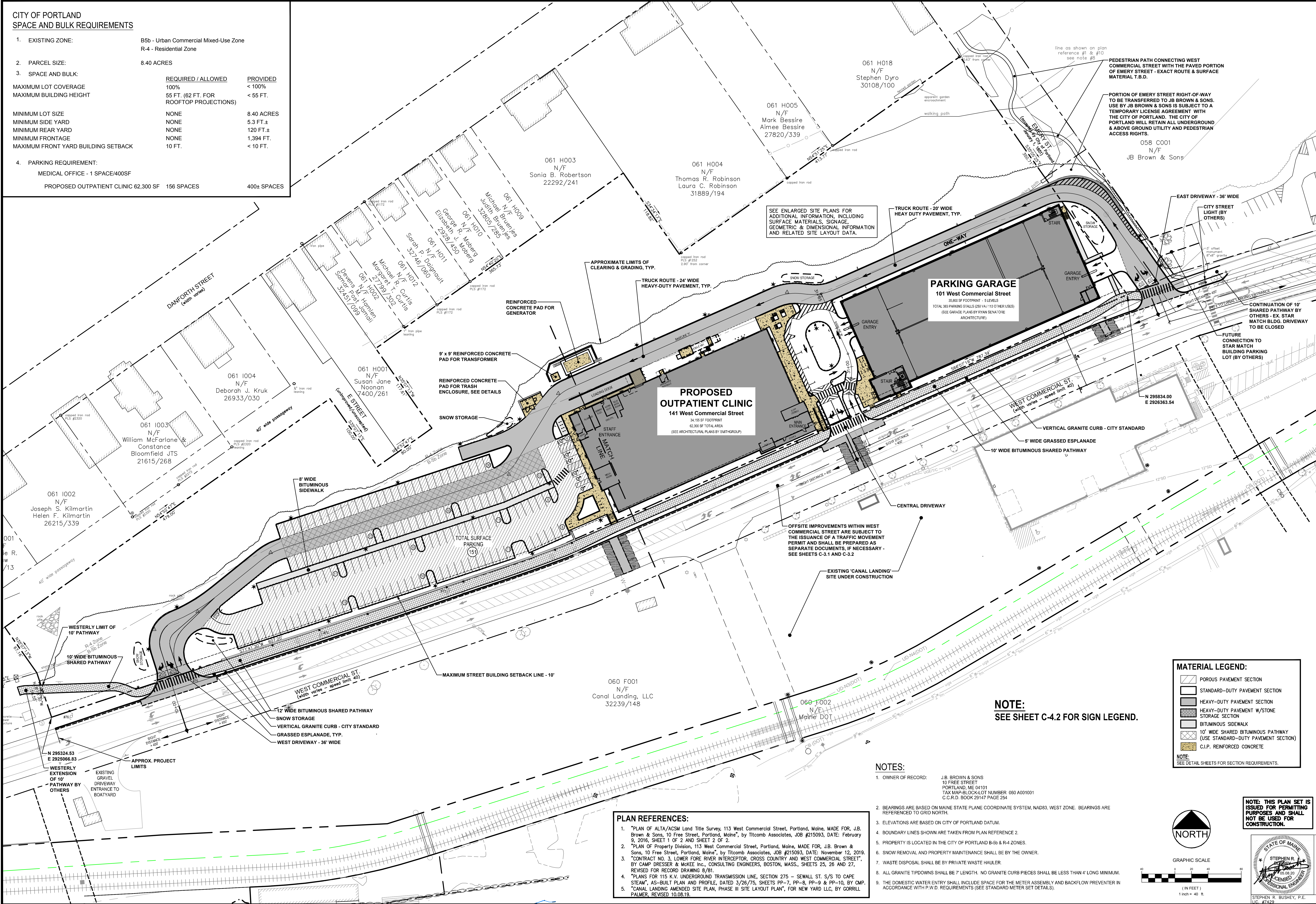
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Drawing Name: **EXISTING CONDITIONS & REMOVALS PLAN**

Project: **U.S. Department of Veterans Affairs - Community Based Outpatient Clinic**
141 West Commercial Street, Portland, Maine

Client: **FDS JBB PORTLAND, LLC**
10 Free Street, Portland, Maine 04101

Drawing No. **C-3.0**



U:\3572_VA Clinic West Commercial St-Portland, ME\Z - CAD\DWG\3572-SITE.dwg 5/8/2020 4:24 PM



**PROPOSED
OUTPATIENT CLINIC**

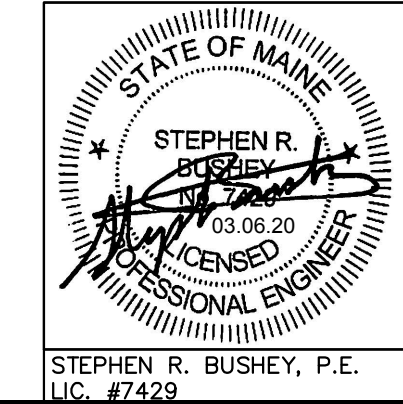
141 West Commercial Street

34,155 SF FOOTPRINT
62,300 SF TOTAL AREA

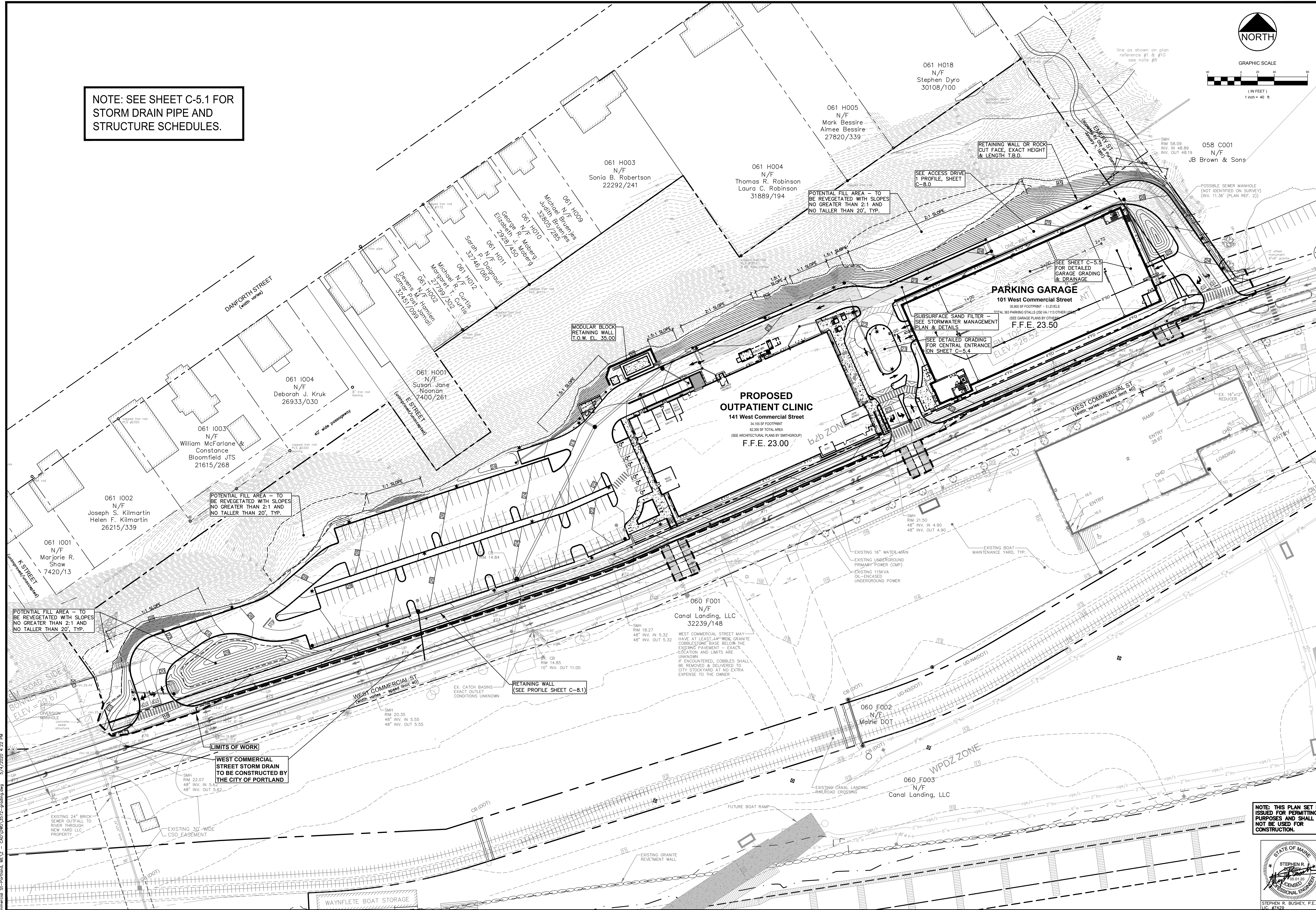
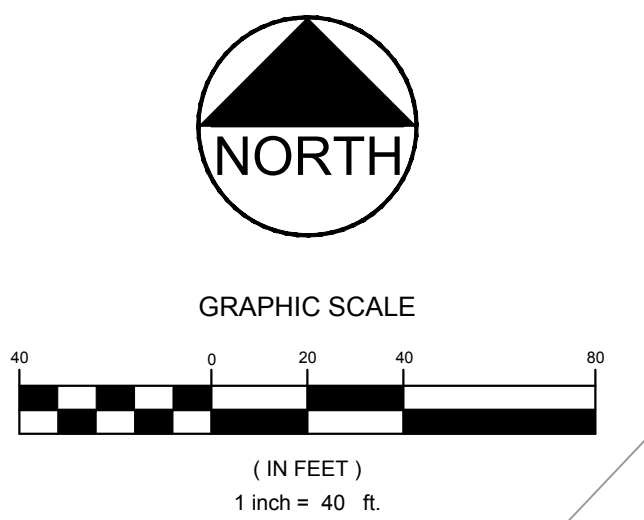
(SEE ARCHITECTURAL PLANS BY SMITHGROUP)

F.F.E. 23.00

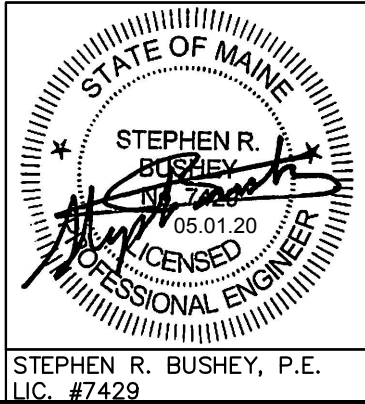
**NOTE: THIS PLAN SET IS
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PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.**

[illegible]

NOTE: SEE SHEET C-5.1 FOR
STORM DRAIN PIPE AND
STRUCTURE SCHEDULES.



NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.



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Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		By

Design: SRB Draft: CDD Date: NOV. 2019
Checked: SRB Scale: AS NOTED Job No.: 3572
File Name: 3572-grading.dwg
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Drawing Name:	OVERALL GRADING & DRAINAGE PLAN
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.
C-5.0

NOTE:

The Contractor shall ensure clean fill including Topsoil, brought to the site is not from a site known to have invasive weeds that are listed on the Maine Natural Areas Program *Advisory List of Invasive Plants*. In addition, and in accordance with Section 4.7.4 of the City's Technical Manual, the Contractor is shall routinely inspect the site for invasive weeds during construction and remove any that are found through the use of physical means and/or the use of herbicides, applied according to all local, state and federal regulations.

061 1004
N/F
Deborah J. Kruk
26933/030

061 H001
N/F
Susan Jane Noonan
7400/261

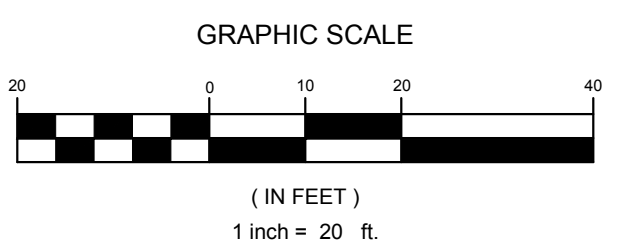
061 1003
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William McFarlane &
Constance
Bloomfield JTS
21615/268

061 1002
N/F
Joseph S. Kilmartin
Helen F. Kilmartin
26215/339

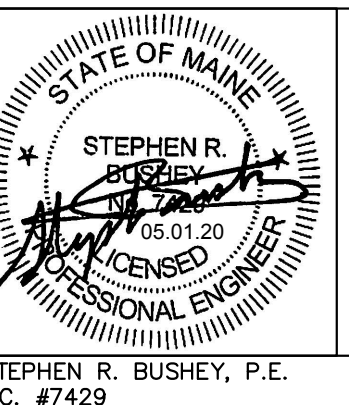
060 F001
N/F
Canal Landing, LLC
32239/148

STORM DRAIN STRUCTURE SCHEDULE				
STRUCTURE	SIZE	RIM	INV. IN/SIZE (FROM)	INV. OUT/SIZE (TO)
DMH 1	6"	23.91	18.50/12"(POROUS PMVT) 11.84/30"(DMH 2) 18.50/12"(DMH 7)	11.76/30"(DMH 11)
DMH 2	5"	22.78	17.36/18"(CB 12) 12.65/30"(DMH 3)	12.55/30"(DMH 1)
DMH 3	5"	23.16	13.98/6"(CB 1) 13.14/30"(CB 1)	13.04/30"(DMH 2)
DMH 4	4"	23.80	18.05/24"(CB 3)	15.95/24"(CB 2)
DMH 5	4"	26.02	18.86/12"(CB 6)	18.76/12"(CB 5)
DMH 6	4"	26.70		21.65/18"(DMH 11)
DMH 7	4"	21.98	18.00/4"(OVERFLOW-) 18.00/8"(POROUS PAVE)	17.90/12"(DMH 1)
DMH 9*	2' SQ	23.02	19.08/8"(RD-1)	18.98/8"(CB 10)
DMH 10	4"	23.53	17.81/12"(CB 15) 17.81/12"(CB 17)	17.71/12"(SAND FILTER 2)
DMH 11	5"	26.30	18.98/18"(DMH 6) 11.40/30"(DMH 1) 21.04/4"(OVERFLOW)	11.30/30"(DMH M4)
DMH 12	4"	19.00	14.80/12"(FC RISER)	14.70/12"(CB 8)
OCS 1	4"	22.85	17.78/12"(CB 10)	18.20/12"(CB 1) 17.68/12"(SAND FILTER)
OCS 2	4"	24.11	17.72/18"(CB 5)	18.20/18"(CB 4) 17.62/12"(SAND FILTER 1)

* 2' SQUARE STRUCTURE WITH SOLID TOP



NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.



Drawing No.

C-5.1

STORM DRAIN STRUCTURE SCHEDULE				
STRUCTURE	SIZE	RIM	INV. IN/SIZE (FROM)	INV. OUT/SIZE (TO)
CB 1*	6"	23.90	14.30/24"(CB 2) 15.61/12"(OCS 1) 14.10/6"(SAND FILTER OUTLET)	13.45/30"(DMH 3)
CB 2*	4"	22.60	15.26/24"(DMH 4)	15.16/24"(CB 1)
CB 3*	4"	23.57	16.65/24"(CB 4)	16.55/24"(DMH 4)
CB 4*	4"	24.74	18.05/18"(OCS 2)	17.95/24"(CB 3)
CB 5	4"	23.96	17.92/12"(DMH 5) 17.92/12"(CB 14)	17.79/18"(OCS 2)
CB 6	4"	23.36	19.38/12"(CB 7)	19.28/12"(DMH 5)
CB 7	4"	23.36	19.49/12"(DMH 5)	19.43/8"(CB-7B)
CB 7A	4"	23.10	17.96/8"(CB 7B)	17.86/8"(OIL-WAT-SEP)
CB 7B	4"	23.10	18.68/8"(CB-7C)	18.58/8"(CB 7A)
CB 7C	4"	23.10		19.43/8"(CB-7B)
CB 7D	4"	23.00		17.77/8"(OIL-WAT-SEP)
CB 8*	4"	18.52	14.35/12"(DMH 12)	14.25/15"(DMH M2)
CB 10	4"	22.50	18.18/8"(DMH 9) 18.50/8"(RD-3)	17.84/12"(OCS 1)
CB 11*	4"	23.60		18.68/12"(CB 12)
CB 12*	4"	21.98	17.68/12"(CB 11) 17.68/12"(CB 19)	17.58/18"(DMH 2)
CB 13**	2' SQ	18.60		14.50/8"(DMH 3)
CB 14	4"	22.57		18.89/12"(CB 5)
CB 15	4"	21.80	18.35/12"(CB 16) 18.35/4"(ROOF DRAIN)	18.25/12"(DMH 10)
CB 16	4"	22.88		19.00/12"(CB 15)
CB 17	4"	22.40	18.58/8"(RD-2)	18.48/12"(DMH 10)
CB 19*	2' SQ	22.28		18.40/12"(CB 12)

* BEEHIVE GRATE

** SEE SHEET C-9.3 FOR CARTRIDGE INSERT DETAILS FOR CB 13

PIPE SCHEDULE			
Pipe Name	Size	Length	Slope
SD 1	30"	121.9'	0.29%
SD 2	30"	203.0'	0.35%
SD 3	30"	104.6'	0.36%
SD 4	30"	40.7'	0.71%
SD 5	24"	126.2'	0.67%
SD 6	24"	69.0'	1.00%
SD 7	24"	56.0'	0.90%
SD 8	24"	124.7'	1.04%
SD 9	18"	15.4'	1.00%
SD 10	18"	7.5'	1.00%
SD 11	12"	168.9'	0.49%
SD 12	12"	84.7'	0.48%

PIPE SCHEDULE			
Pipe Name	Size	Length	Slope
SD 13	12"	22.3'	0.50%
SD 14	18"	131.3'	1.99%
SD 15	30"	57.0'	0.26%
SD 16	15"	83.7'	1.12%
SD 17	12"	91.0'	1.08%
SD 18	12"	47.8'	0.70%
SD 19	12"	138.7'	1.01%
SD 20	18"	16.2'	1.06%
SD 21	12"	16.7'	1.317%
SD 22	12"	7.7'	0.79%
SD 23	8"	80.5'	1.00%
SD 24	8"	20.6'	1.05%

PIPE SCHEDULE			
Pipe Name	Size	Length	Slope
SD 25	8"	35.6'	1.46%
SD 27	12"	32.3'	1.28%
SD 28	12"	48.3'	1.34%
SD 29	12"	62.6'	1.00%
SD 30	8"	24.3'	2.50%
SD 31	12"	7.3'	5.05%
SD 32	12"	129.1'	0.75%
SD 33	8"	16.8'	1.67%
SD 34	12"	5.6'	7.66%
SD 35	12"	40.8'	1.61%
SD 36	6"	12.0'	2.67%

WEST COMMERCIAL ST.
(width varies - speed limit 40)

RETAINING WALL
(SEE PROFILE SHEET C-8.1)

EX. CATCH BASINS
EXACT OUTLET
CONDITIONS UNKNOWN

REMOVE & REPLACE
EXISTING CATCH BASIN WITH
5' DIA. STRUCTURE (CB 18)

SMH
RIM 18.27
48" INV. IN 5.32
48" INV. OUT 5.32

SMH
RIM 20.35
48" INV. IN 5.55
48" INV. OUT 5.55

LIMITS OF WORK

WEST COMMERCIAL STREET STORM DRAIN TO BE
CONSTRUCTED BY THE CITY OF PORTLAND

EXTENSION
OF PATHWAY
(BY OTHERS)

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Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		By

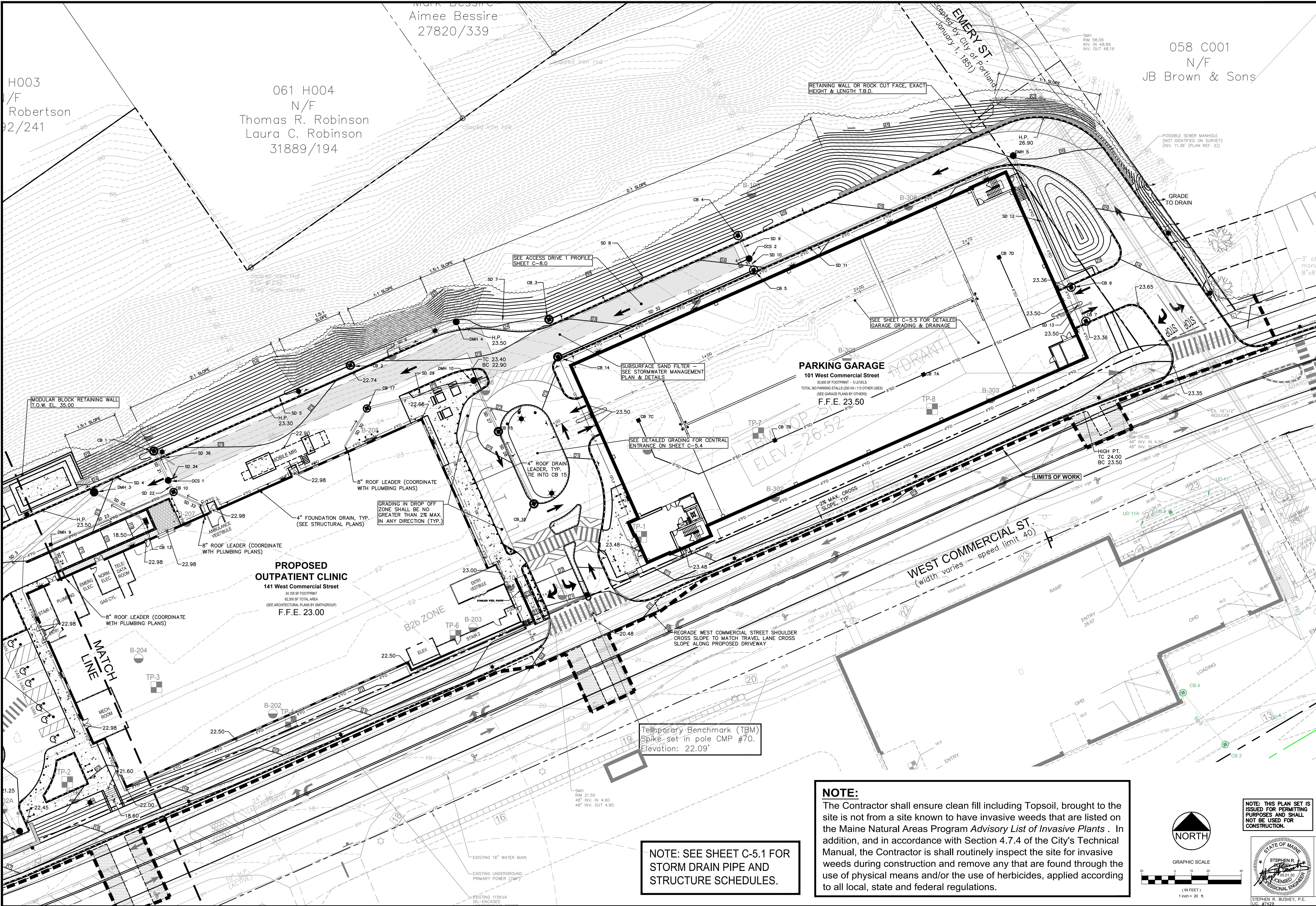
Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572--grading.dwg		
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Drawing Name:	GRADING & DRAINAGE PLAN - WEST SIDE
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.



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Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
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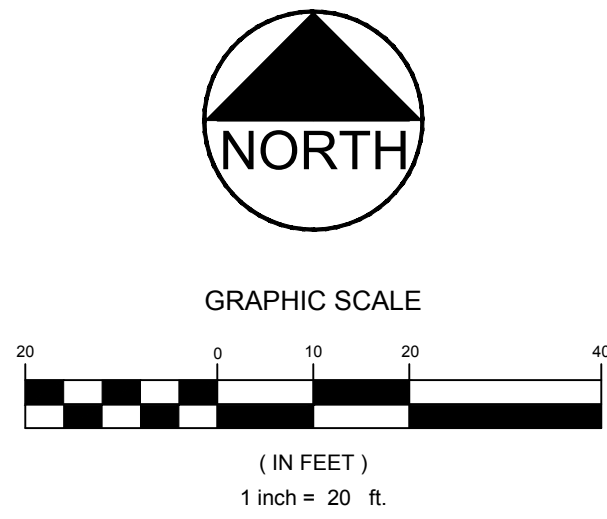
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Drawing Name:	GRADING & DRAINAGE PLAN - EAST SIDE
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-5.2
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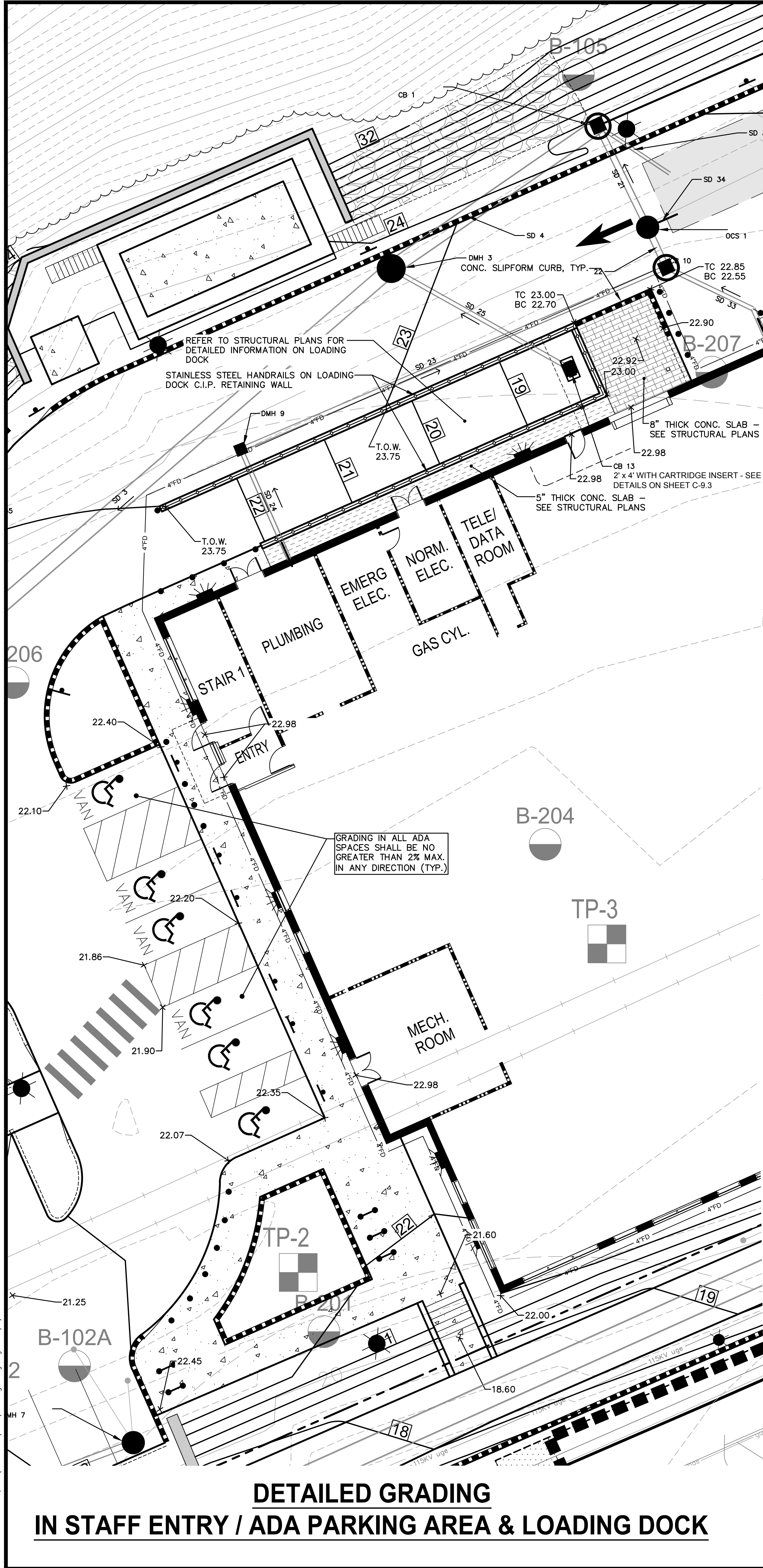
NOTE:
The Contractor shall ensure clean fill including Topsoil, brought to the site is not from a site known to have invasive weeds that are listed on the Maine Natural Areas Program *Advisory List of Invasive Plants*. In addition, and in accordance with Section 4.7.4 of the City's Technical Manual, the Contractor is shall routinely inspect the site for invasive weeds during construction and remove any that are found through the use of physical means and/or the use of herbicides, applied according to all local, state and federal regulations.

NOTE: SEE SHEET C-5.1 FOR STORM DRAIN PIPE AND STRUCTURE SCHEDULES.

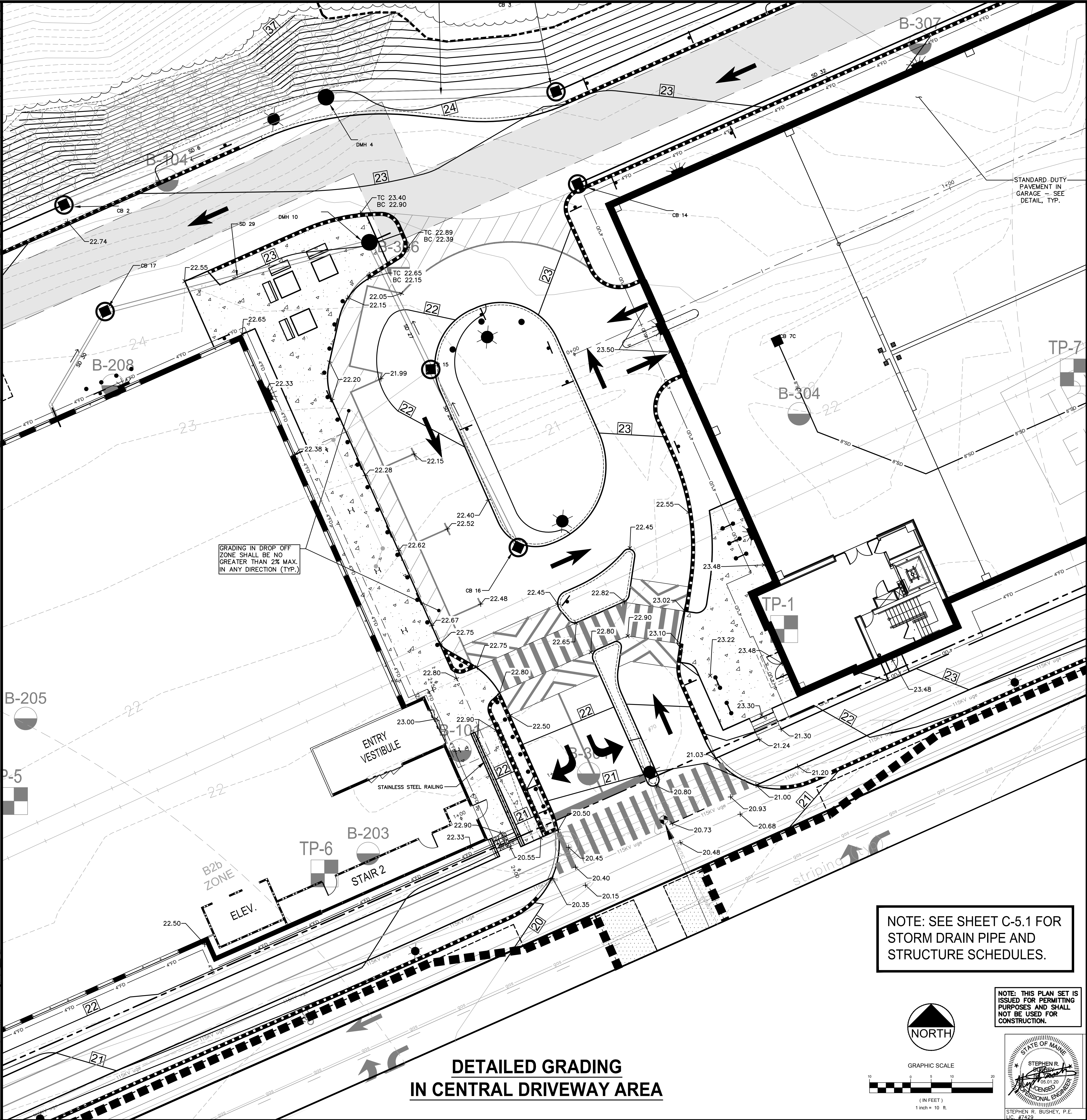


NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.

STATE OF MAINE
STEPHEN R. BUSHEY, P.E.
Professional Engineer
License #72628



**DETAILED GRADING
IN STAFF ENTRY / ADA PARKING AREA & LOADING DOCK**



**DETAILED GRADING
IN CENTRAL DRIVEWAY AREA**

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2	05.01.20	REVISED AND RESUBMITTED TO CITY
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LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

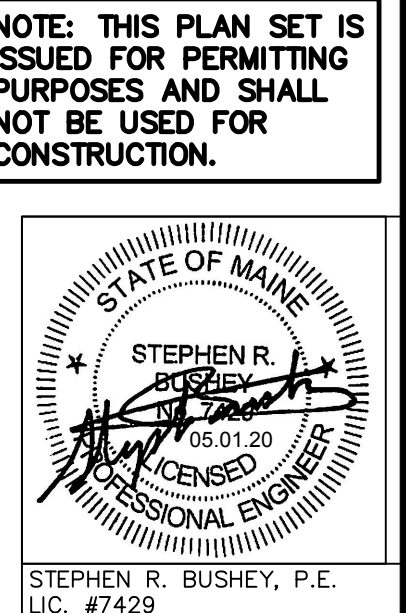
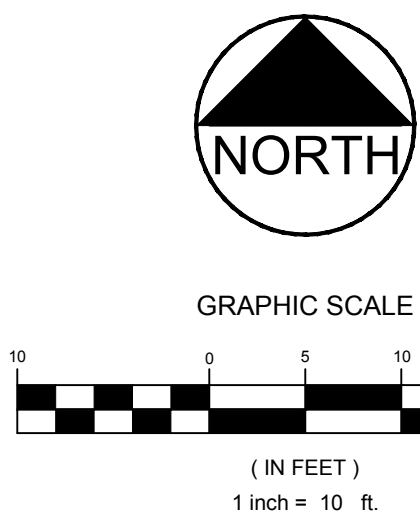
Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-grading.dwg		
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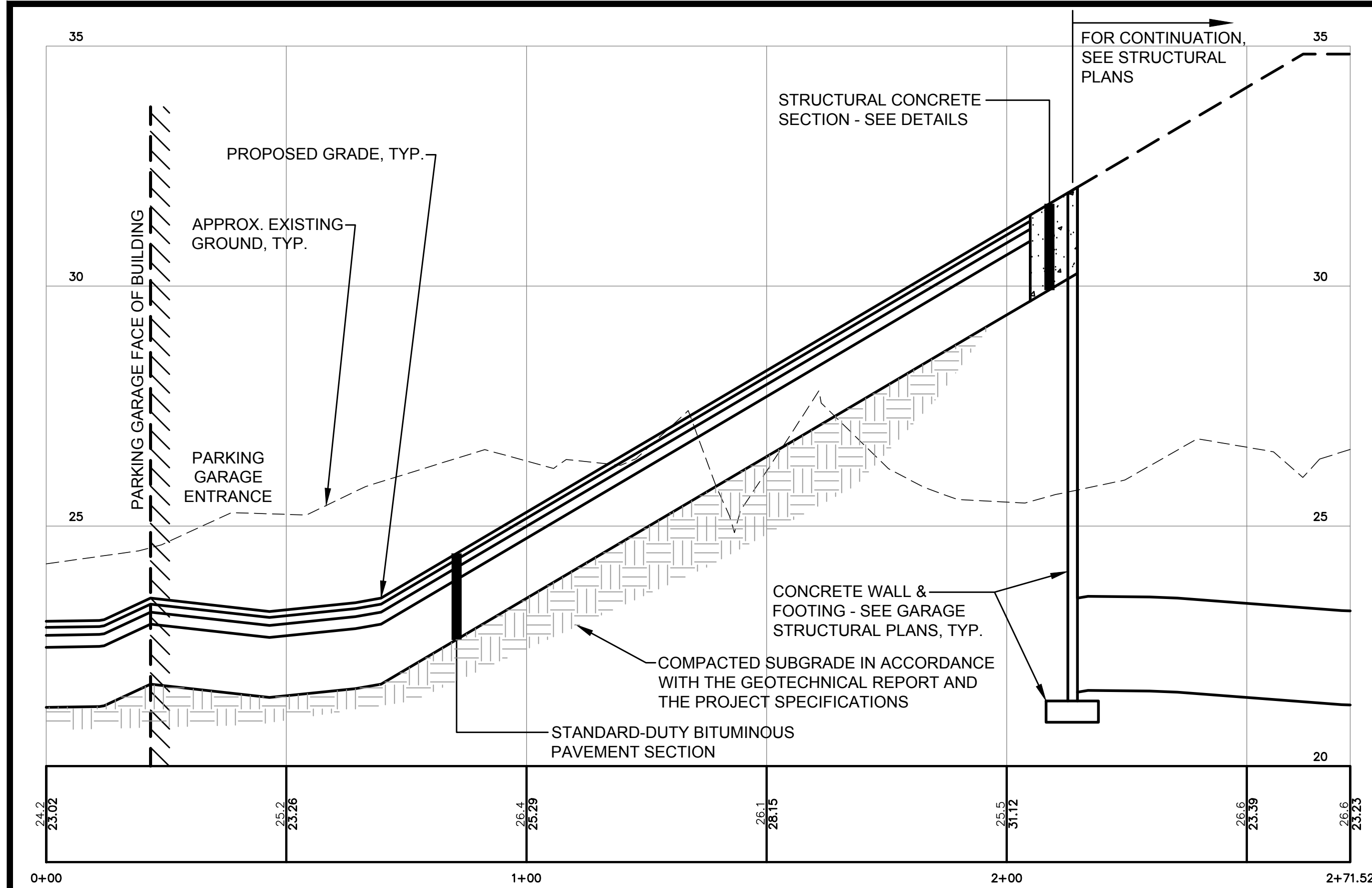


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Drawing Name:	DETAILED GRADING PLANS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

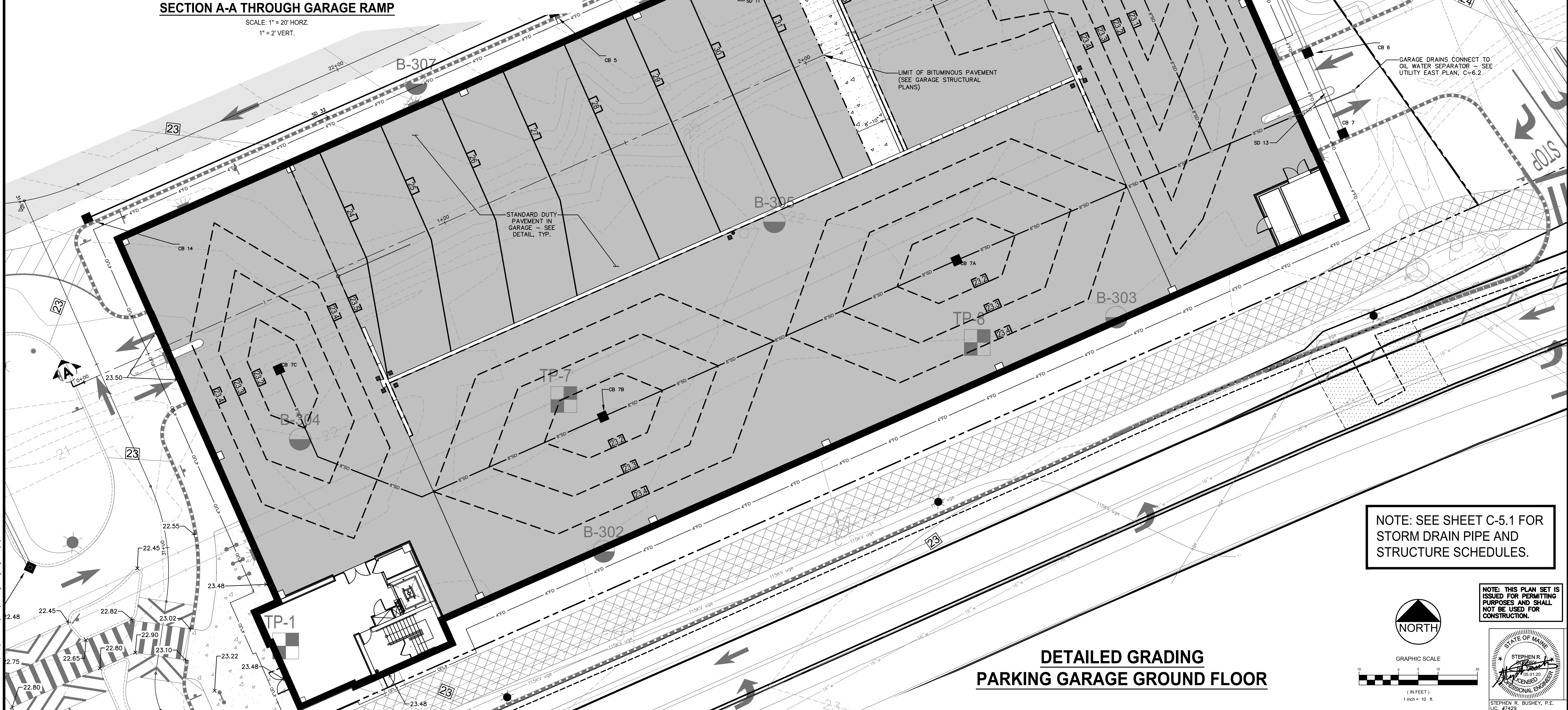
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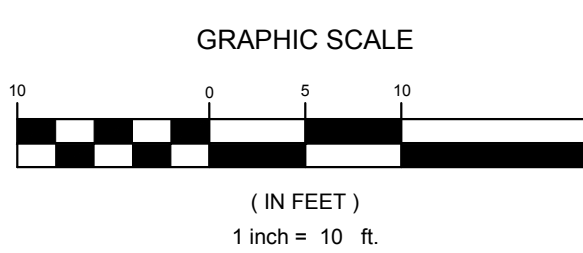
SECTION A-A THROUGH GARAGE RAMP

SCALE: 1" = 20' HORZ.
1" = 2' VERT.

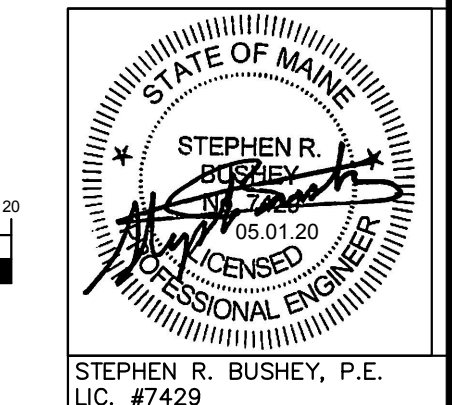


DETAILED GRADING
PARKING GARAGE GROUND FLOOR

NOTE: SEE SHEET C-5.1 FOR
STORM DRAIN PIPE AND
STRUCTURE SCHEDULES.



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TMP APPLICATION	11.22.19	SRB
Issued For		By

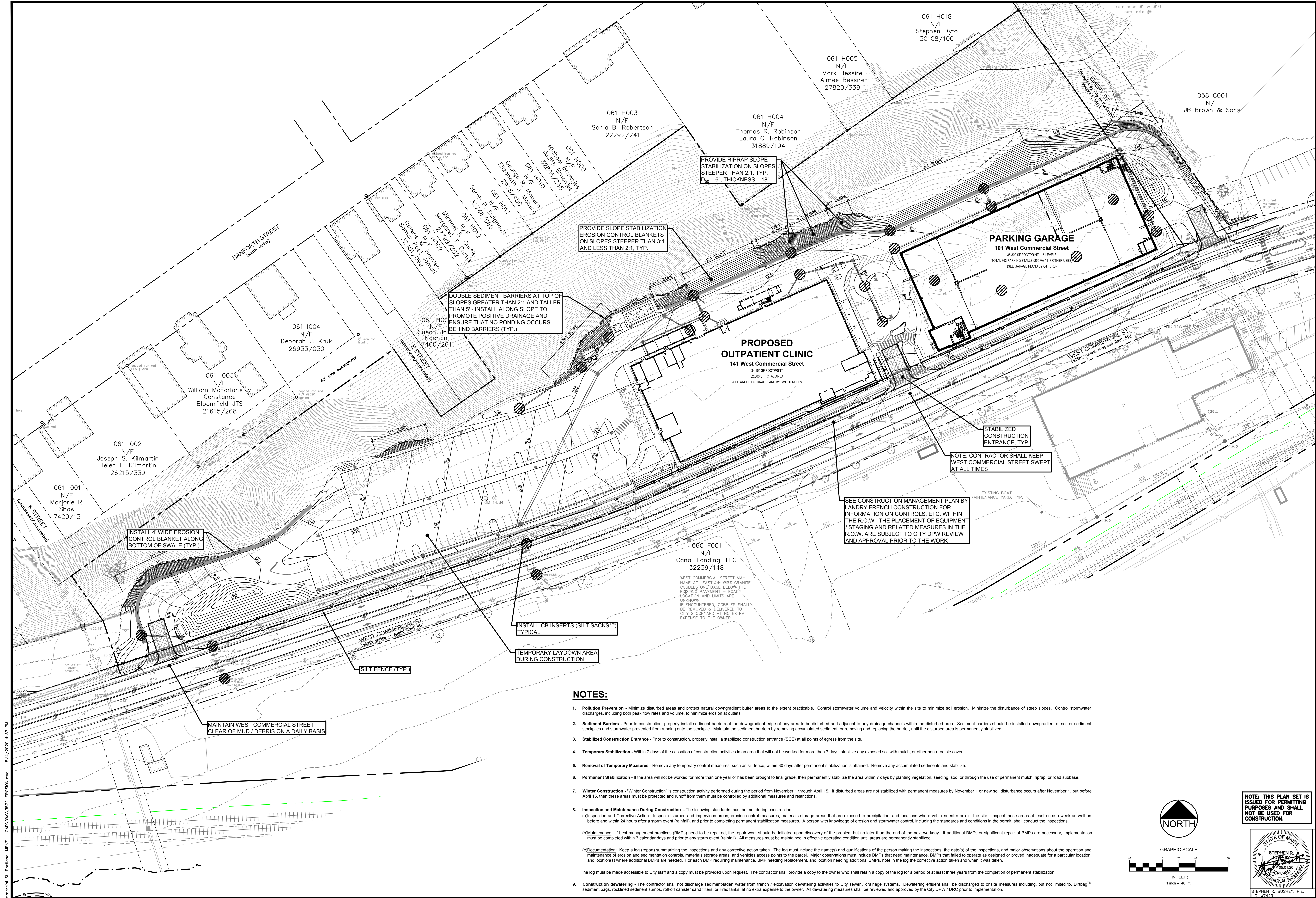
Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-grading.dwg		
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Drawing Name:	DETAILED GRADING PLANS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

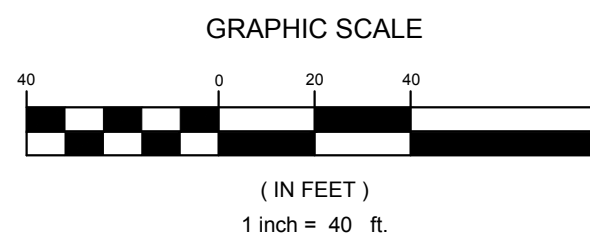
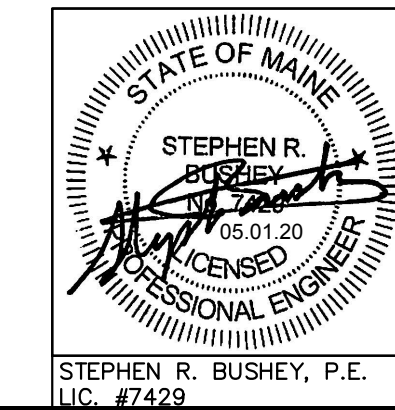
Drawing No.	C-5.5
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NOTES:

- Pollution Prevention** - Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable. Control stormwater volume and velocity within the site to minimize soil erosion. Minimize the disturbance of steep slopes. Control stormwater discharges, including both peak flow rates and volume, to minimize erosion at outlets.
- Sediment Barriers** - Prior to construction, properly install sediment barriers at the downgradient edge of any area to be disturbed and adjacent to any drainage channels within the disturbed area. Sediment barriers should be installed downgradient of soil or sediment stockpiles and stormwater prevented from running onto the stockpile. Maintain the sediment barriers by removing accumulated sediment, or removing and replacing the barrier, until the disturbed area is permanently stabilized.
- Stabilized Construction Entrance** - Prior to construction, properly install a stabilized construction entrance (SCE) at all points of egress from the site.
- Temporary Stabilization** - Within 7 days of the cessation of construction activities in an area that will not be worked for more than 7 days, stabilize any exposed soil with mulch, or other non-erodible cover.
- Removal of Temporary Measures** - Remove any temporary control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.
- Permanent Stabilization** - If the area will not be worked for more than one year or has been brought to final grade, then permanently stabilize the area within 7 days by planting vegetation, seeding, sod, or through the use of permanent mulch, riprap, or road subbase.
- Winter Construction** - "Winter Construction" is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.
- Inspection and Maintenance During Construction** - The following standards must be met during construction:
(a) **Inspection and Corrective Action** - Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
(b) **Maintenance** - If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of 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.
(c) **Documentation** - Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.
The log must be made accessible to City staff and a copy must be provided upon request. The contractor shall provide a copy to the owner who shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.
- Construction dewatering** - The contractor shall not discharge sediment-laden water from trench / excavation dewatering activities to City sewer / drainage systems. Dewatering effluent shall be discharged to onsite measures including, but not limited to, Dirtbag™ sediment bags, rock-lined sediment sumps, roll-off canister sand filters, or Frac tanks, at no extra expense to the owner. All dewatering measures shall be reviewed and approved by the City DPW / DRC prior to implementation.

NOTE: THIS PLAN SET IS
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Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.23.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-EROSION.dwg		
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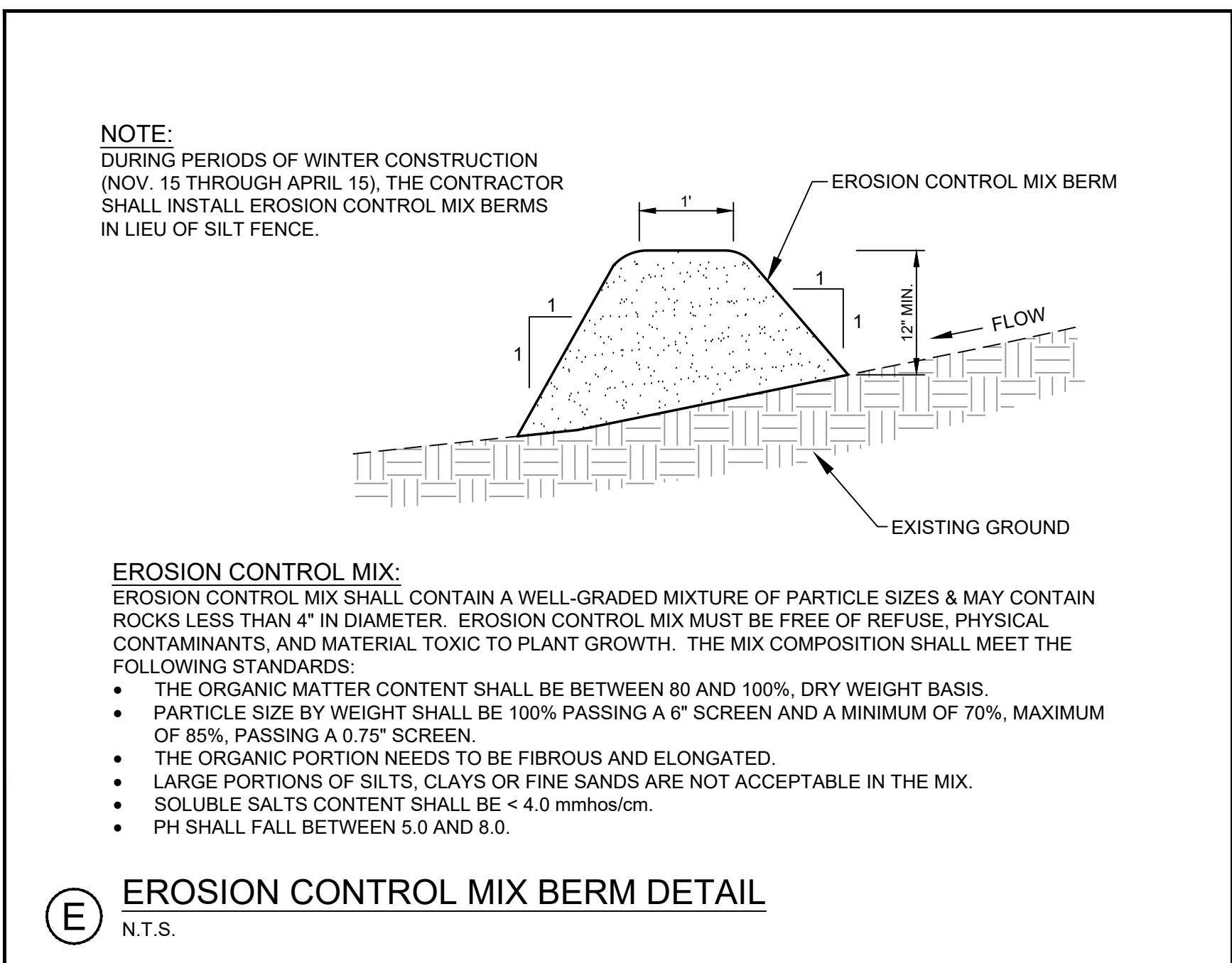
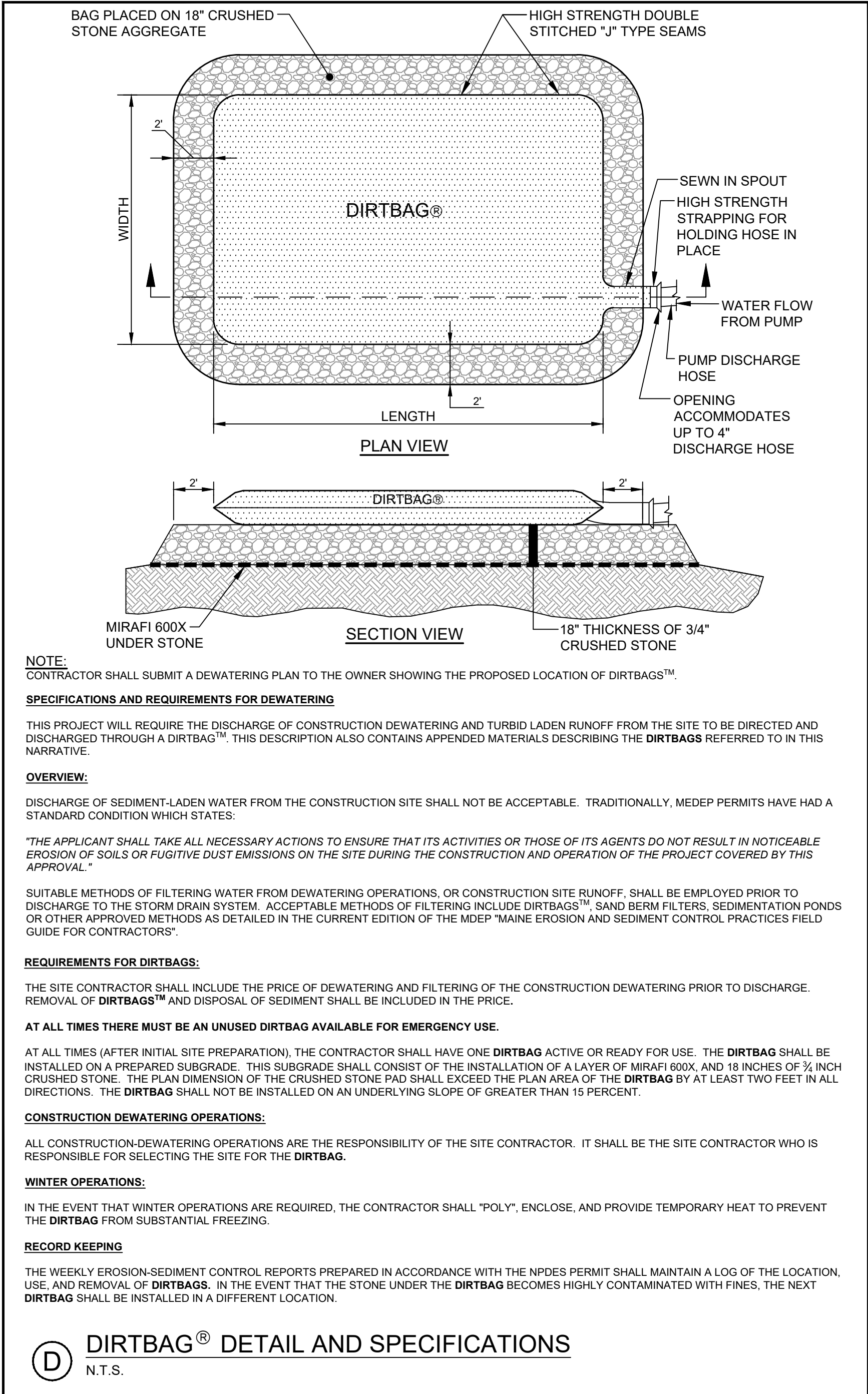
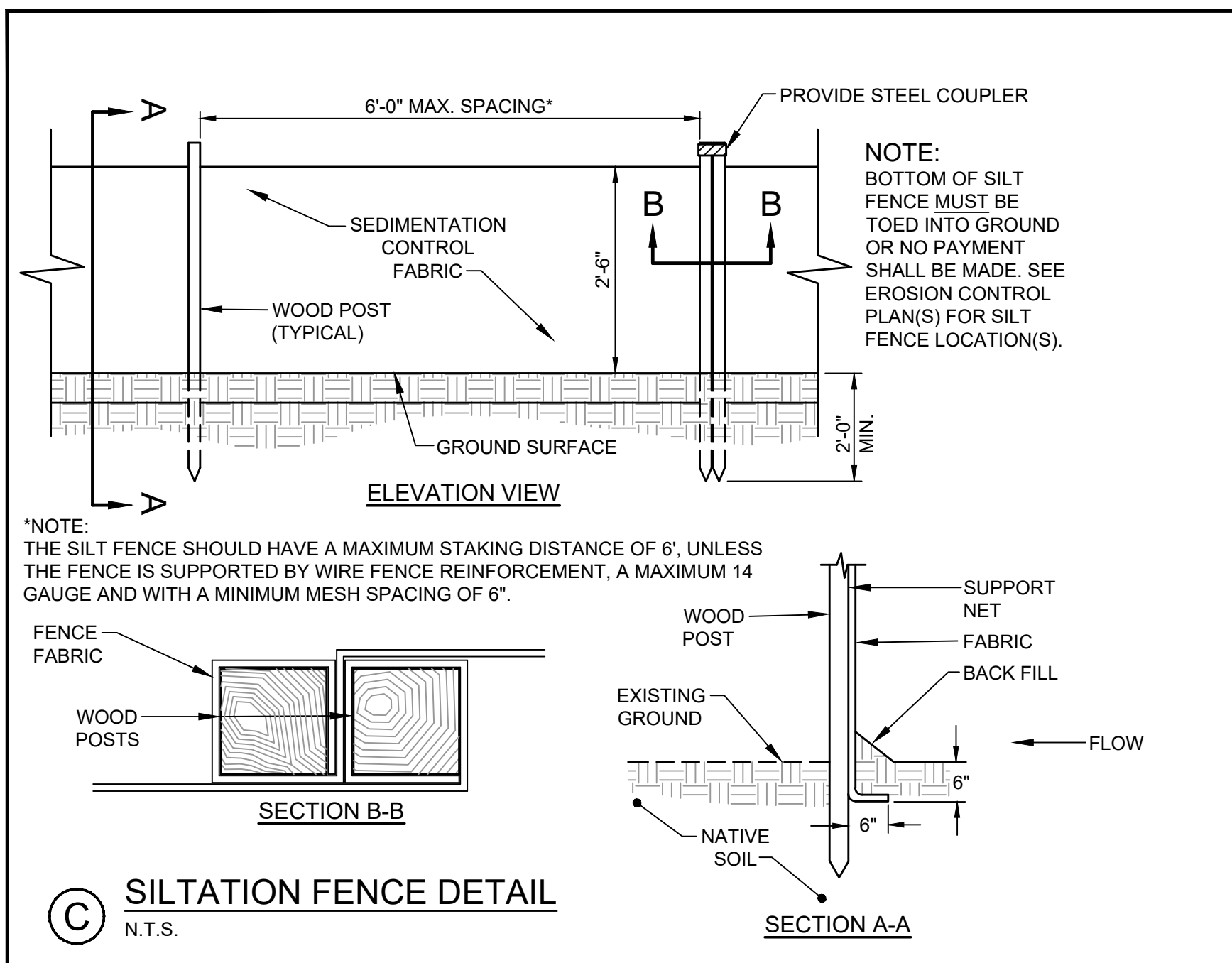
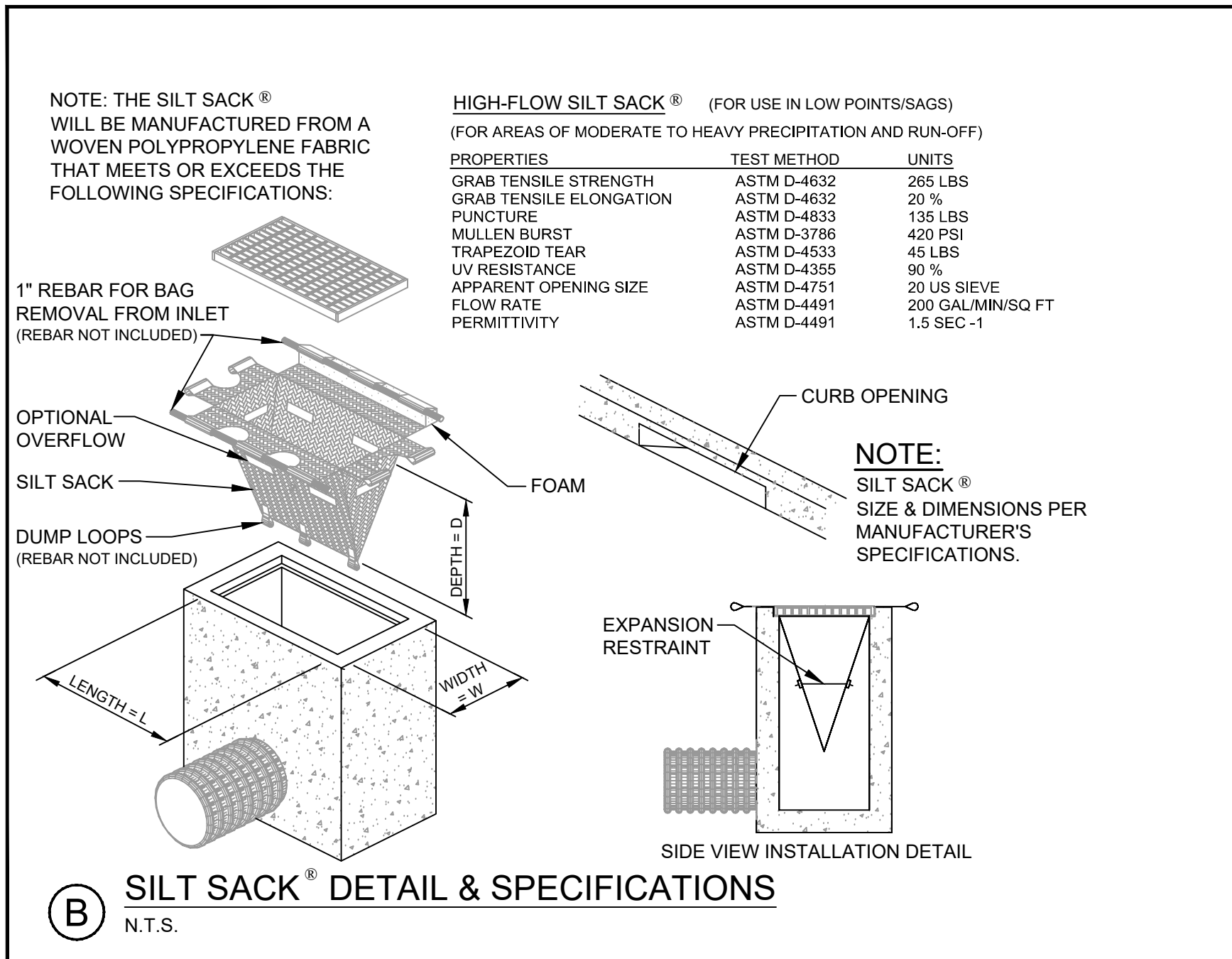
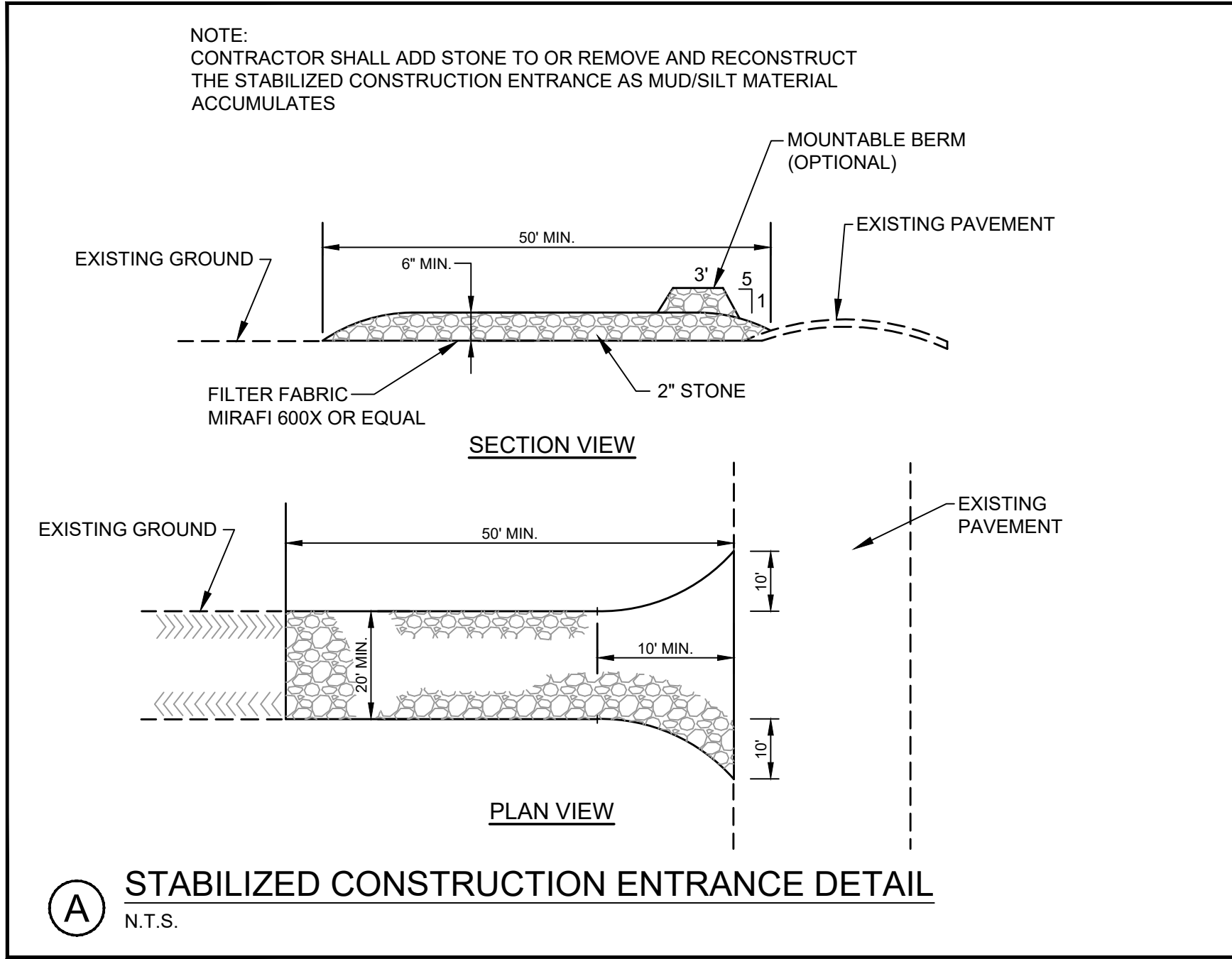


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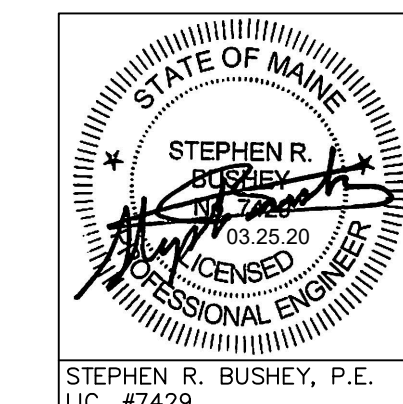
Drawing Name:	EROSION & SEDIMENT CONTROL PLAN
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-5.3
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Rev.	Date	Revision
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Released To	Date	By
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		

Design: SRB	Draft: CBD	Date: NOV. 2019
Checked: SRB	Scale: NTS	Job No.: 3572
File Name: 3572-DETAILS.dwg		
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Drawing Name:	EROSION CONTROL DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-10.5
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I.3.5 Erosion Control Measures and Site Stabilization

The primary emphasis of the erosion/sedimentation control plan, which will be implemented for this project, is as follows:

- Development of a careful construction sequence.
- Rapid revegetation of denuded areas to minimize the period of soil exposure.
- Rapid stabilization of drainage paths to avoid rill and gully erosion.
- The use of on-site measures to capture sediment (hay baled/ stone check dams/silt fence, etc.)

The following temporary and permanent erosion and sediment control devices will be implemented as part of the site development. These devices shall be installed as indicated on the plans or as described within this report. For further reference, see the latest edition of the Maine Erosion and Sediment Control Practices Field Guide for Contractors.

A. Dewatering

Water from construction trench dewatering shall pass first through a filter bag or secondary containment structure (e.g. hay bale lined pool) prior to discharge. The discharge site shall be selected to avoid flooding, icing, and sediment discharges to a protected resource. In no case shall the filter bag or containment structure be located within 50 feet of a protected natural resource. Dewatering discharge shall not be directed across adjacent properties in a concentrated manner.

B. Inspection and Monitoring

Maintenance measures shall be applied as needed during the entire construction season. After each rainfall, snow storm or period of thawing and runoff, the site contractor shall perform a visual inspection of all installed erosion control measures and perform repairs as needed to insure their continuous function. Following the temporary and/or final seeding and mulching, the contractor shall in the spring inspect and repair any damages and/or unestablished spots. Established vegetative cover means a minimum of 90% of areas vegetated with vigorous growth.

The following standards must be met during construction.

(a) **Inspection and corrective action.** Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.

(b) **Maintenance.** If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of 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.

(c) **Documentation.** Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the dates of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

The log must be made accessible to City staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

C. Temporary Erosion Control Measures

Temporary erosion control measures shall be installed by the Contractor as required by this report and as shown on the plan set for the project. Additional erosion control measures shall be installed if deemed necessary by on-site inspections of the Owner, the City of Portland, MDEP, or their representatives at no additional cost to the Owner.

The following measures are planned as temporary erosion/sedimentation control measures during construction:

1. Crushed stone-stabilized construction entrance shall be placed at any truck entrance to the project site from West Commercial Street.
2. Siltation fence or wood waste compost berms shall be installed downstream of any disturbed areas to trap runoff-borne sediments until grass areas are revegetated. The silt fence and/or wood waste compost berms shall be installed per the details provided in this package and inspected at least once a week and before and immediately after a storm event of 0.5 inches or greater, and at least daily during prolonged rainfall. Repairs shall be made if there are any signs of erosion or sedimentation below the fence or berm line. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind the fence or berm, the barrier shall be replaced with a stone check dam. Wood waste compost berms are not to be used adjacent to wetland areas that are not to be disturbed.
3. Straw or hay mulch including hydroseeding is intended to provide cover for denuded or seeded areas until revegetation is established. Mulch placed between April 15th and October 15th on slopes of less than 15 percent shall be anchored by applying water; mulch placed on slopes of equal to or steeper than 15 percent shall be covered by a fabric netting and anchored with staples in accordance with manufacturer's recommendation. Mulch placed between October 15th and April 15th on slopes equal to or steeper than 8 percent shall be covered with a fabric netting and anchored with staples in accordance with the manufacturer's recommendations. Slopes steeper than 3:1 and equal to or flatter than 2:1, which are to be revegetated, shall receive curlex blankets by American Excelcor or equal. Slopes steeper than 2:1 shall receive riprap as noted on the plans. The mulch application rate for both temporary and permanent seeding is 75 lbs per 1000 sf as identified in the seeding plan. Mulch shall not be placed over snow.
4. Temporary stockpiles of stumps, grubblings, or common excavation will be protected as follows:
 - a) Temporary stockpiles shall not be located within 100 feet of any wetlands which will not be disturbed and shall be located away from drainage swales.
 - b) Stockpiles shall be stabilized within 7 days by either temporarily seeding the stockpile by a hydroseed method containing an emulsified mulch tackifier or by covering the stockpile with mulch, such as hay, straw, or erosion control mix.
 - c) Stockpiles shall be surrounded by sedimentation barrier at the time of formation.
5. For work, which is conducted between October 15th and April 15th of any calendar year, all denuded areas, shall be covered with hay mulch or erosion control mix, applied at twice the normal application rate and anchored with a fabric netting. The time period for applying mulch shall be limited to 2 days for all areas.
6. The paved access drives shall be swept to control mud and dust as necessary. Additional stone shall be added to the stabilized construction entrance to minimize the tracking of material off the site and onto the surrounding roadways.
7. During grubbing operations stone check dams shall be installed at any evident concentrated flow discharge points and as directed on the Erosion Control Plans.
8. Silt fencing with a maximum stake spacing of 6 feet shall be used, unless the fence is supported by wire fence reinforcement of minimum 14 gauge and with a maximum mesh spacing of 6 inches, in which case stakes may be spaced a maximum of 10 feet apart. The bottom of the fence shall be anchored. A double row of silt fence shall be used adjacent to wetlands.
9. Wood waste compost/bark berms may be used in lieu of siltation fencing. Berms shall be removed and spread in a layer not to exceed 3" thick once upstream areas are completed and a 90% catch of vegetation is attained.
10. Storm drain catch basin inlet protection shall be provided through the use of stone sediment barriers or approved sediment bags (such as Silt Sacks). Installation details are provided in the plan set. The barriers shall be inspected after each rainfall and repairs made as necessary. Sediment shall be removed and the barrier restored to its original dimensions when the sediment has accumulated to ½ the design depth of the barrier. The barrier shall be removed when the tributary drainage area has been stabilized.
11. Water and/or calcium chloride shall be furnished and applied in accordance with MDOT specifications - Section 637 - Dust Control.

D. Permanent Erosion Control Measures

The following permanent erosion control measures have been designed as part of the Erosion/Sedimentation Control Plan:

1. All areas disturbed during construction, but not subject to other restoration (paving, riprap, etc.) will be loamed, limed, fertilized, mulched, and seeded. Fabric netting, anchored with staples, shall be placed over the mulch in areas as noted in **Temporary Erosion Control Measures** paragraph 3 of this report. Native topsoil shall be stockpiled and reused for final restoration when it is of sufficient quality.
2. Catch basins shall be provided with sediment sumps and inlet hoods (the Snoud) for all outlet pipes that are 18" in diameter or less.

I.4 Implementation Schedule

The following construction sequence shall be required to ensure the effectiveness of the erosion and sedimentation control measures are optimized:

It is anticipated that construction of the VA Clinic, Parking Garage and related infrastructure will commence in Spring of 2020 and be completed by Winter of 2021.

Note: For all grading activities, the contractor shall exercise extreme caution not to overexpose the site, this shall be accomplished by limiting the disturbed area.

1. Install stabilized construction entrance at any truck entrance to the project site from West Commercial Street.
2. Install perimeter silt fence and/or wood waste berms prior to grubbing respective areas.
3. Remove and reset existing utilities in Right-of-Way.
4. Clear and grub site. Install stone check dams at any evident concentrated flow discharge points.
5. Commence cut slope installation of Retaining Wall. Install diversion berms at top of slopes.
6. Foundation area shall be excavated for installation of the building footings. Building work will be on going through the remainder of the project.
7. Commence installation of drainage appurtenances.
8. Commence earthwork and grading to subgrade.
9. Commence installation of water and sewer lines.
10. Continue earthwork and grading to subgrade as necessary for construction.
11. Complete installation of underground utilities within 5' of the buildings.
12. Install light pole foundations and light poles.
13. Complete remaining earthwork operations.
14. Complete installation of catch basins and appurtenances.
15. Install sub-base and base gravel within parking fields, walkways, and all driveways.
16. Install curbing in parking fields, driveways, and along the streets as needed.
17. Install base course paving for access drive and parking area as well as concrete surfaces.
18. Loam, lime, fertilize, seed and mulch disturbed areas and complete all landscaping.
19. Install surface course paving for access drive and parking areas. Stripe per plan.

20. Once the site is stabilized and a 90% catch of vegetation has been obtained, remove all temporary erosion control measures.
21. Touch up loam and seed.

Note: All denuded areas not subject to final paving, riprap, or gravel shall be revegetated.

Prior to construction of the project, the contractor shall submit to the owner a schedule for the completion of the work, which will satisfy the following criteria:

1. The above construction sequence should generally be completed in the specified order; however, several separate items may be constructed simultaneously. Work must also be scheduled or phased to reduce the extent of the exposed areas as specified below. The intent of this sequence is to provide for erosion control and to have structural measures such as silt fence and construction entrances in place before large areas of land are denuded.
2. The work shall be conducted in sections which shall:
 - a) Limit the amount of exposed area to those areas in which work is expected to be undertaken during the proceeding 30 days.
 - b) Revegetate disturbed areas as rapidly as possible. All areas shall be permanently stabilized within 7 days of final grading or before a storm event.
 - c) Incorporate planned inlets and drainage system as early as possible into the construction phase. The ditches at the toe of cut slope shall be immediately lined or revegetated as soon as their installation is complete.

1.5 Erosion, Sedimentation and Stabilization Control Plan

The Erosion Control Plan is included in the plan set.

1.6 Details and Specifications

The Erosion Control details and specifications are included in the plan set.

1.7 Winter Stabilization Plan

The winter construction period is from November 1 through April 15. If the construction site is not stabilized with pavement, a road gravel base, 75% mature vegetation cover with riprap or 15 other site specific measures for over-winter stabilization. An area considered open is any area not stabilized with pavement; excavation, mulching, erosion control mats, riprap or gravel base on a road, drive aisle, or parking lot.

Winter vegetation and earthwork shall be completed such that any area left exposed can be controlled by the contractor. Limit the exposed area to those areas in which work is expected to be under taken during the proceeding 15 days and that can be mulched in one day prior to any snow event.

All areas shall be considered to be denuded until the subbase gravel is installed in roadway/parking areas or the areas of future loam and seed have been loamed, seeded and mulched. Hay and straw mulch rate shall be a minimum of 150 lbs./1,000 s.f. (3 tons/acre) and shall be properly anchored.

The contractor shall install any added measures which may be necessary to control erosion/sedimentation from the site dependent upon the actual site and weather conditions. Continuation of earthwork operations on additional areas shall not begin until the exposed soil surface on the area being worked has been stabilized, in order to minimize areas without erosion control protection.

1. **Soil Stockpiles**
Stockpiles of soil or subsoil shall be mulched for over winter protection with hay or straw at twice the normal rate or at 150 lbs/1,000 s.f. (3 tons per acre) or with a four-inch layer of woodwaste erosion control mix. This shall be done within 24 hours of stocking and re-established prior to any rainfall or snowfall.

2. **Natural Resource Protection**
Any areas within 100 feet from any natural resources, if not stabilized with a minimum of 75% mature vegetation catch, shall be mulched by December 1 and anchored with plastic netting or protected with erosion control mats. During winter construction, a double line of sediment barriers (i.e. silt fence backed with hay bales or erosion control mix) shall be placed between any natural resource and the disturbed area. Projects crossing the natural resource shall be protected a minimum distance of 100 feet on either side from the resource. Existing projects not stabilized by December 1 shall be protected with the second line of sediment barrier to ensure functionality during the spring thaw and rains.

3. **Sediment Barriers**
During frozen conditions, sediment barriers shall consist of woodwaste filter berms as frozen soil prevents the proper installation of hay bales and sediment silt fences.

4. **Mulching**
An area shall be considered denuded until areas of future loam and seed have been loamed, seeded and mulched. Hay and straw mulch shall be applied at a rate of 150 lb. per 1,000 square feet or 3 tons/acre (twice the normal application rate of 75 lbs./1,000 s.f. or 1.5 tons/acre) and shall be properly anchored. Mulch shall not be spread on top of snow. The snow shall be removed down to a one-inch depth or less prior to application. After each day of final grading, the area shall be properly stabilized with anchored hay or straw or erosion control matting. An area shall be considered to have been stabilized when exposed surfaces have been either mulched with straw or hay at a rate of 150 lb. per 1,000 square feet (3 tons/acre) and adequately anchored that ground surface is not visible through the mulch.

Between the dates of November 1 and April 15, all mulch shall be anchored by peg line, mulch netting, asphalt emulsion chemical, or wood cellulose fiber. When ground surface is not visible through the mulch then cover is sufficient. After November 1st, mulch and anchoring of all bare soil shall occur at the end of each final grading workday.

5. **Mulching on Slopes and Ditches**
Slopes shall not be left exposed for any extended time of work suspension unless fully mulched and anchored with peg and netting or with erosion control blankets. Mulching shall be applied at a rate of 230 lbs/1,000 s.f. on all slopes greater than 8%.

Mulch netting shall be used to anchor mulch in all drainage ways with a slope greater than 3% for slopes exposed to direct winds and for all other slopes greater than 8%. Erosion control blankets shall be used in lieu of mulch in all drainage ways with slopes greater than 8%. Erosion control mix can be used to substitute erosion control blankets on all slopes except ditches.

6. **Seeding**
Between the dates of October 15 and April 1st, loam or seed will not be required. During periods of above freezing temperatures finished areas shall be fine graded and either protected with mulch or temporarily seeded and mulched until such time as the final treatment can be applied. If the date is after November 1st and if the exposed area has been loamed, final graded with a uniform surface, then the area may be dormant seeded at a rate of 3 times higher than specified for permanent seed and then mulched. Dormant seeding may be selected to be placed prior to the placement of mulch and fabric netting anchored with staples. If dormant seeding is used for the site, all disturbed areas shall receive 4" of loam and seed at an application rate of 5 lbs/1,000 s.f. All areas seeded during the winter shall be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 75% catch) shall be revegetated by replacing loam, seed and mulch. If dormant seeding is not used for the site, all disturbed areas shall be revegetated in the spring.

Standards for Timely Stabilization of Construction Sites During Winter

1. **Standard for the timely stabilization of ditches and channels** -- The applicant shall construct and stabilize all stone-lined ditches and channels on the site by November 15. The applicant shall construct and stabilize all grass-lined ditches and channels on the site by September 1. If the applicant fails to stabilize a ditch or channel to be grass-lined by September 1, then the applicant will take one of the following actions to stabilize the ditch for late fall and winter.

Install a sod lining in the ditch -- The applicant shall line the ditch with properly installed sod by October 1. Proper installation includes the applicant pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, watering the sod to promote root growth into the disturbed soil, and anchoring the sod with jute or plastic mesh to prevent the sod strips from sloughing during flow conditions.

Install a stone lining in the ditch --The applicant shall line the ditch with stone riprap by November 15. The applicant shall hire a registered professional engineer to determine the stone size and thickness needed to withstand the anticipated flow velocities and flow depths within the ditch. If necessary, the applicant shall regrade the ditch prior to placing the stone lining so to prevent the stone lining from reducing the ditch's cross-sectional area.

2. **Standard for the timely stabilization of disturbed slopes** -- The applicant shall construct and stabilize stone-covered slopes by November 15. The applicant shall seed and mulch all slopes to be vegetated by September 1. The department shall consider any area having a grade greater than 15% to be a slope. If the applicant fails to stabilize any slope to be vegetated by September 1, then the applicant shall take one of the following actions to stabilize the slope for late fall and winter.

Stabilize the slope with temporary vegetation and erosion control mats -- By September 1 the applicant shall seed the disturbed slope with winter rye at a seeding rate of 3 pounds per 1,000 square feet and apply erosion control mats over the mulched slope. The applicant shall monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or cover at least 75% of the disturbed slope by November 1, then the applicant shall cover the slope with a layer of woodwaste compost as described in item iii of this standard or with stone riprap as described in item iv of this standard.

Stabilize the slope with sod -- The applicant shall stabilize the disturbed slope with properly installed sod by September 1. Proper installation includes the applicant pinning the sod onto the slope with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil. The applicant shall not use late-season sod installation to stabilize slopes having a grade greater than 33% (3H:1V).

Stabilize the slope with woodwaste compost -- The applicant shall place a six-inch layer of woodwaste compost on the slope by November 15. Prior to placing the woodwaste compost, the applicant shall remove any snow accumulation on the disturbed slope. The applicant shall not use woodwaste compost to stabilize slopes having grades greater than 50% (2H:1V) or having groundwater seeps on the slope face.

Stabilize the slope with stone riprap -- The applicant shall place a layer of stone riprap on the slope by November 15. The applicant shall hire a registered professional engineer to determine the stone size needed for stability and to design a filter layer for underneath the riprap.

3. **Standard for the timely stabilization of disturbed soils** -- By September 15 the applicant shall seed and mulch all disturbed soils on areas having a slope less than 15%. If the applicant fails to stabilize these soils by this date, then the applicant shall take one of the following actions to stabilize the soil for late fall and winter.

Stabilize the soil with temporary vegetation -- By September 1 the applicant shall seed the disturbed soil with winter rye at a seeding rate of 3 pounds per 1,000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1,000 square feet, and anchor the mulch with plastic netting. The applicant shall monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or cover at least 75% of the disturbed soil before November 1, then the applicant shall mulch the area for over-winter protection as described below.

Stabilize the soil with sod -- The applicant shall stabilize the disturbed soil with properly installed sod by September 15. Proper installation includes the applicant pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.

Stabilize the soil with mulch -- By November 15 the applicant shall mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1,000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, the applicant shall remove any snow accumulation on the disturbed area. Immediately after applying the mulch, the applicant will anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

1.8 Maintenance of facilities

The stormwater facilities will be maintained by the Applicant, JB Brown or their assigned heirs. The contract documents will require the contractor to designate a person responsible for maintenance of the sedimentation control features during construction as required by the Erosion Control Report. Long-term operation/maintenance recommended for the stormwater facilities is presented below.

The responsible party may contract with such professionals, as may be necessary in order to comply with this provision and may rely on the advice of such professionals in carrying out its duty hereunder, provided, that the following operation and maintenance procedures are hereby established as a minimum for compliance with this section. A maintenance log of the inspections shall be kept by the responsible party.

Inspection and Maintenance Frequency and Corrective Measures:

The following areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments and debris.

Catch Basins:

Inspect catch basins 2 times per year (preferably in Spring and Fall) to ensure that the catch basins are working in their intended fashion and that they are free of debris. Clean structures when sediment depths reach 12" from invert of outlet. If the basin outlets is designed with a hood to trap floatable materials (i.e. Snoud), check to ensure watertight seal is working. At a minimum, remove floating debris and hydrocarbons at the time of the inspection.

Inlet/Outlet Control Structures:

Inspect structures and piping 2 times per year (preferably in Spring and Fall) to ensure that the structures are working in their intended fashion and that they are free of debris. Remove any obstructions to flow; remove accumulated sediments and debris within the structure.

Stone Bermed Level Lip Spreaders:

Inspect 2 times per year (preferably in Spring and Fall) to ensure that they are free of debris and no undesirable growth is impeding water flow through the berm. In addition, the stone bermed level lip spreaders shall be inspected to ensure that runoff is not bypassing the bermed spreader.

Vegetated Areas:

Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. The facilities will be inspected after major storms and any identified deficiencies will be corrected.

Ditches, Swales and other Open Stormwater Channels:

Inspect 2 times per year (preferably in Spring and Fall) to ensure they are working in their intended fashion and that they are free of sediment and debris. Remove any obstructions to flow, including accumulated sediments and debris and vegetated growth. Repair any erosion of the ditch lining. Vegetated ditches will be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric, or underdrain gravel is showing through the stone or where stones have dislodged. Correct any erosion of the channel's bottom or sideslopes. The facilities shall be inspected after major storms and any identified deficiencies shall be corrected.

Roadways and Parking Surfaces: Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. 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. Repair potholes and other roadway obstructions and hazards. Plowing and sanding of paved areas shall be performed as necessary to maintain vehicular traffic safety.

Recertification

As part of the Stormwater Permit, the applicant is required to meet the standards in Appendix B of the Chapter 500 Rules. Appendix B states that a project must submit a certification of the following to the department within three months of the expiration of each five-year interval from the date of issuance of the permit. (a)Identification and repair of erosion problems. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b)Inspection and repair of stormwater control system. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

(c)Maintenance. The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department, and the maintenance log is being maintained.

(d)Proprietary Systems. All proprietary systems have been maintained according to the manufacturer's recommendations. Where required by the Department, the permittee shall execute a 5-year maintenance contract with a qualified professional for the coming 5-year interval. The maintenance contract must include provisions for routine inspections, cleaning, and general maintenance.

Housekeeping

As part of the Stormwater Permit, the applicant is required to meet the standards in Appendix C of the Chapter 500 Rules. The following procedures are hereby established as a minimum for compliance with this section. For further information on the procedures listed below, refer to Chapter 500 rules - Appendix C.

Spill Prevention:

Appropriate spill prevention, containment, and response planning/implementation shall be used to prevent pollutants from being discharged from materials on site.

Groundwater Protection:

During construction, hazardous materials with the potential to contaminate groundwater shall not be stored or handled in areas of the site which drain to an infiltration area.

Fugitive Sediment and Dust:

Appropriate measures shall be taken to ensure that activities do not result in noticeable erosion of the soils and water and/or calcium chloride shall be used to ensure that activities do not result in fugitive dust emissions during or after construction.

Debris and Materials:

Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

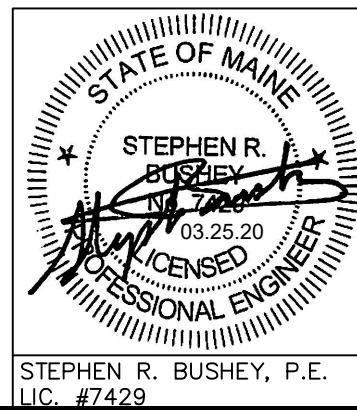
Trench or Foundation De-watering:

Water collected through the process of trenching and/or de-watering must be removed from the ponded area, and must be spread through natural wooded buffers or other areas that are specifically designed to collect the maximum amount of sediment possible.

Non-stormwater Discharges:

Identify and prevent contamination by non-stormwater discharges.

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.



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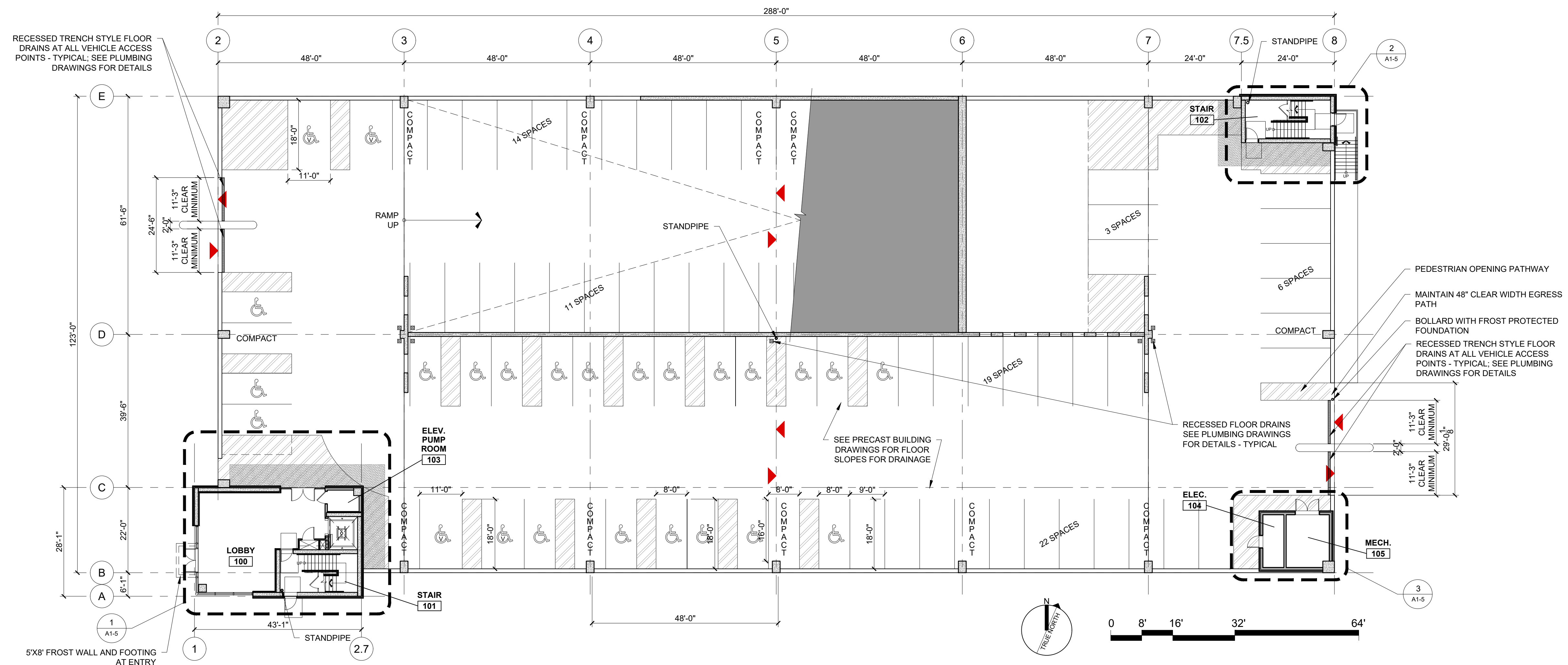
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Project: U.S. Department of Veterans Affairs – Community Based Outpatient Clinic
133 West Commercial Street, Portland, Maine

Client: FDS JBB PORTLAND, LLC
10 Free Street, Portland, Maine 04101

Drawing No.

C-10.6



1 FIRST FLOOR PLAN
1/16" = 1'-0"

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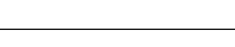
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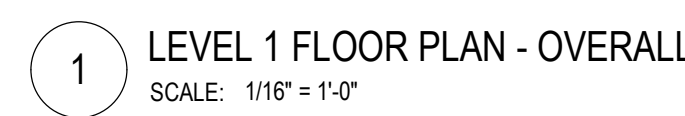


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PROJECT NUMBER

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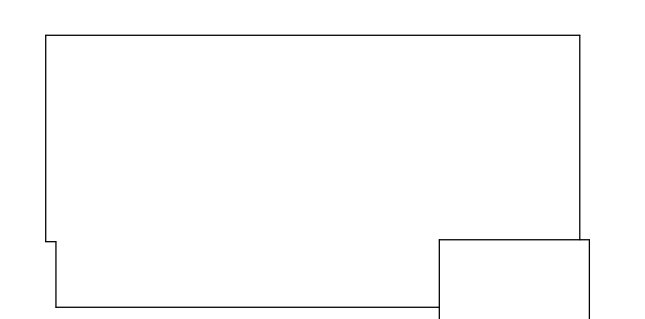
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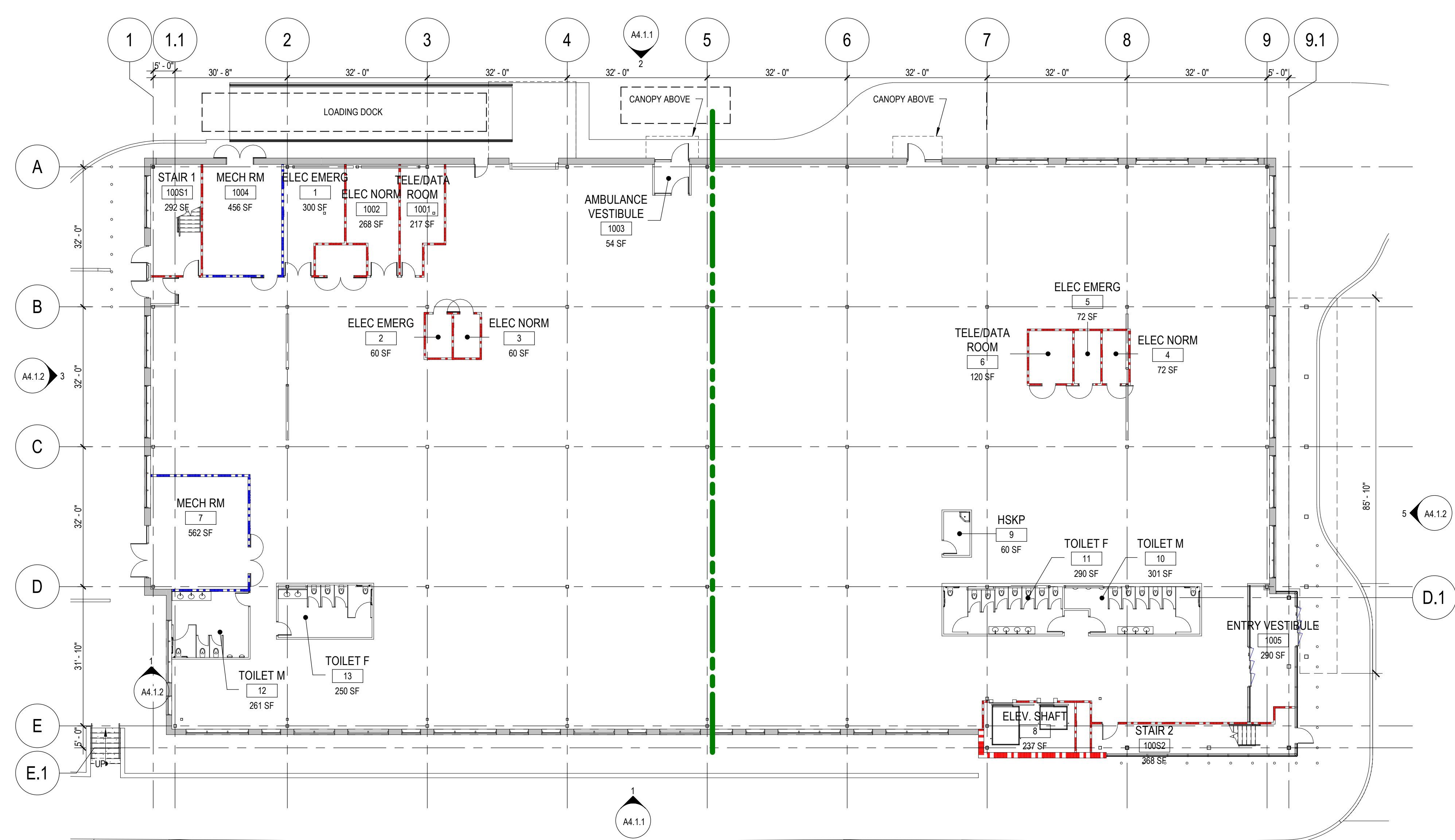
KEYPLAN



SHEET TITLE

OVERALL LEVEL 1 FLOOR
PLAN

PROJECT NUMBER **A2.1.0**

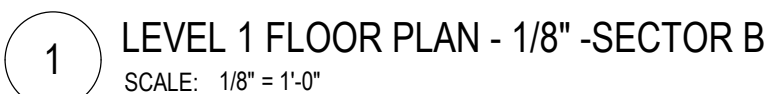


1 LEVEL 1 FLOOR PLAN - OVERALL
SCALE: 1/16" = 1'-0"



EXAMPLE:
A502 ACM PANEL JOINT
A503 ALIGN CANOPY CORNER WITH 1/2" JOINT
 SEALANT AT CURTAIN WALL MULLION

SHEET NUMBER



EXAMPLE:
A502 ACM PANEL JOINT
A503 ALIGN CANOPY CORNER WITH 1/2" JOINT
 SEALANT AT CURTAIN WALL MULLION

SHEET NUMBER

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KEYPLAN

A circular north arrow with a vertical line through the center. The word "NORTH" is written above the circle, and the arrow points towards the top right of the page.

SHEET TITLE

OVERALL LEVEL 2 FLOOR
PLAN

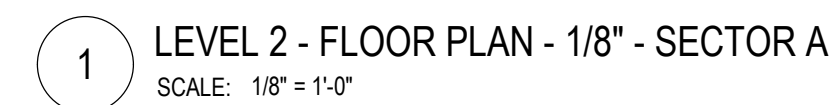
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PROJECT NUMBER

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SHEET NUMBER _____





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- C. REFER TO THE A3.X SERIES SHEETS FOR THE REFLECTED CEILING PLANS.
- D. REFER TO THE A9.2.X SERIES SHEETS FOR PARTITION SYSTEMS TYPES AND DETAILS.
- E. REFER TO THE A9.3.X SERIES SHEETS FOR THE INTERIOR OPENING SCHEDULE(S), TYPES, AND DETAILS.
- F. REFER TO THE 'AF' SERIES SHEETS FOR INTERIOR FINISH INFORMATION.
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EXAMPLE:
076200.B02 SCUPPER
088000.IGU1 INSUL LAM GLAZING UNIT

○ SHEET KEYNOTES

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EXAMPLE:
A502 ACM PANEL JOINT
A503 ALIGN CANOPY CORNER WITH 1/2" JOINT
 SEALANT AT CURTAIN WALL MULLION

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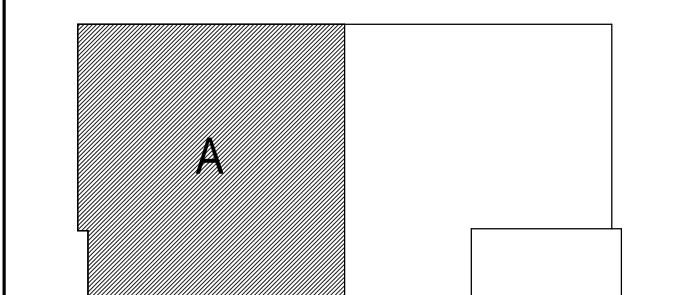
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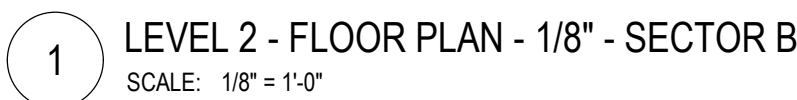
SHEET TITLE

LEVEL 2 FLOOR PLAN -
SECTOR A

PROJECT NUMBER

A2.2.1

SHEET NUMBER



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- E. REFER TO THE A.9.3.X SERIES SHEETS FOR THE INTERIOR OPENING SCHEDULE(S), TYPES, AND DETAILS.
- F. REFER TO THE "AF" SERIES SHEETS FOR INTERIOR FINISH INFORMATION.
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EXAMPLE:
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EXAMPLE:
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 SEALANT AT CURTAIN WALL MULLION

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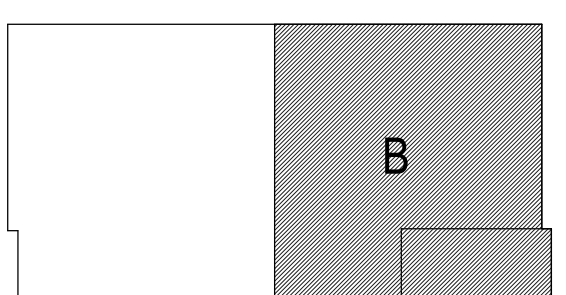
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KEYPLAN



SHEET TITLE

LEVEL 2 FLOOR PLAN -
SECTOR B

PROJECT NUMBER

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SHEET NUMBER

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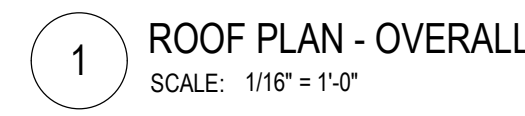
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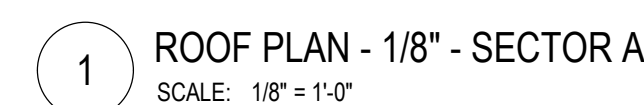


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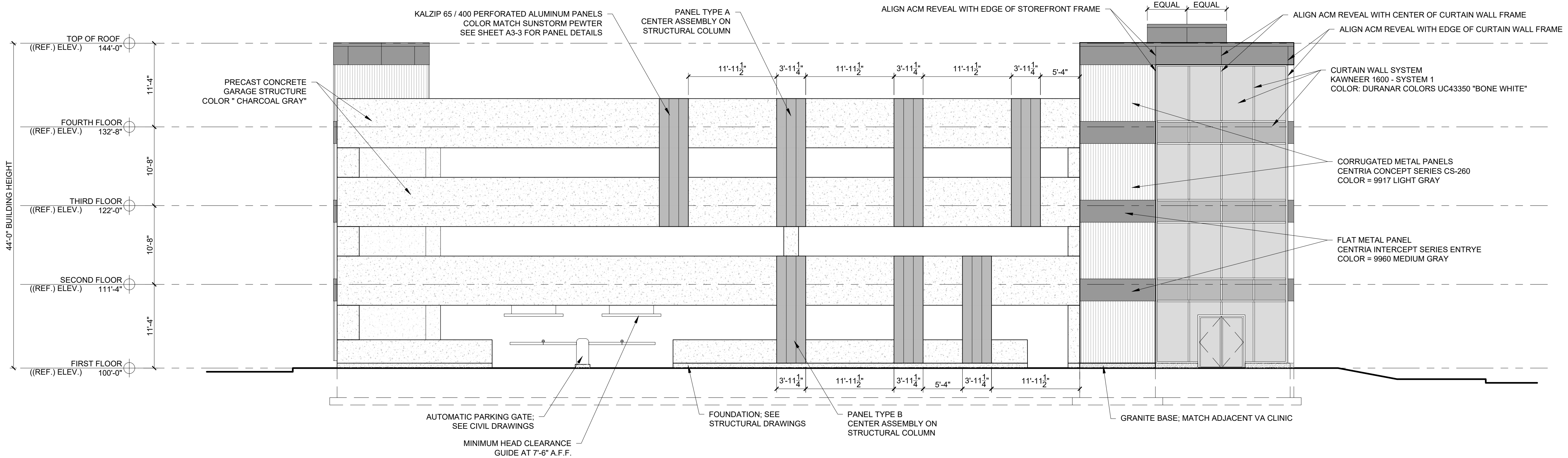
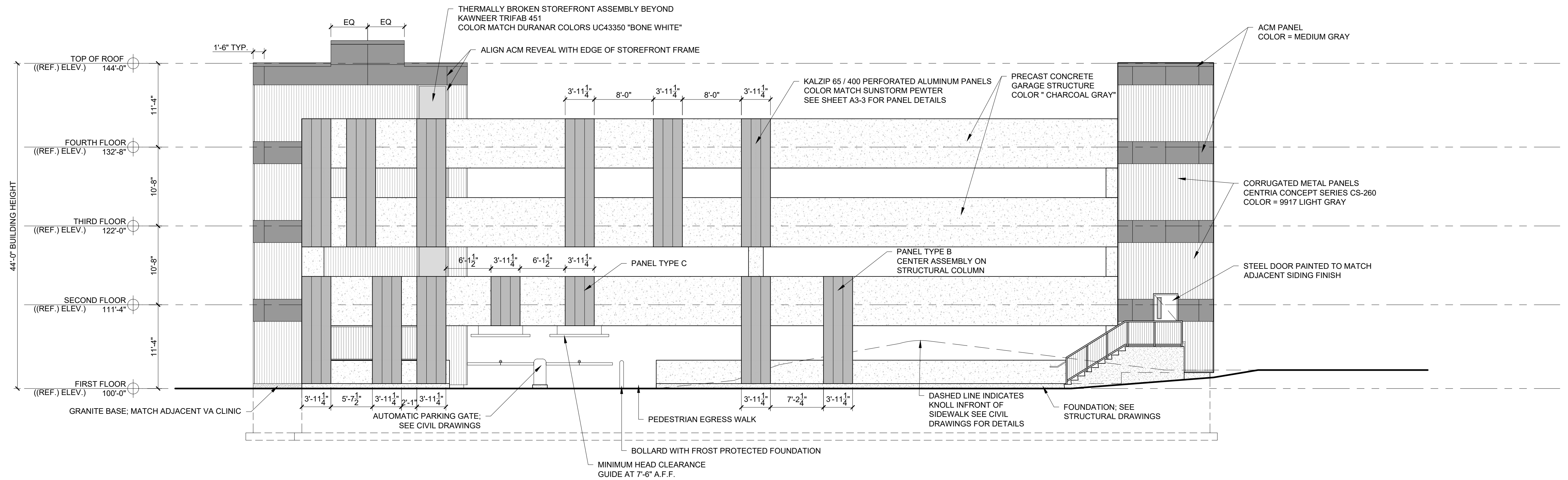
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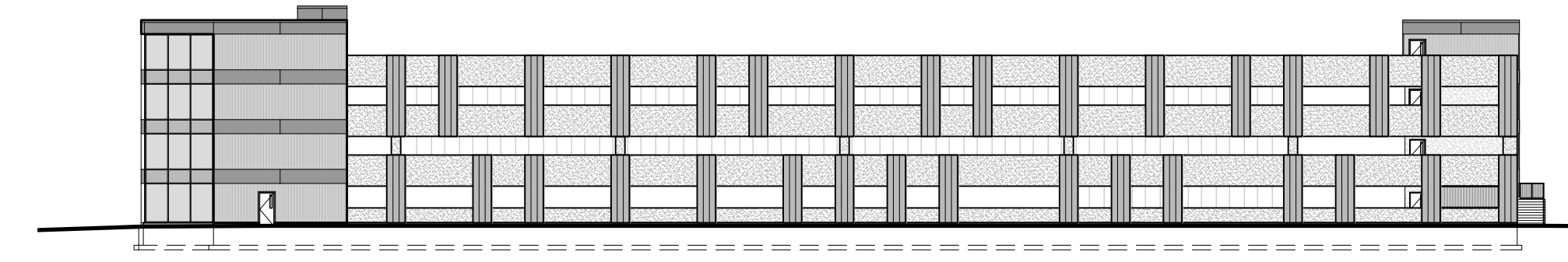
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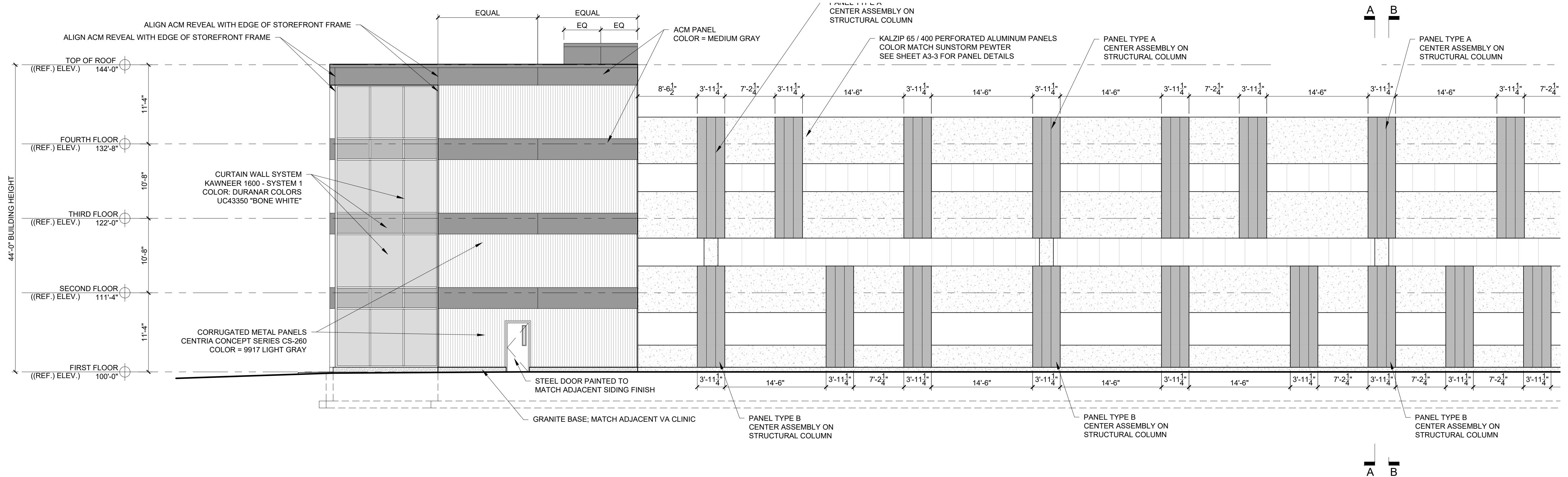


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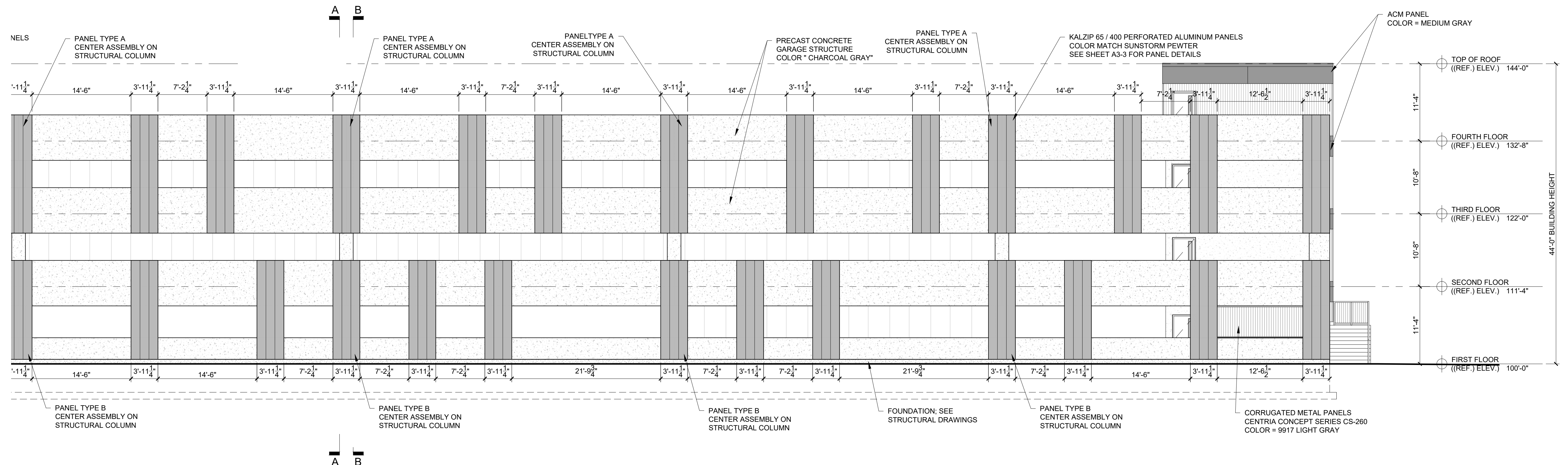




3 SOUTH EXTERIOR ELEVATION- OVERALL
1/32" = 1'-0"



1 SOUTH EXTERIOR ELEVATION- PART A
3/8" = 1'-0"



2 SOUTH EXTERIOR ELEVATION (CONT'D) - PART B
3/8" = 1'-0"

VA PARKING GARAGE
151 WEST COMMERCIAL STREET
PORTLAND, MAINE



RYAN SENATORE
ARCHITECTURE
565 CONGRESS STREET
PORTLAND, MAINE 04101
207-650-6414
senatorearchitecture.com

CONSULTANTS:

REVISIONS:
PROGRESS PRINT ONLY
Not for Construction
MARCH 23, 2020

DATE:

PROJECT No. 1969

DRAWN BY: JPF

CHECKED BY: RJS

SCALE: AS NOTED

SHEET TITLE:

EXTERIOR
ELEVATIONS

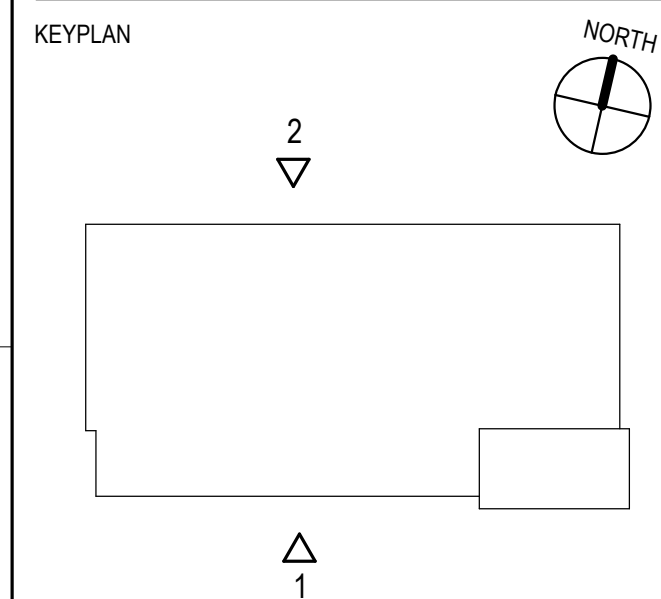
A2-1

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SEALS AND SIGNATURES

NOT FOR
CONSTRUCTION

KEYPLAN



SHEET TITLE

EXTERIOR BUILDING ELEVATIONS

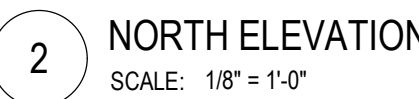
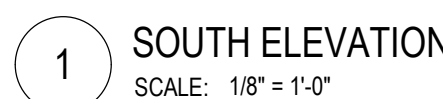
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PROJECT NUMBER

SHEET NUMBER

1186

A4.1.1



CURTAINWALL

CW-X THERMALLY BROKEN UNITIZED CURTAIN WALL SYSTEM

STOREFRONT

 **SF A, B, & C** THERMALLY BROKEN STORE-FRONT SYSTEM; "PUNCHED" WINDOWS

GLASS

GL-1		STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT
GL-1a		STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL UNIT
GL-2		STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT
GL-2a		STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL UNIT
GL-2b		STRUCTURALLY GLAZED, LOW E, THERMOSET

METAL

	MP-1	METAL PANEL - CORRUGATED, COLOR - 1
	MP-2	METAL PANEL - FLAT, COLOR - 2
	MP-3	METAL PANEL - FLAT, COLOR - 3
	MP-4	PERFORATED METAL PANEL - CORRUGATED

MASONRY & STONE

	CMU-1	CONCRETE MASONRY UNIT VENEER WALL, FINISH - 1
	CMU-2	CONCRETE MASONRY UNIT VENEER WALL FINISH - 2
	CMU-3	CONCRETE MASONRY UNIT VENEER WALL FINISH - 3
	STN-1	GRANITE, FINISH - 1

[illegible]

SEALS AND SIGNATURES

NOT FOR
CONSTRUCTION

KEYPLAN NORTH

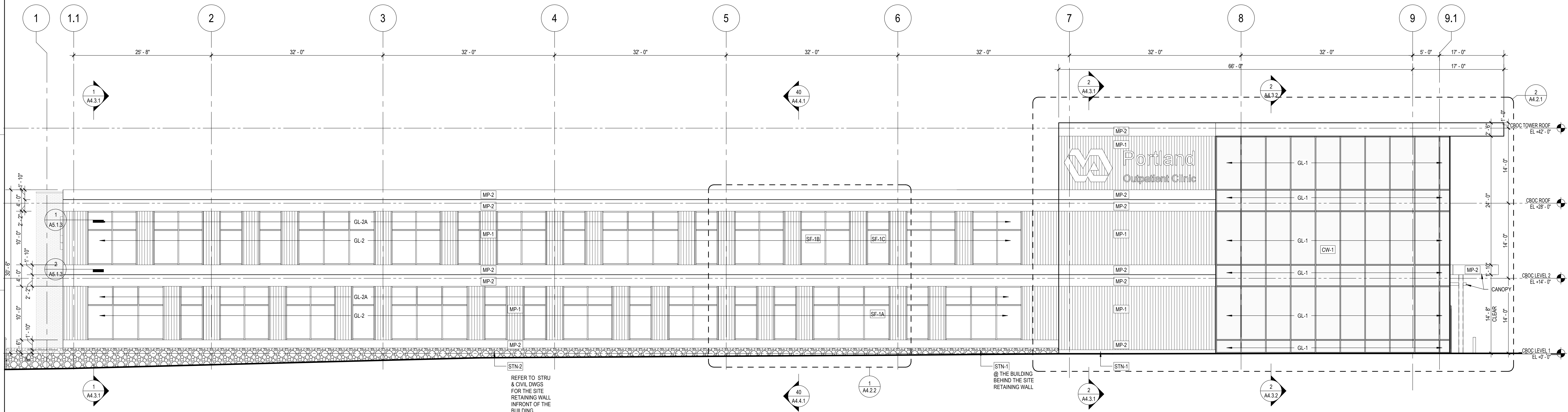
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EXTERIOR BUILDING
ELEVATIONS

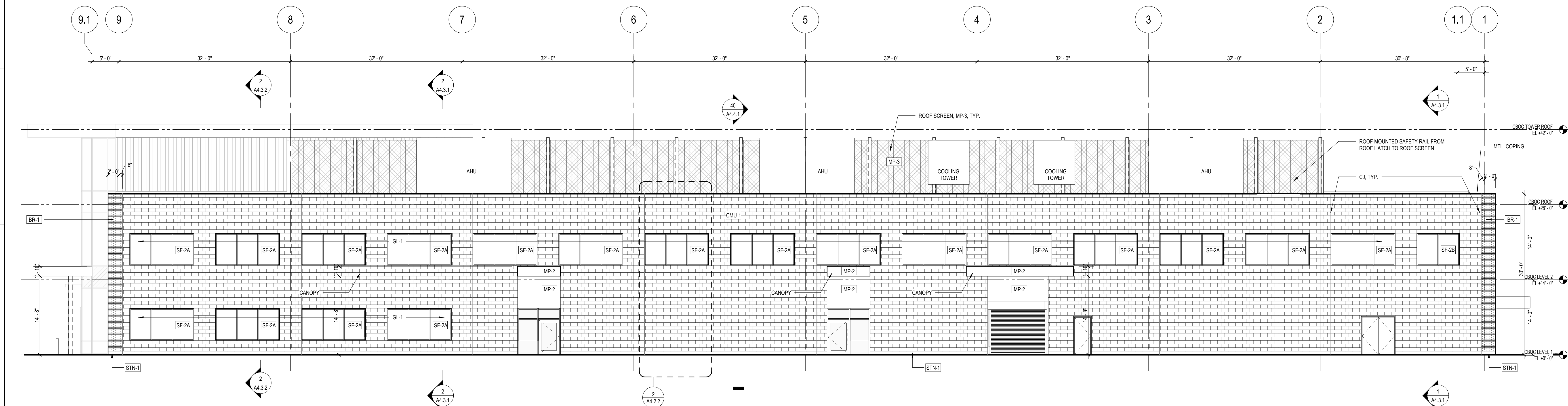
[alt. project number] 118

PROJECT NUMBER

SHEET NUMBER _____



1 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



2 NORTH ELEVATION
SCALE: 1/8" = 1'-0"

LEGENDS:

CURTAINWALL

CW-1	THERMALLY BROKEN UNITIZED CURTAIN WALL SYSTEM
CW-1A	UNITIZED CURTAIN WALL SYSTEM

CW-1A UNITIZED CURTAIN WALL SYSTEM

STOREFRONT

SF-1 THERMALLY BROKEN STORE-FRONT SYSTEM: TUNCHED WINDOWS

SF-2 THERMALLY BROKEN STORE-FRONT SYSTEM: "PUNCHED" WINDOWS

GLASS

GL-1	STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT
------	--

GL-1A STRUCTURALLY GLAZED, LOW E, SPANDREL/INCH UNIT

[illegible]

GL-2A	STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL. UNIT
-------	--

METAL

	MP-1	COMPOSITE METAL PANEL - CORRUGATED, COLOR - 1
---	-------------	--

	MP-2	COMPOSITE METAL PANEL - FLAT, COLOR - 2
--	------	--

☐ *Other (please specify):* _____

MASONRY & STONE

BR-1 BRICK VENEER WALL, COMPOSITION - 1

	CMU-1	CONCRETE MASONRY UNIT VENEER (HALL, BRICK 4)
--	--------------	---

STN-2 GRANITE, FINISH - 2

SEALS AND SIGNATURES

NOT FOR
CONSTRUCTION

KEYPLAN



Diagram of a rectangular channel with a bottom step. The channel has a total width of 10 ft. The bottom is at elevation 100 ft for the left part and 95 ft for the right part. Water is flowing from left to right. At section 1 (left), the water surface is at elevation 105 ft and the bottom is at 100 ft. At section 2 (right), the water surface is at elevation 102 ft and the bottom is at 95 ft. The flow is subcritical at both sections.

SHEET TITLE

EXTERIOR BUILDING ELEVATIONS

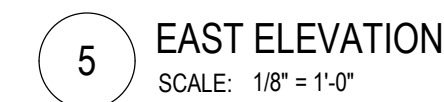
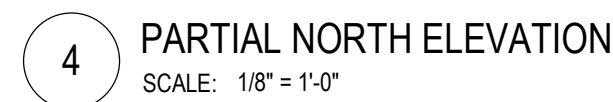
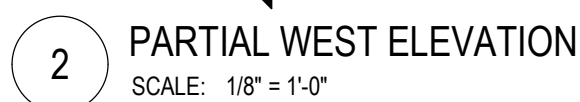
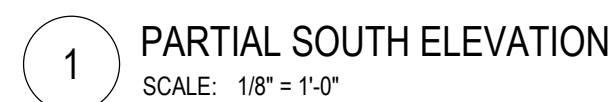
[alt. project number]

11865

PROJECT NUMBER

A4.1.2

SHEET NUMBER



CURTAINWALL

STOREFRONT

GLASS

GL-2b STRUCTURALLY GLAZED, LOW E

METAL

MASONRY & STONE

	STN-1	GRANITE, FINISH - 1
--	-------	---------------------

[illegible]

SEALS AND SIGNATURES

NOT FOR
CONSTRUCTION

KEYPLAN



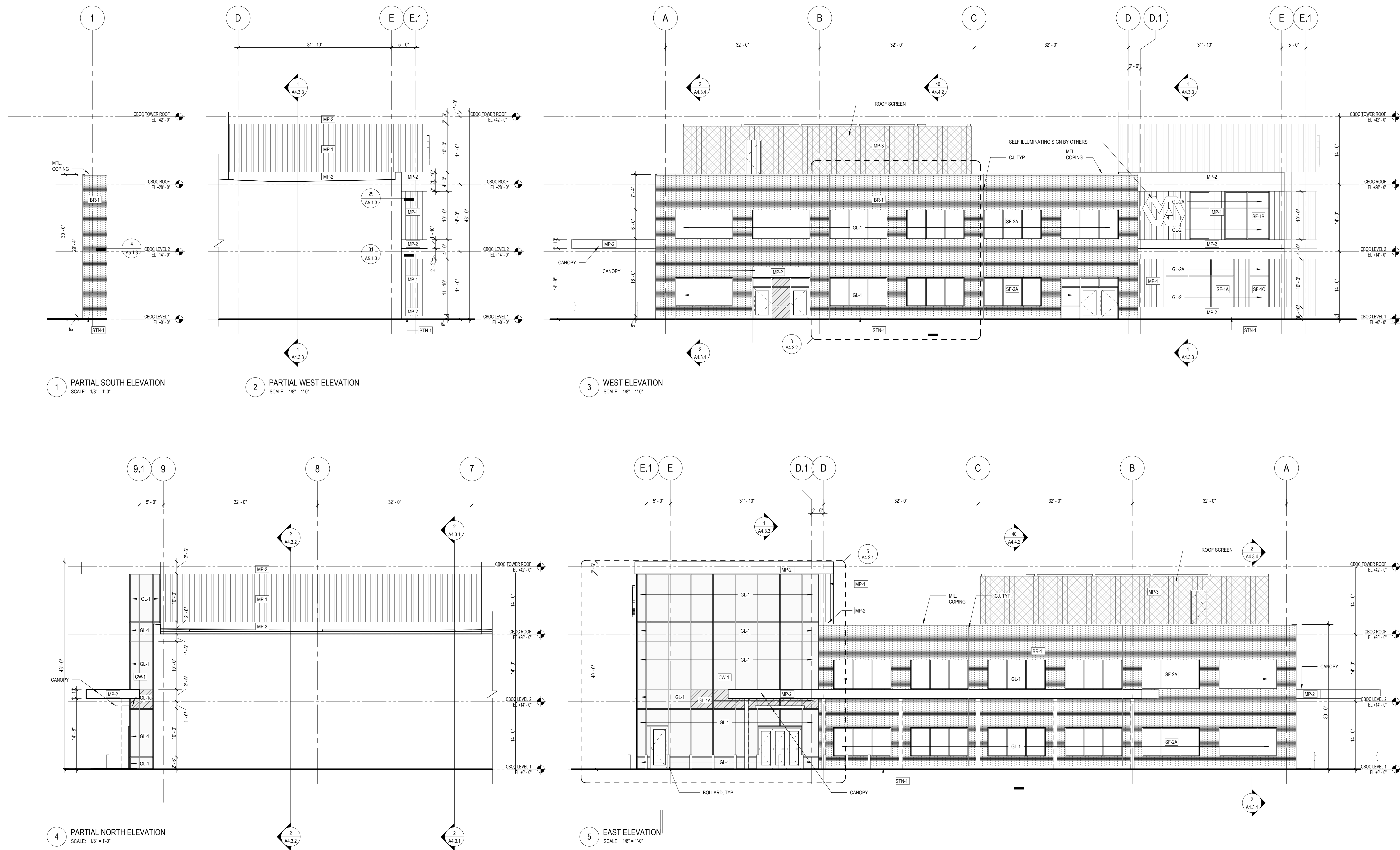
SHEET TITLE

EXTERIOR BUILDING
ELEVATIONS

[alt. project number] 118

PROJECT NUMBER _____

SHEET NUMBER



LEGENDS:

CURTAINWALL

CW-1	THERMALLY BROKEN UNITIZED CURTAIN WALL SYSTEM
CW-1A	UNITIZED CURTAIN WALL SYSTEM

STOREFRONT

SF-1	THERMALLY BROKEN STORE-FRONT SYSTEM; "PUNCHED" WINDOWS
SF-2	THERMALLY BROKEN STORE-FRONT SYSTEM; "PUNCHED" WINDOWS

GLASS

	GL-1	STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT
---	------	---

	GL-1A	STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL UNIT
---	--------------	---

	GL-2	STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT
---	-------------	---

	GL-2A	STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL. UNIT
--	-------	--

METAL

 MP-1 COMPOSITE METAL PANEL - CORRUGATED,
COLOR - 1

 MP-2 COMPOSITE METAL PANEL - FLAT,
COLOR - 2

	MP-3	PERFORATED MTAL PANEL - CORRUGATED, COLOR - 3
--	-------------	--

MASONRY & STONE

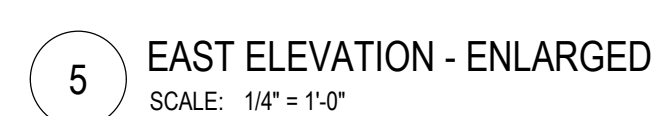


BR-1 BRICK VENEER WALL, COMPOSITION -

	CMU-1	CONCRETE MASONRY UNIT VENEER WALL, FINISH - 1
---	--------------	--

 STN-1 GRANITE FINISH - 1

STN-2 GRANITE, FINISH - 2

SEALS AND SIGNATURES

LJB Inc.
STRUCTURAL
2500 NEWMARK DRIVE
MIAMISBURG, OH 45342
937.259.5000

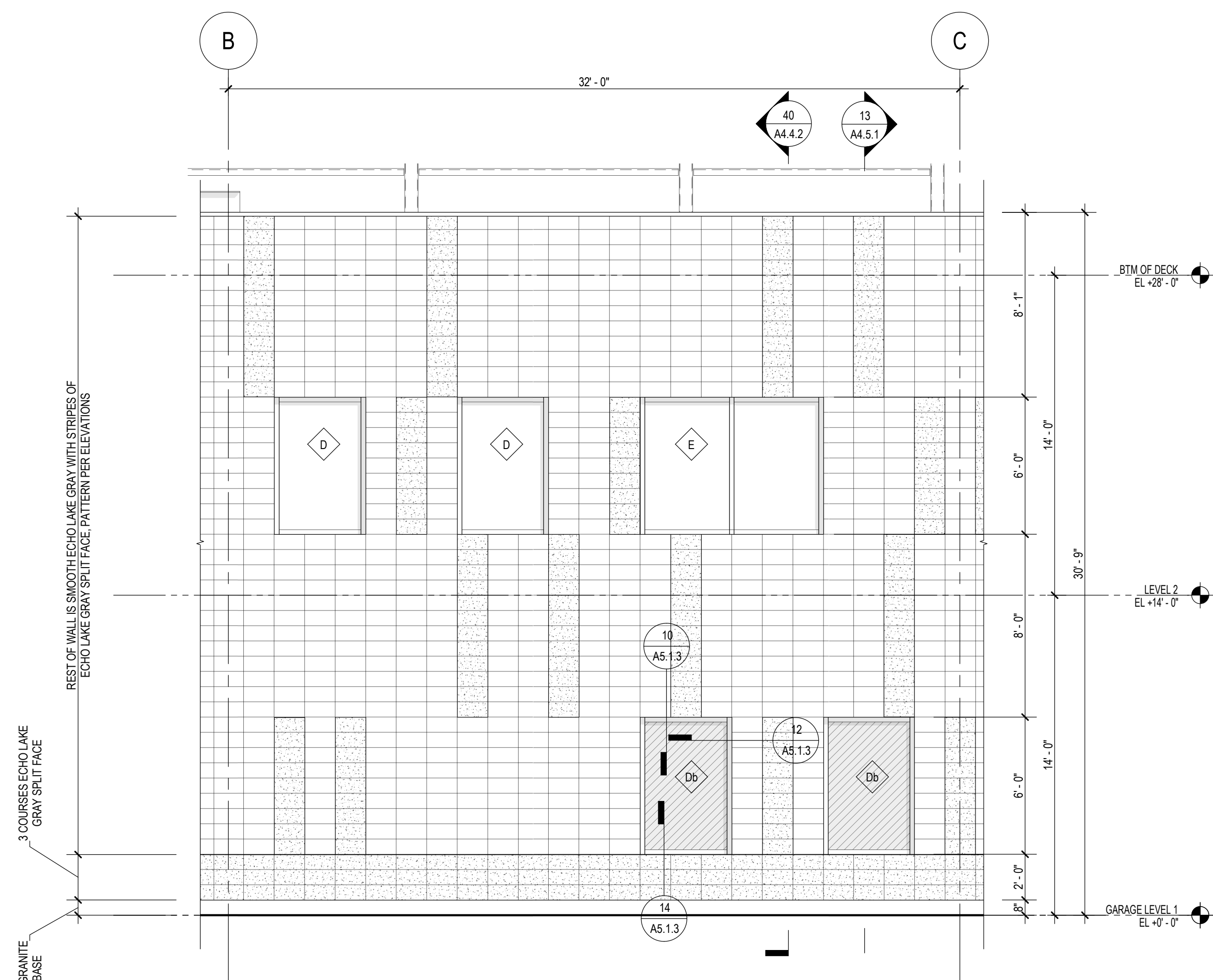
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NOT FOR
CONSTRUCTION

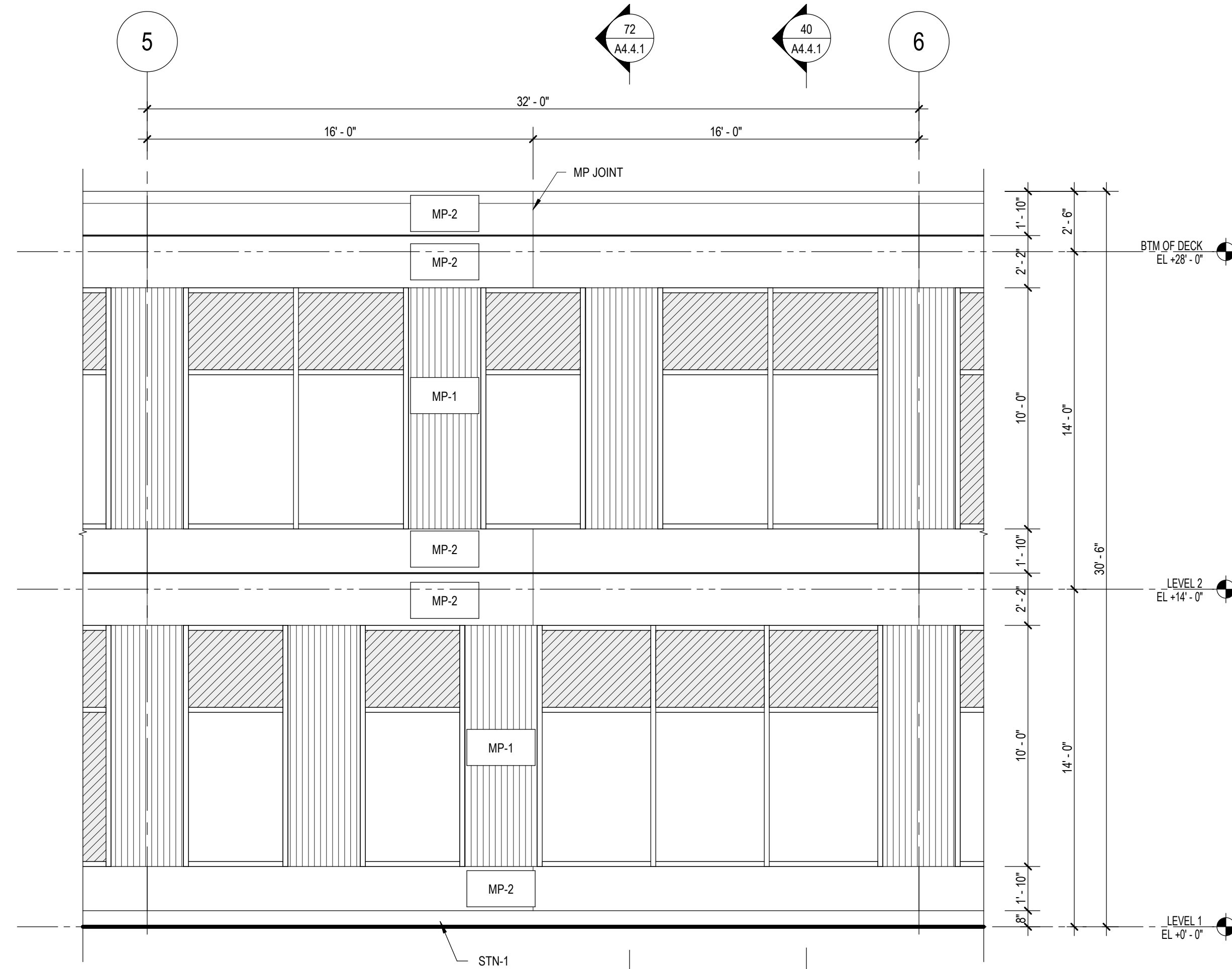
PROJECT NUMBER

A4.2.1

SHEET NUMBER



3 WEST ELEVATION - ENLARGED
SCALE: 1/4" = 1'-0"



1 SOUTH ELEVATION - ENLARGED
SCALE: 1/4" = 1'-0"

LEGENDS:

CURTAINWALL

CW-X THERMALLY BROKEN UNITIZED CURTAIN WALL SYSTEM

STOREFRONT

	SF A, B, & C	THERMALLY BROKEN STORE-FRONT SYSTEM; "PUNCHED" WINDOWS
---	-------------------------	---

GLASS

GL-1 STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT

GL-1a		STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL UNIT
-------	---	---

GL-1b STRUCTURALLY GLAZED, LOW E, TEMPERED

GL-1c  STRUCTURALLY GLAZED, LOW E, TEMPERED, SPANDREL UNIT

GL-2 STRUCTURALLY GLAZED, LOW E, CLEAR INSUL UNIT

GL-2a		STRUCTURALLY GLAZED, LOW E, SPRANDREL INSUL. UNIT
-------	---	--

METAL

 MP-1 METAL PANEL - CORRUGATED, COLOR = 1

MP-2	METAL PANEL - FLAT, COLOR - 2
------	-------------------------------

	MP-3	METAL PANEL - FLAT, COLOR - 3
---	------	-------------------------------

 MP-34 PERFORATED MTAL PANEL - CORRUGATED,
COLOR - 3

MASONRY & STONE

	CMU-1	CONCRETE MASONRY UNIT VENEER WALL, FINISH - 1
---	--------------	--

	CMU-2	CONCRETE MASONRY UNIT VENEER WALL, FINISH - 2
---	--------------	--

	CMU-3	CONCRETE MASONRY UNIT VENEER WALL, FINISH - 3
---	--------------	--

	STN-1	GRANITE, FINISH - 1
--	-------	---------------------

FDS JBB PORTLAND, LLC

c/o FD STONEWATER, LLC
1001 19th St N #1401
ARLINGTON, VA 22209
703.537.7650

VA PORTLAND CBOC

141 W. COMMERCIAL ST.
PORTLAND, MAINE 04102

SMITHGROUP

100 HIGH STREET, SUITE 1800
BOSTON, MA 02110
617.502.3400
www.smithgroup.com

SMITHGROUP
MEFPF
100 HIGH STREET, SUITE 1800
BOSTON, MA 02110
617. 502.3400

GORRILL PALMER
CIVIL / LA
707 SABLE OAKS DRIVE, SUITE 30
SOUTH PORTLAND, ME 04106
207.772.2515

LJB Inc.
STRUCTURAL
2500 NEWMARK DRIVE
MIAMISBURG, OH 45342
937.259.5000

[illegible]

SEALS AND SIGNATURES

NOT FOR
CONSTRUCTION

SHEET TITLE

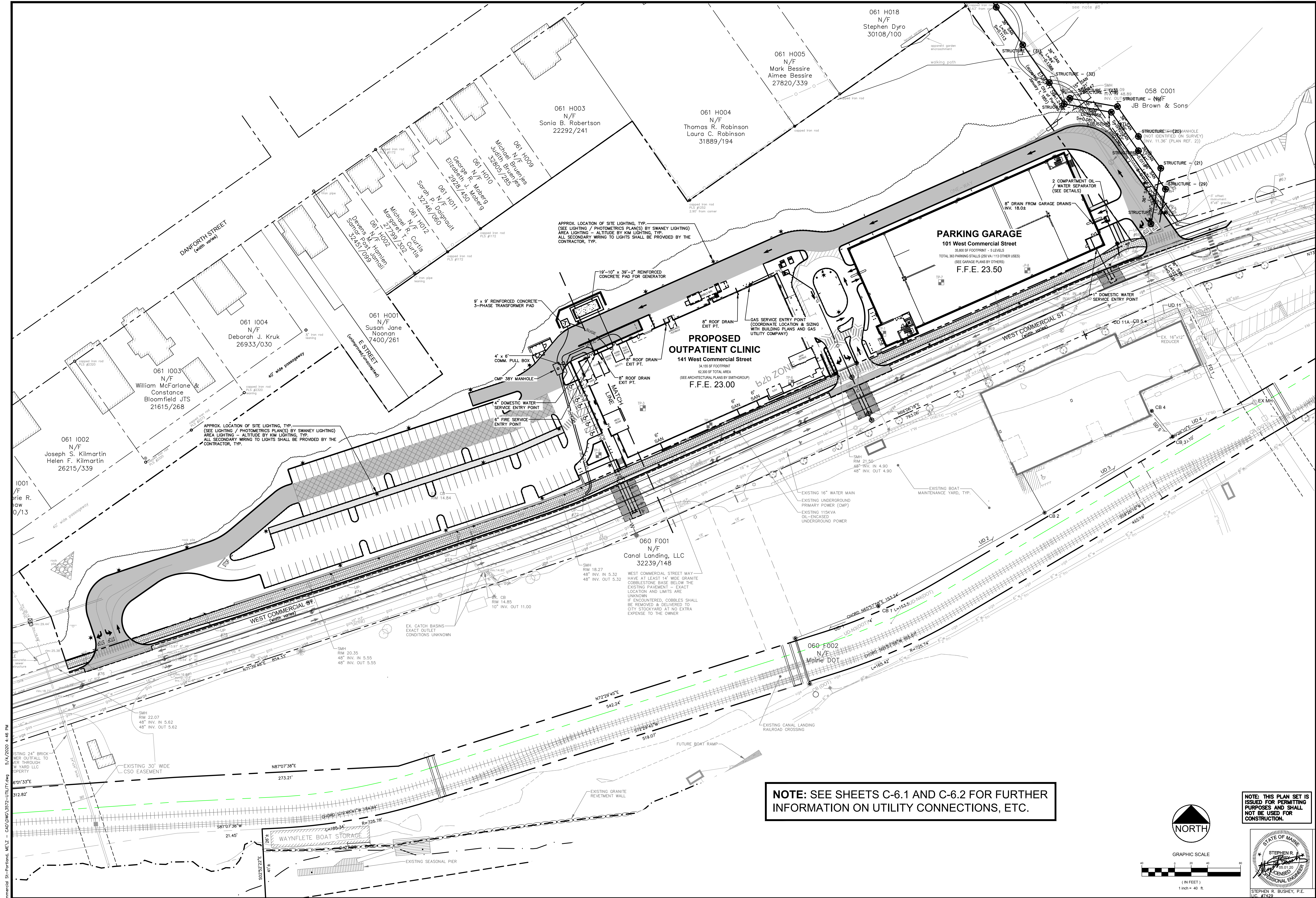
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PROJECT NUMBER

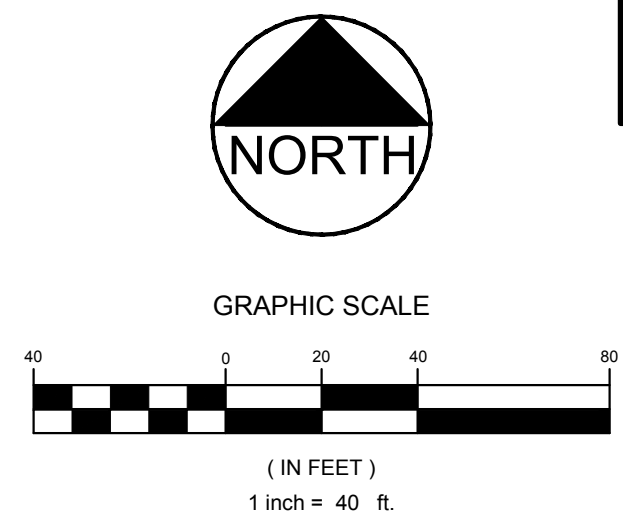
11865

A4.2.2

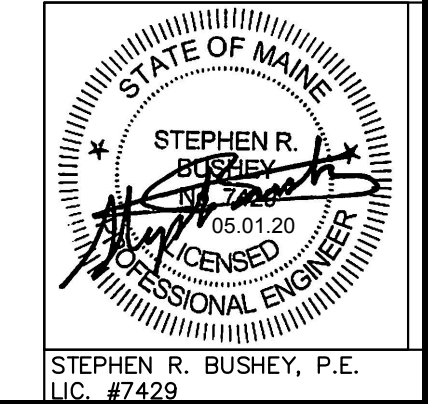
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NOTE: SEE SHEETS C-6.1 AND C-6.2 FOR FURTHER INFORMATION ON UTILITY CONNECTIONS, ETC.



NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.



Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		By

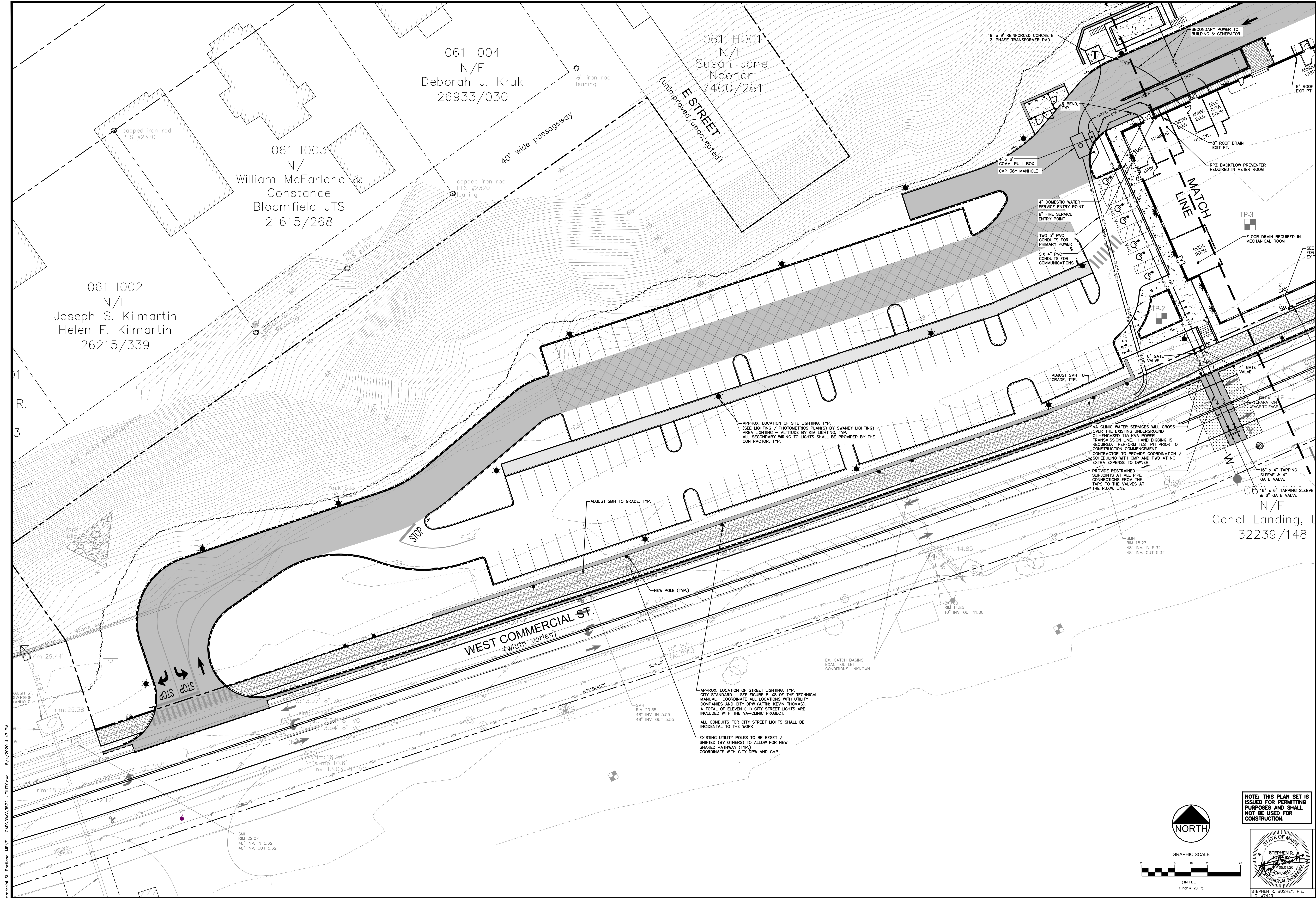
Design: SRB Draft: CDD Date: NOV. 2019
Checked: SRB Scale: AS NOTED Job No.: 3572
File Name: 3572-UTILITY.dwg
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207.772.2515

Drawing Name:	OVERALL UTILITY PLAN
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.
C-6.0



U:\3572_VA Clinic West Commercial St-Portland, ME.Z - CAD\DWG\3572-UTILITY.dwg 5/4/2020 4:47 PM

Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For		By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-UTILITY.dwg		
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Drawing Name:	UTILITY PLAN - WEST SIDE
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-6.1
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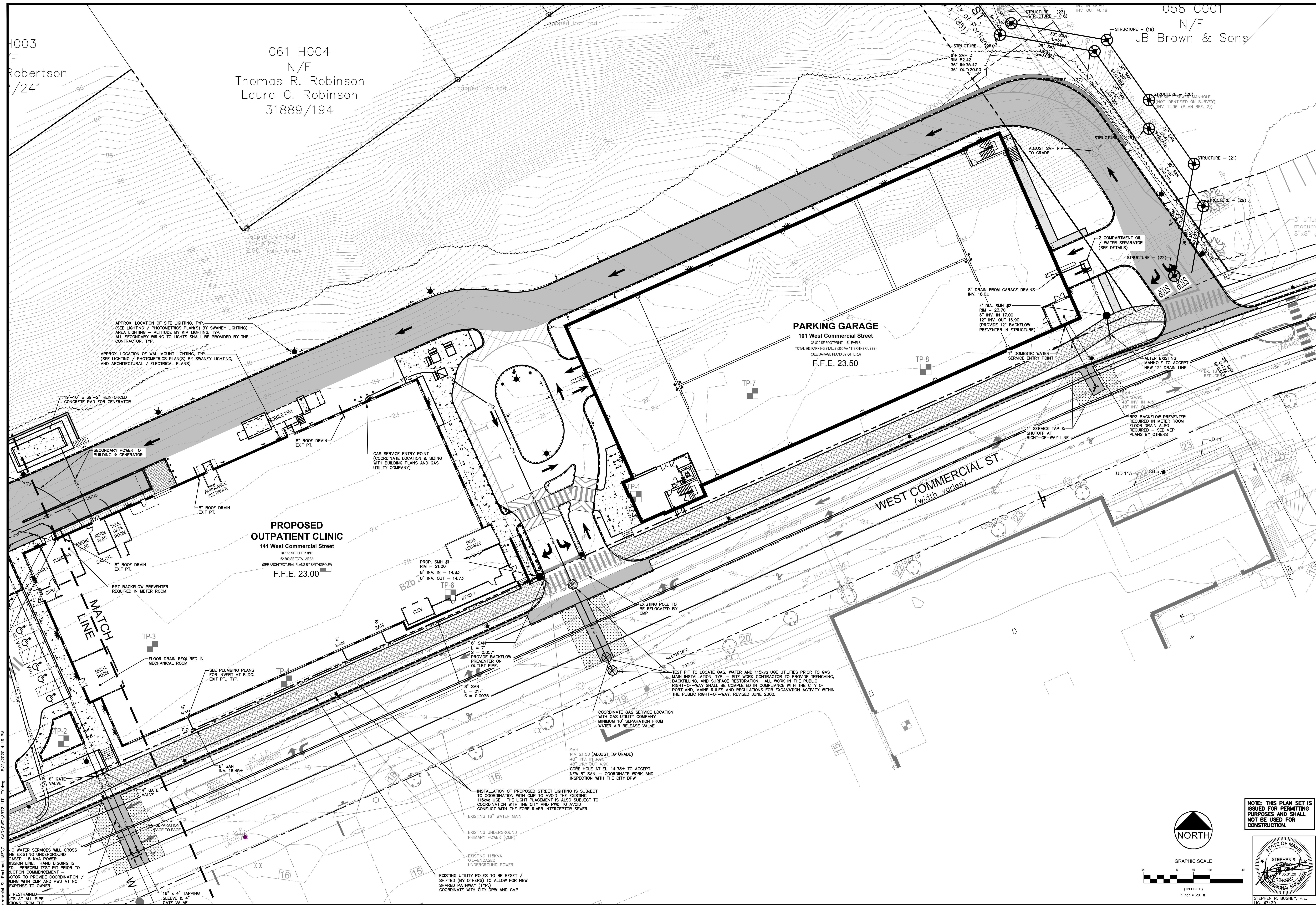
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.

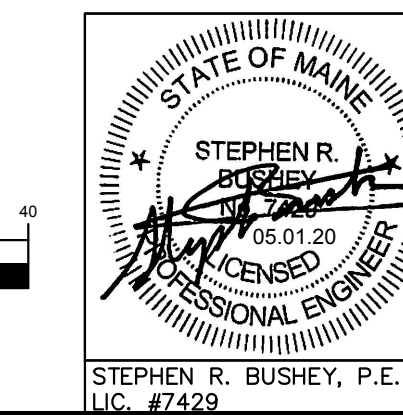
STEPHEN R. BUSHEY, P.E.
LIC. #72529

061 H004
N/F
Thomas R. Robinson
Laura C. Robinson
31889/194

058 C001
N/F
JB Brown & Sons



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2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED
Rev.	Date	Revision

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
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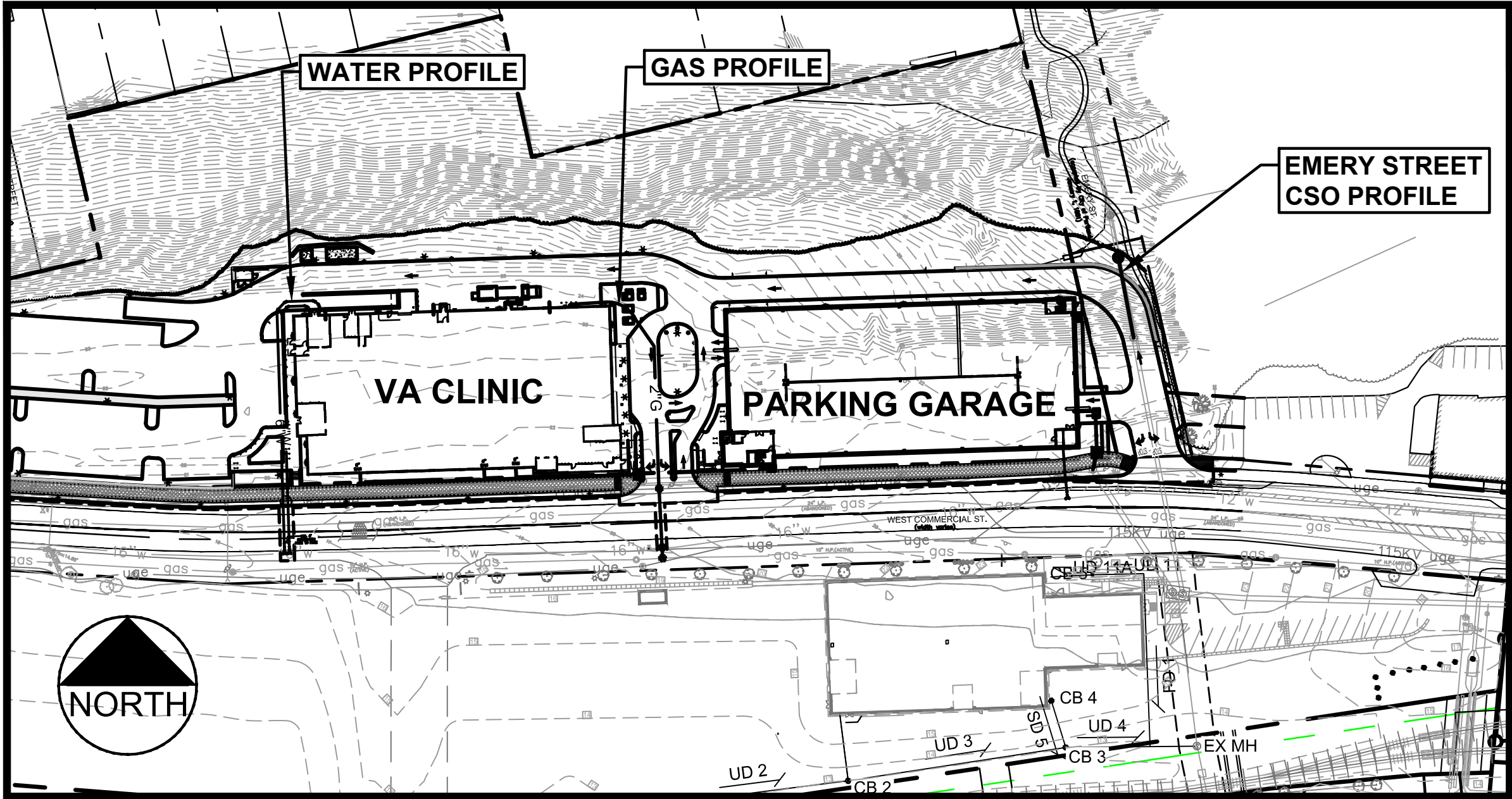
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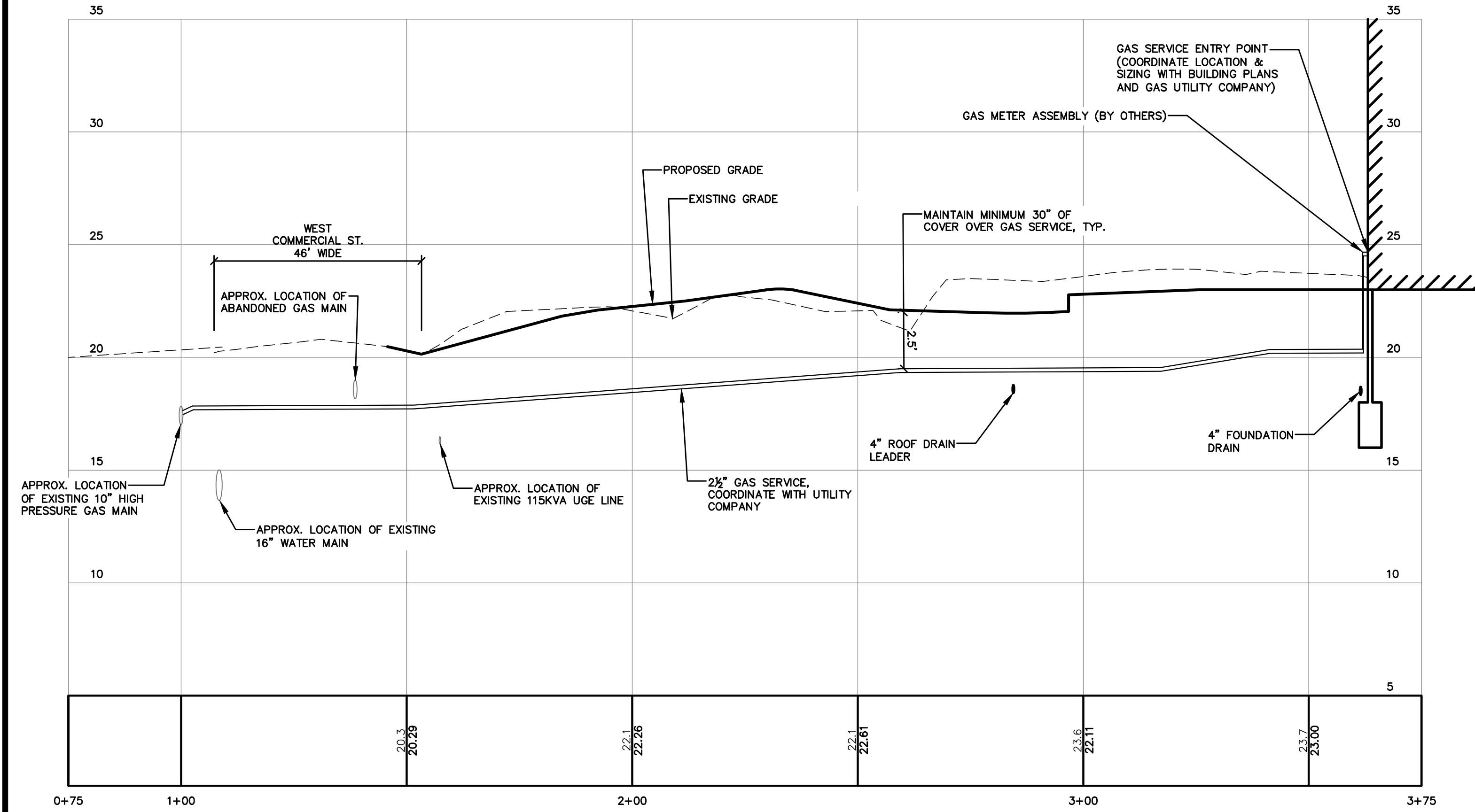
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207.772.2515

Drawing Name:	UTILITY PLAN – EAST SIDE
Project:	U.S. Department of Veterans Affairs – Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.
C-6.2

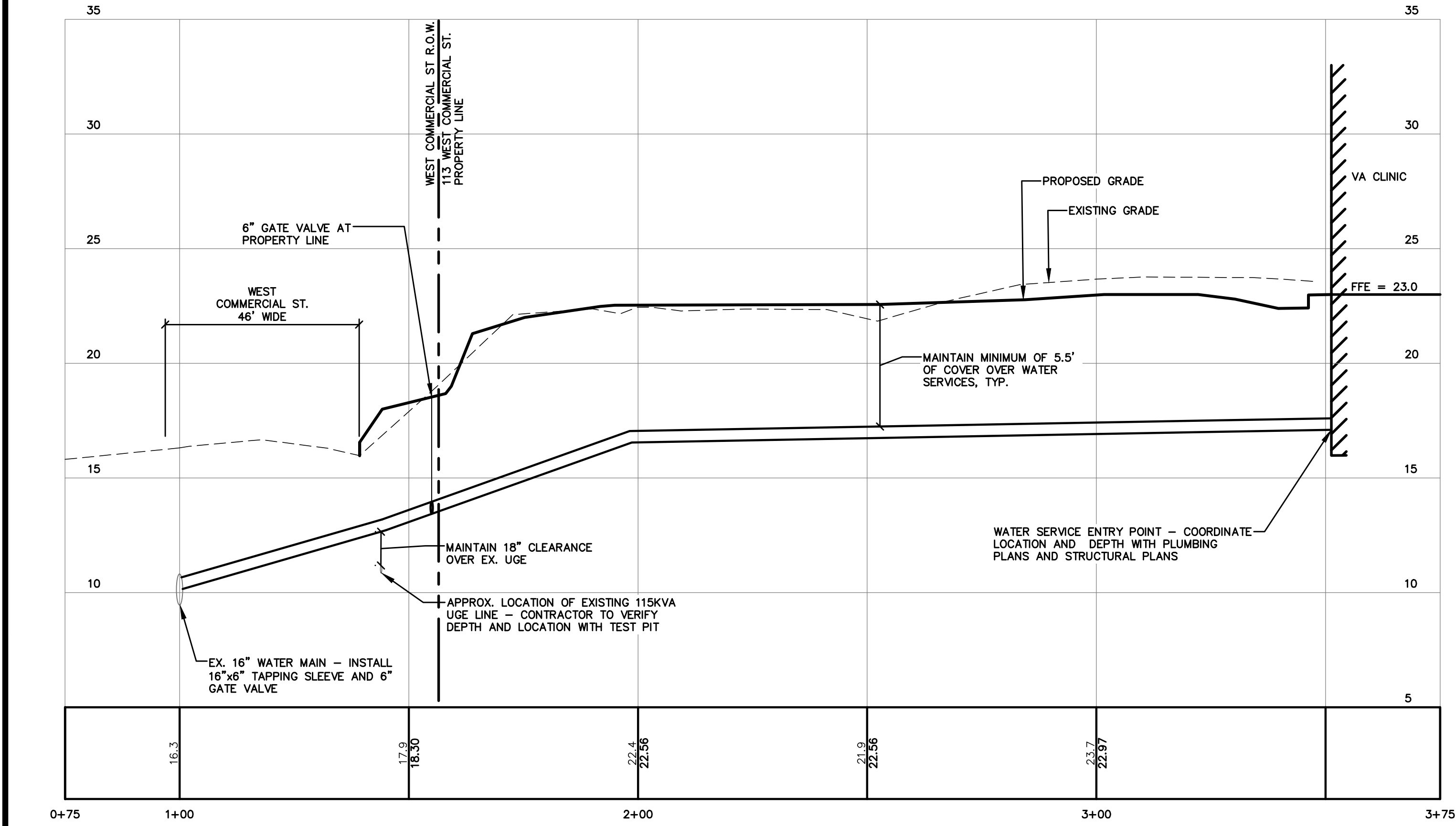


ORIENTATION SKETCH
SCALE: 1" = 100'



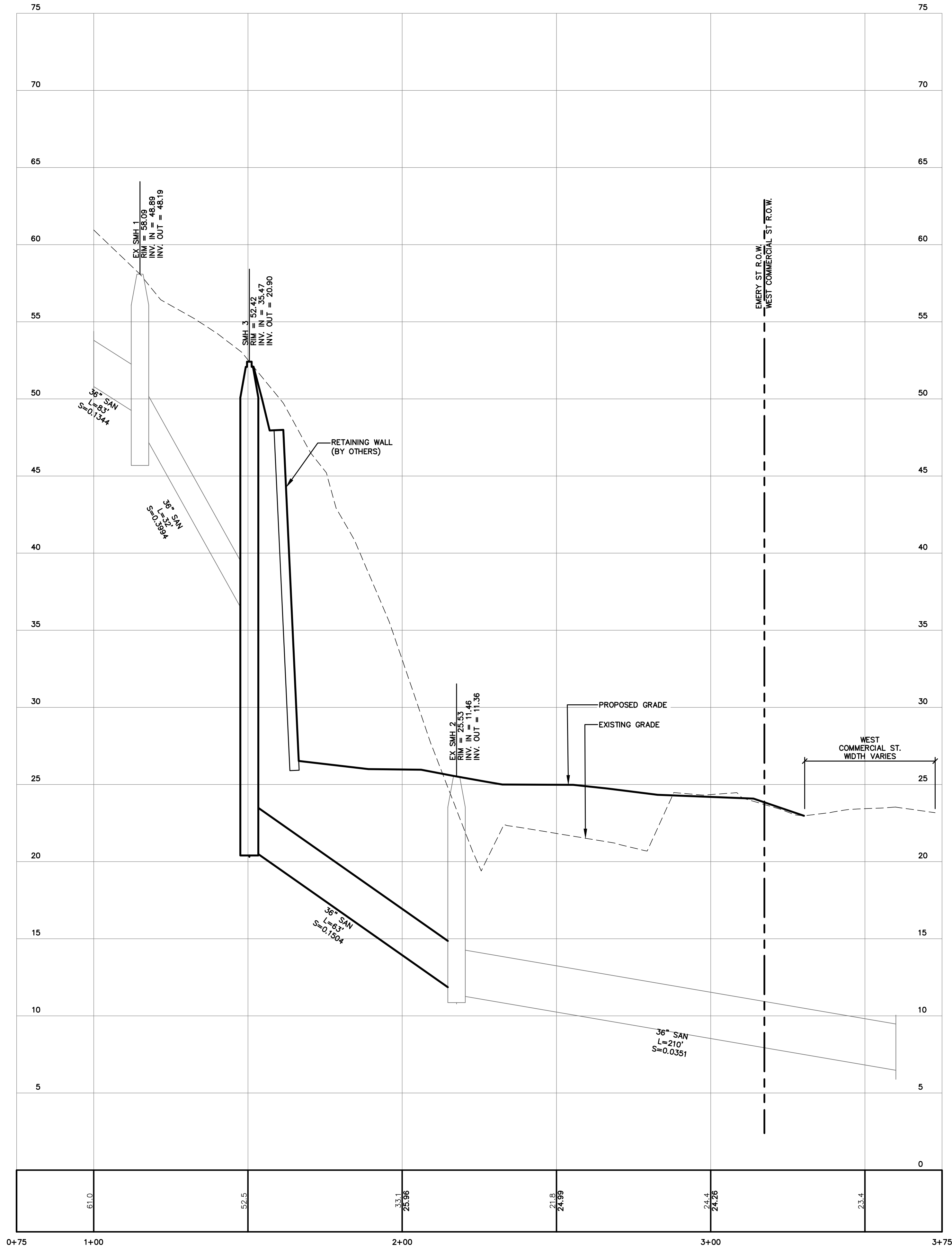
UTILITY PROFILE - GAS

HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 4'



UTILITY PROFILE - WATER

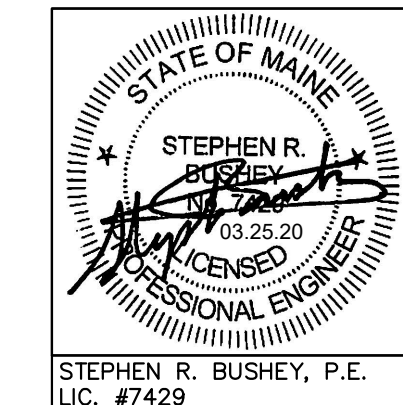
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 4'



UTILITY PROFILE - EMERY STREET CSO

HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 4'

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Rev.	Date	Revision
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

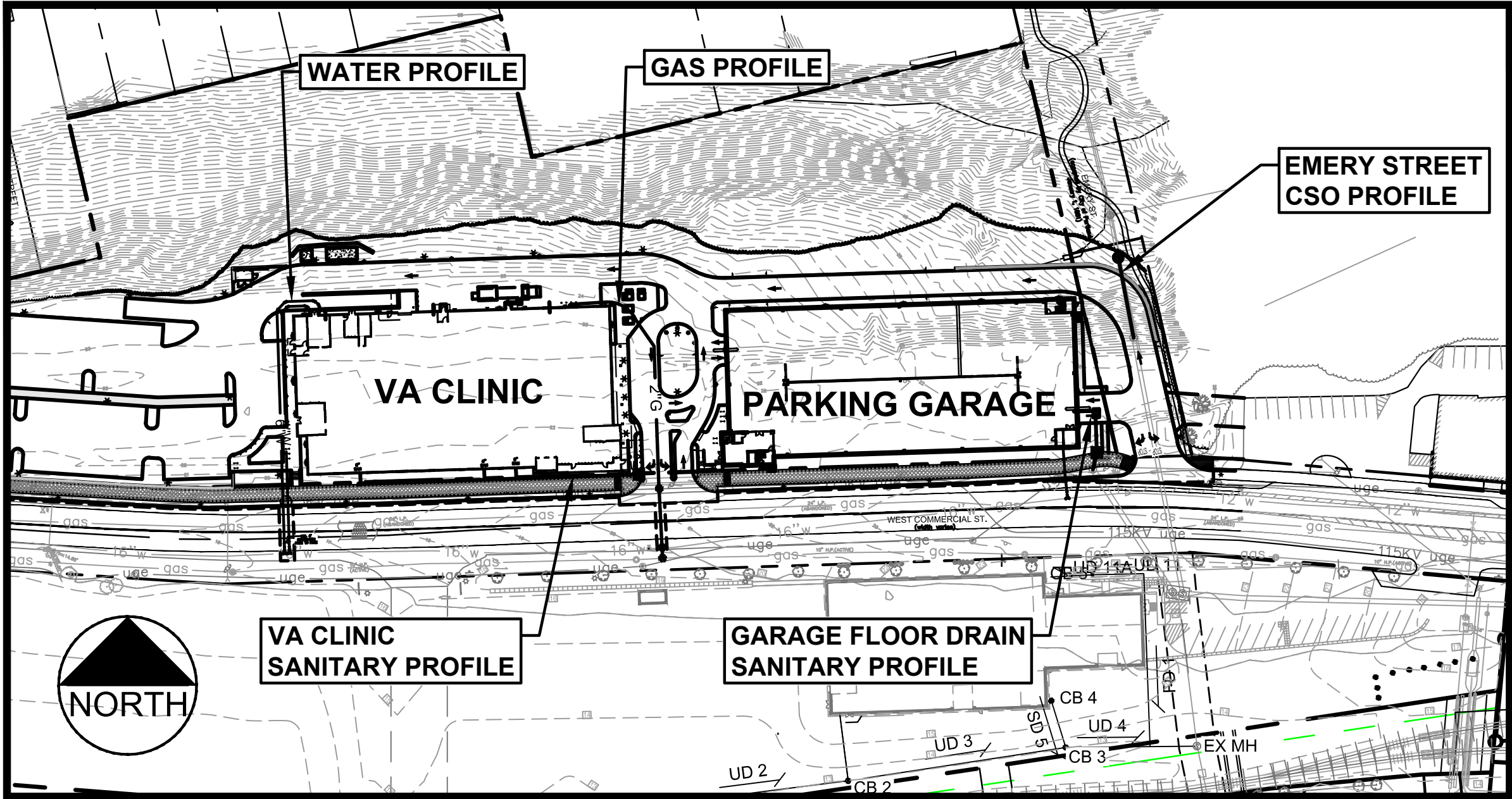
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Checked: SRB	Scale: AS NOTED	Job No.: 3572
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This plan shall not be modified without written permission from Gorrill Palmer Consulting Engineers, Inc.(GP). Any alterations, authorized or otherwise, shall be at the user's sole risk and without liability to GP.		



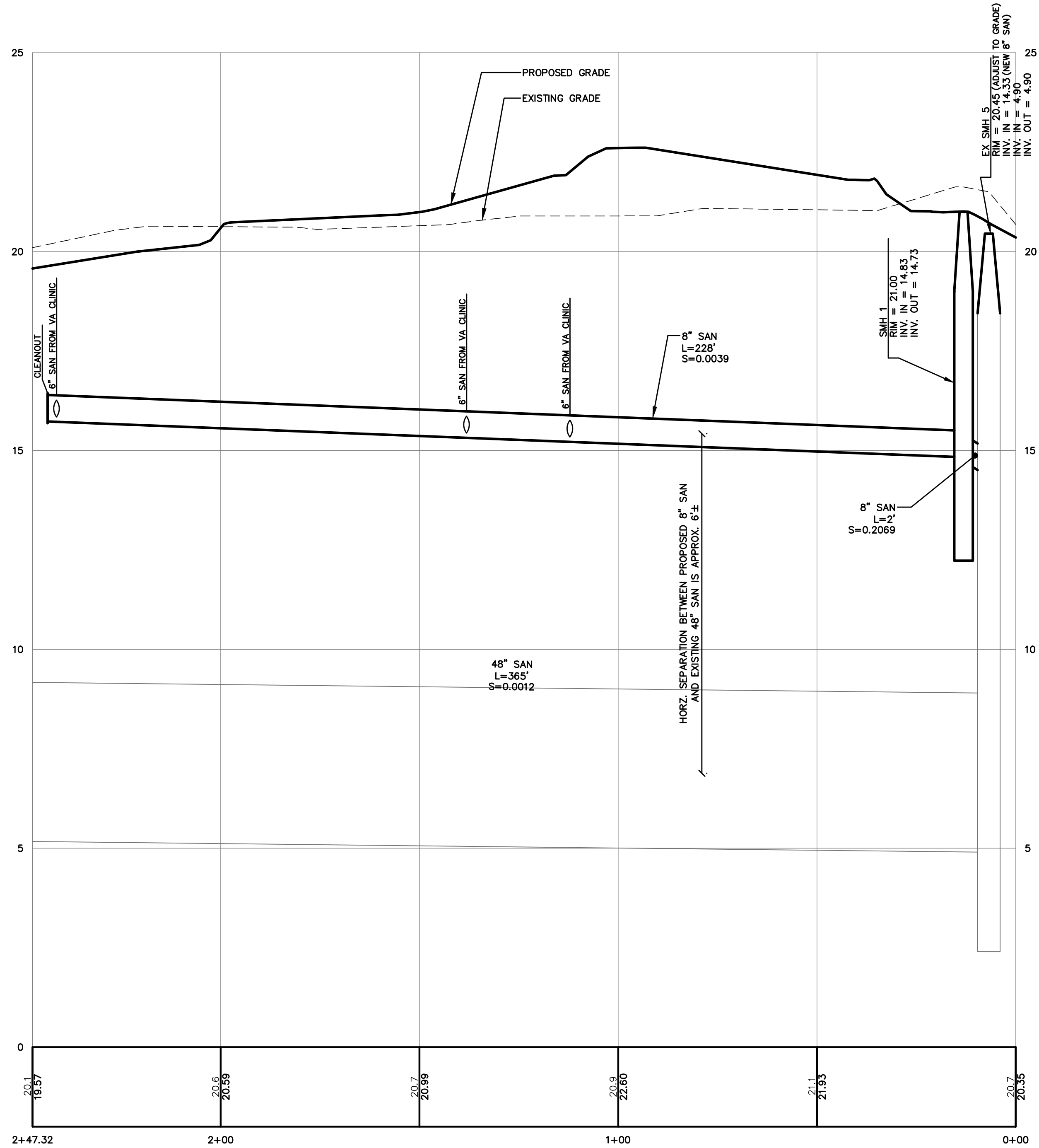
Relationships. Responsiveness. Results.
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207.772.2515

Drawing Name:	UTILITY PROFILES
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-12.0
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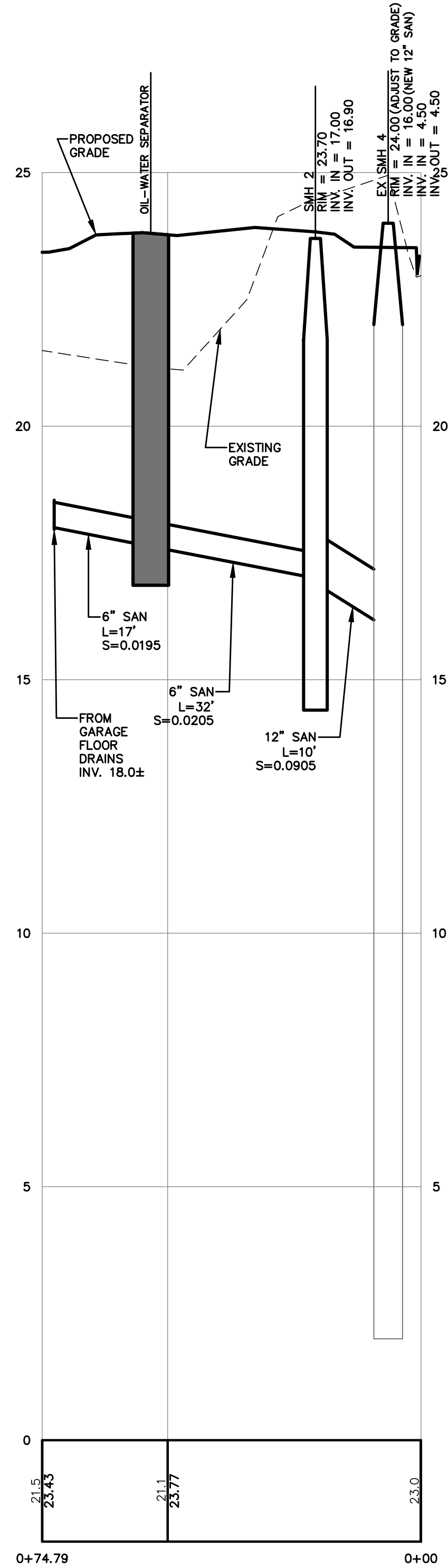


ORIENTATION SKETCH
SCALE: 1" = 100'



VA CLINIC SANITARY SEWER PROFILE

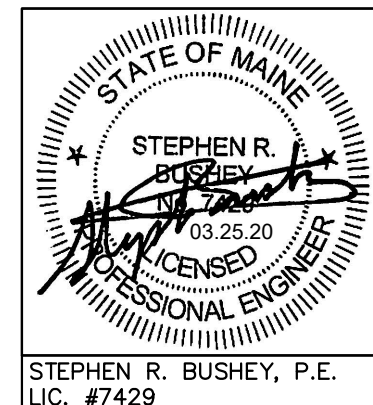
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 4'



GARAGE FLOOR DRAIN SANITARY SEWER PROFILE

HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 4'

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.



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Rev.	Date	Revision
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

Released To	Date	By
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB

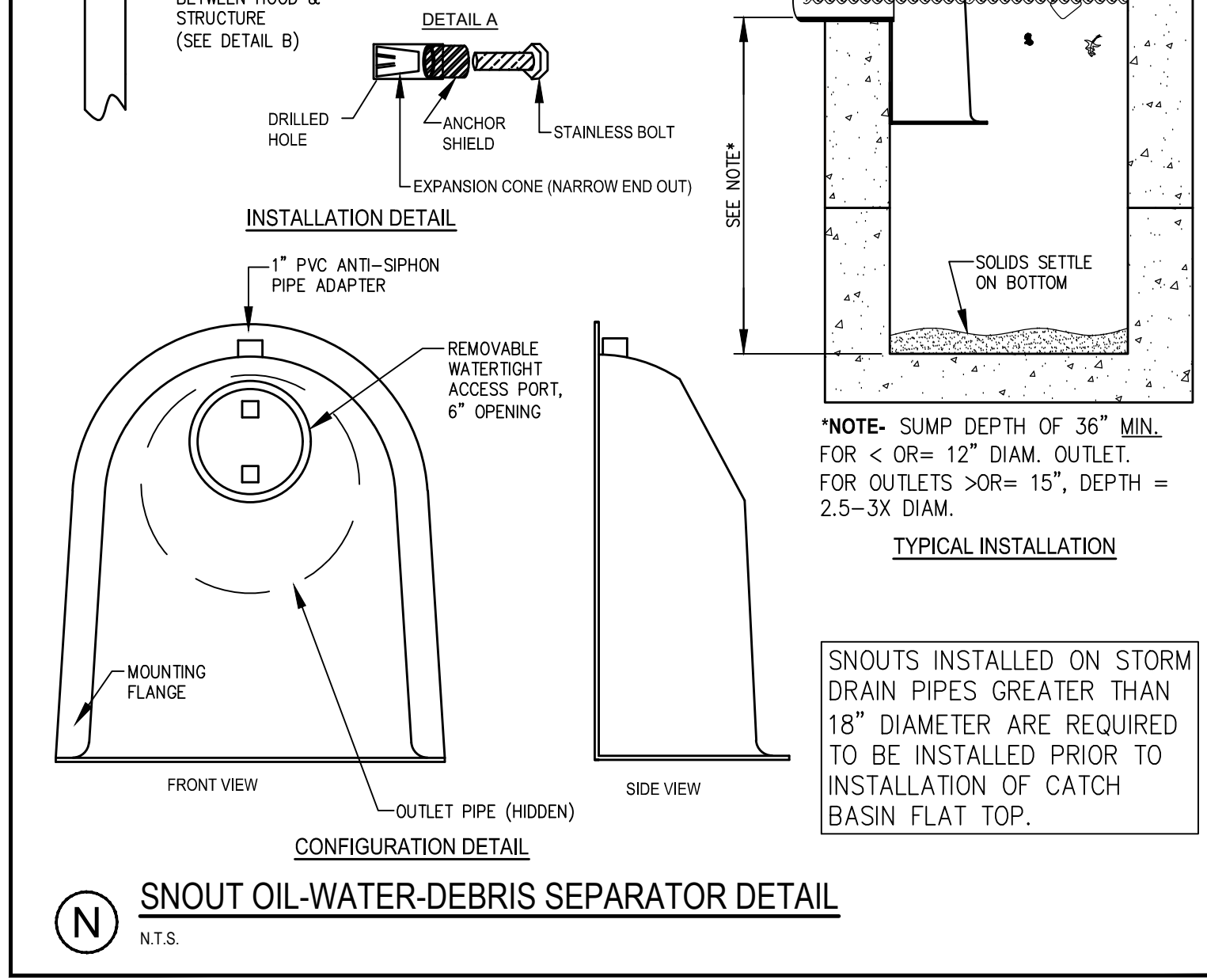
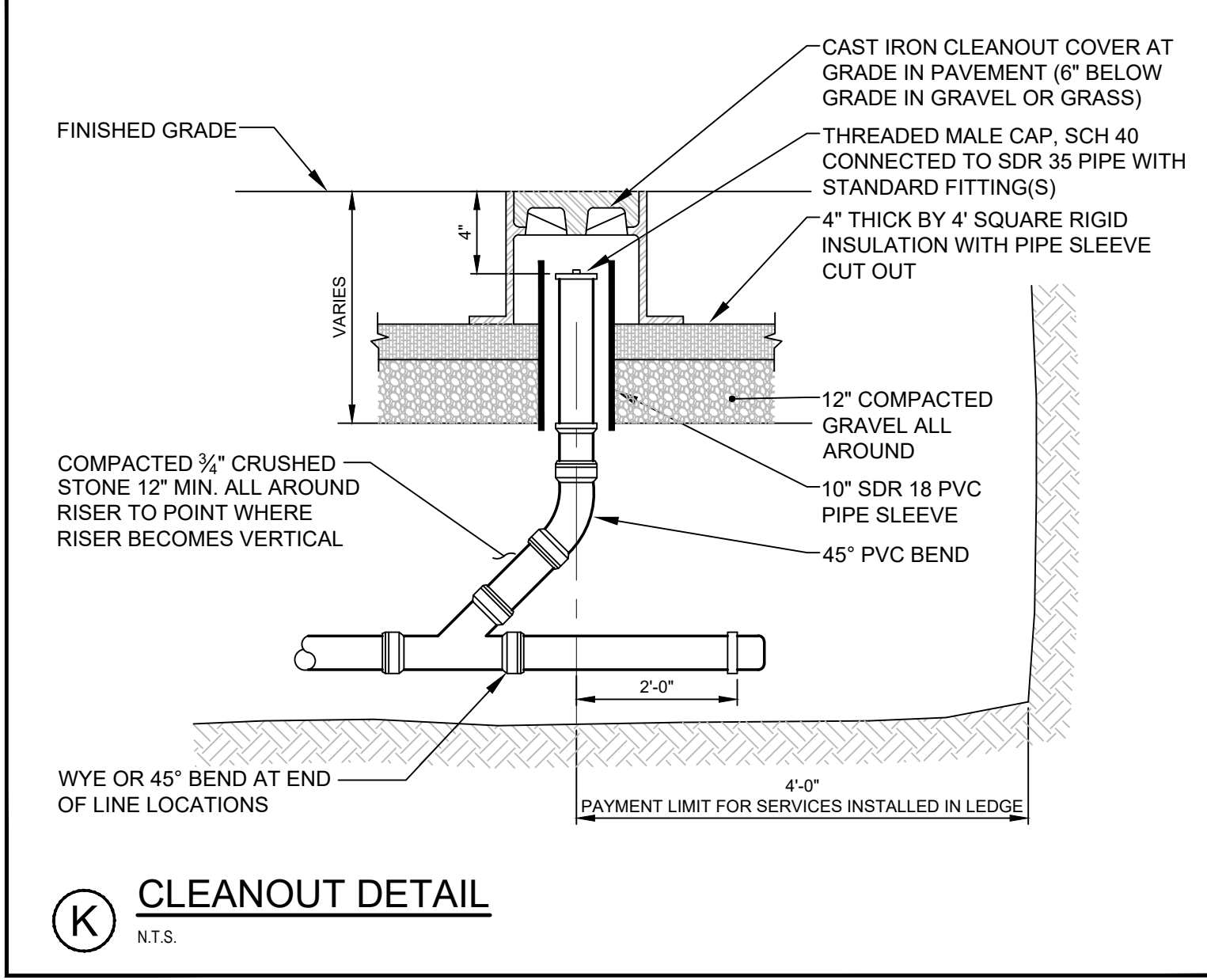
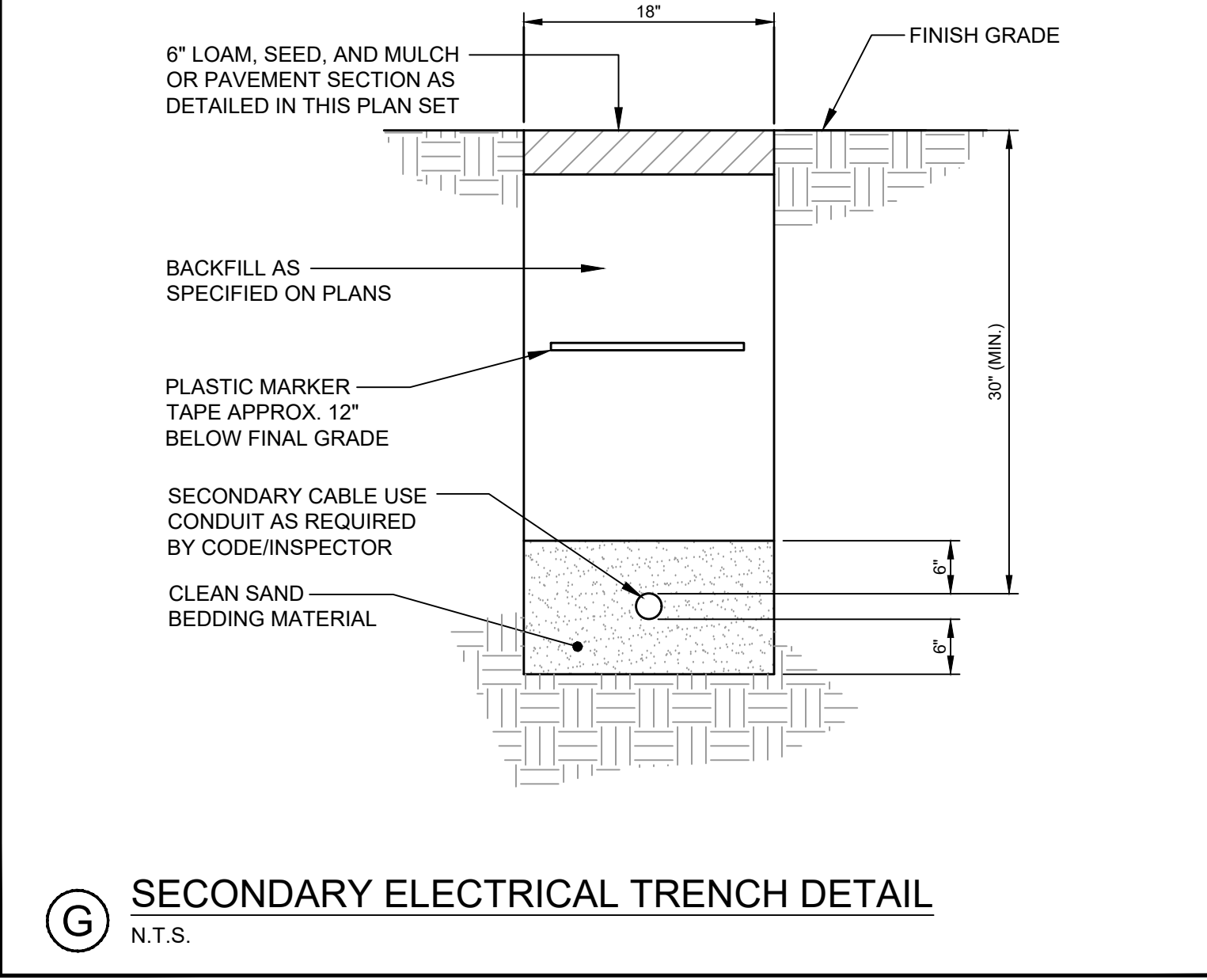
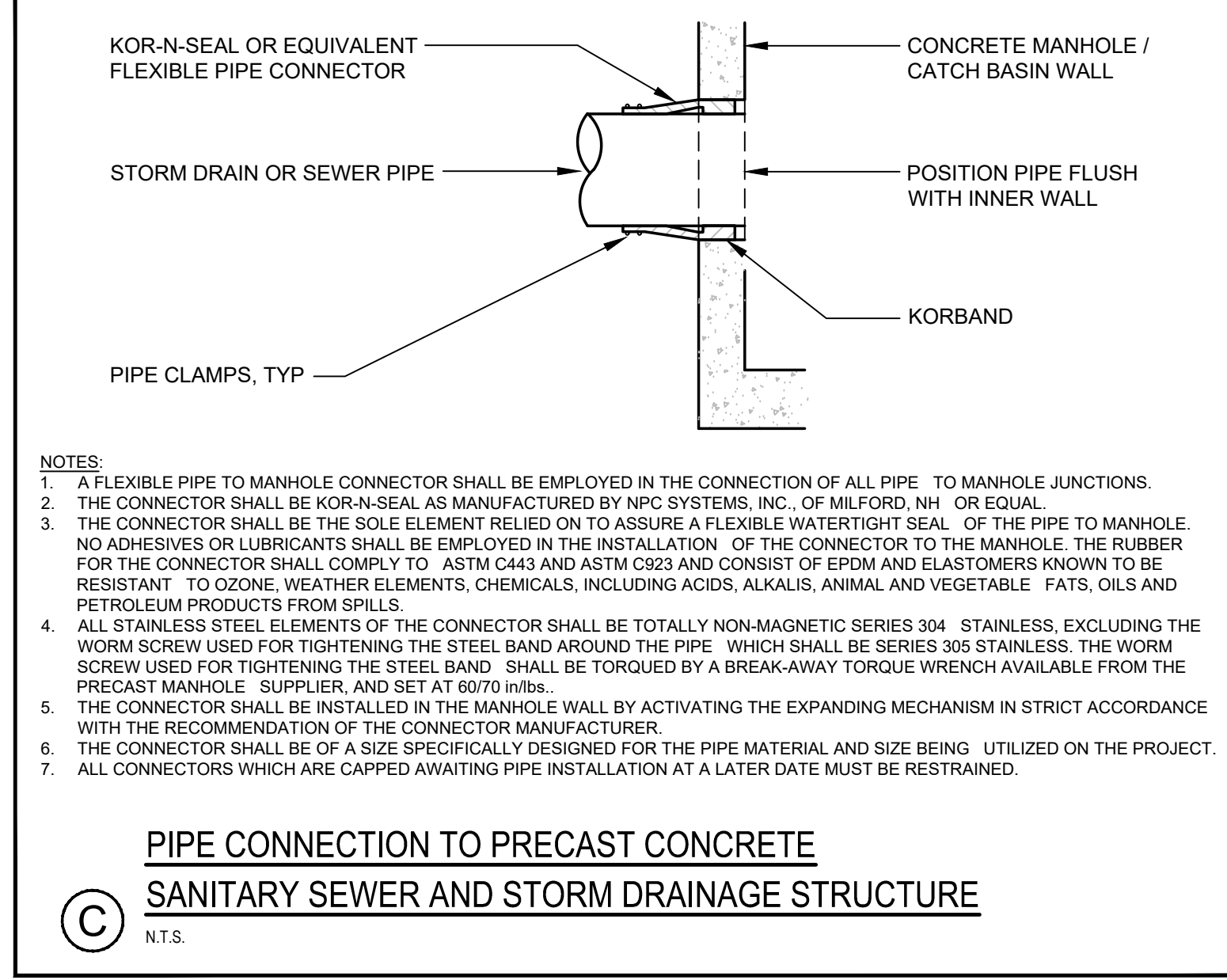
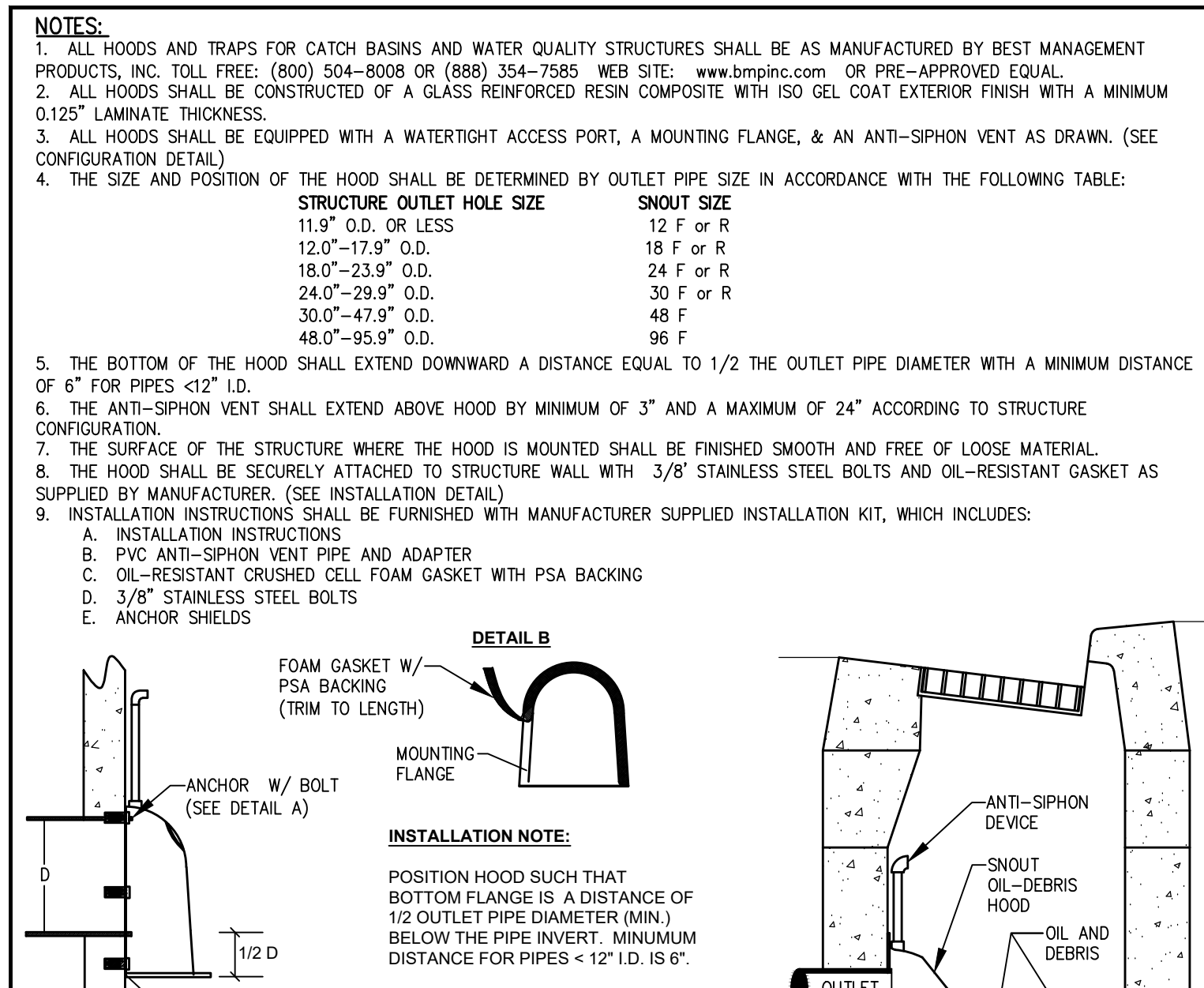
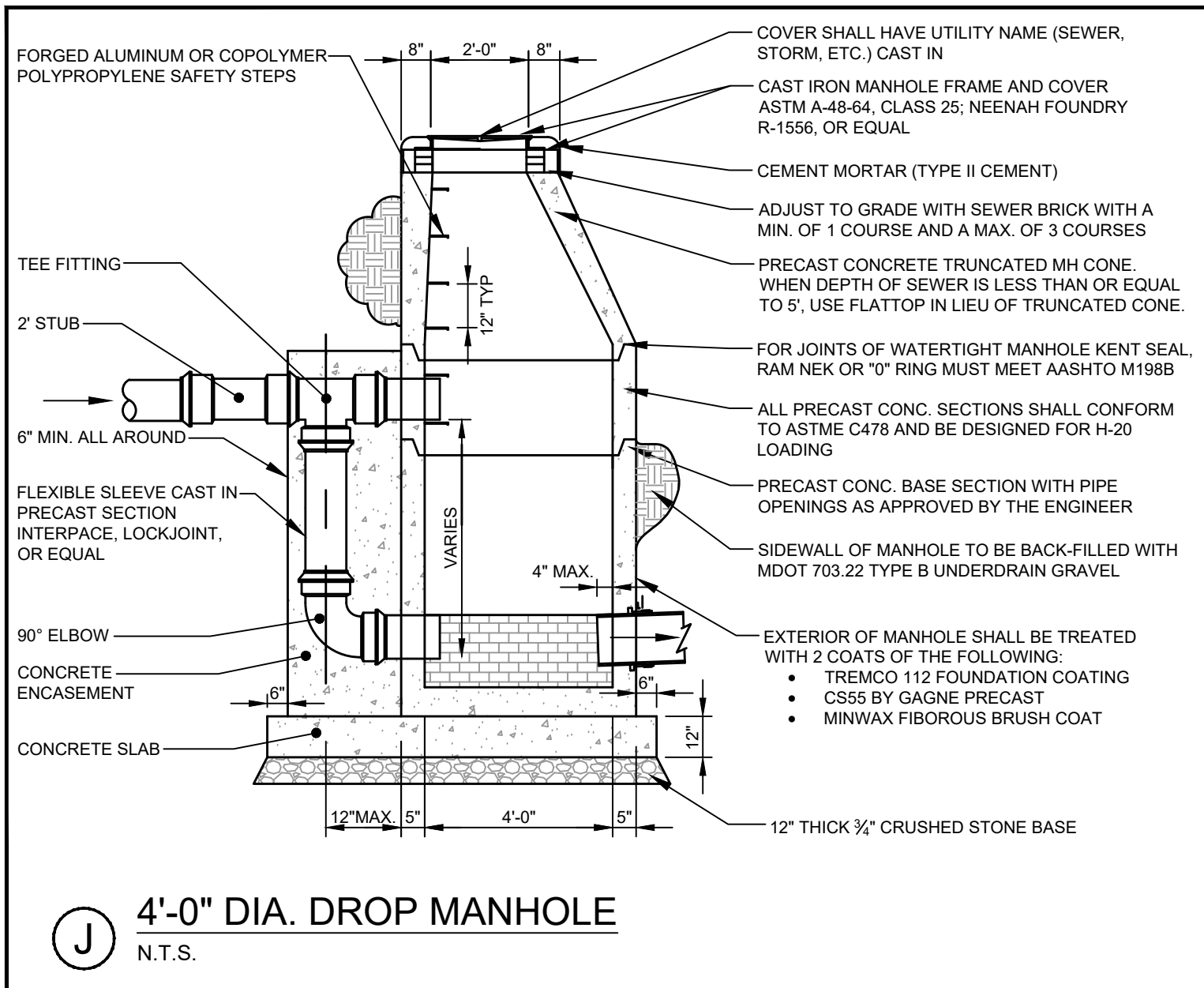
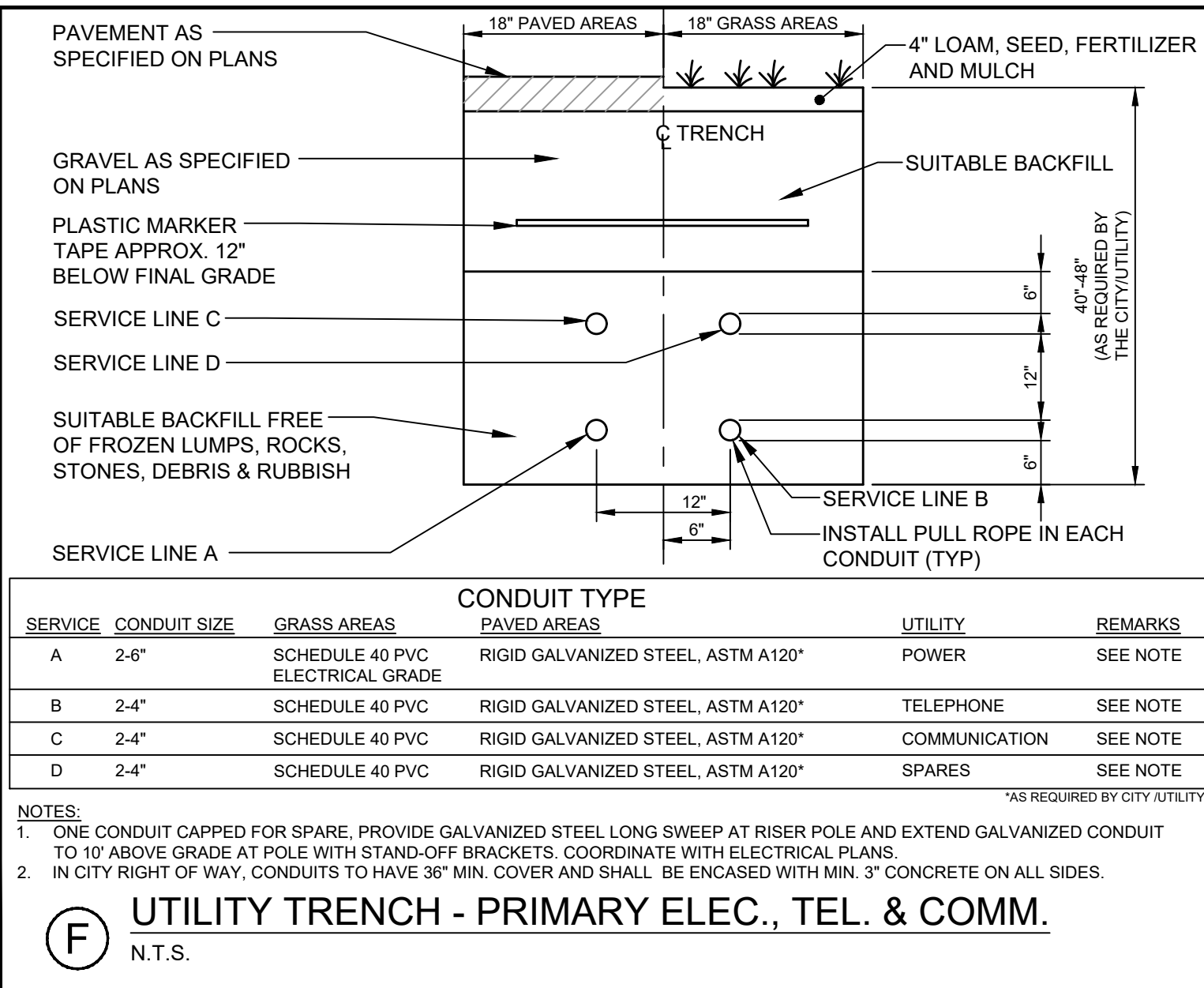
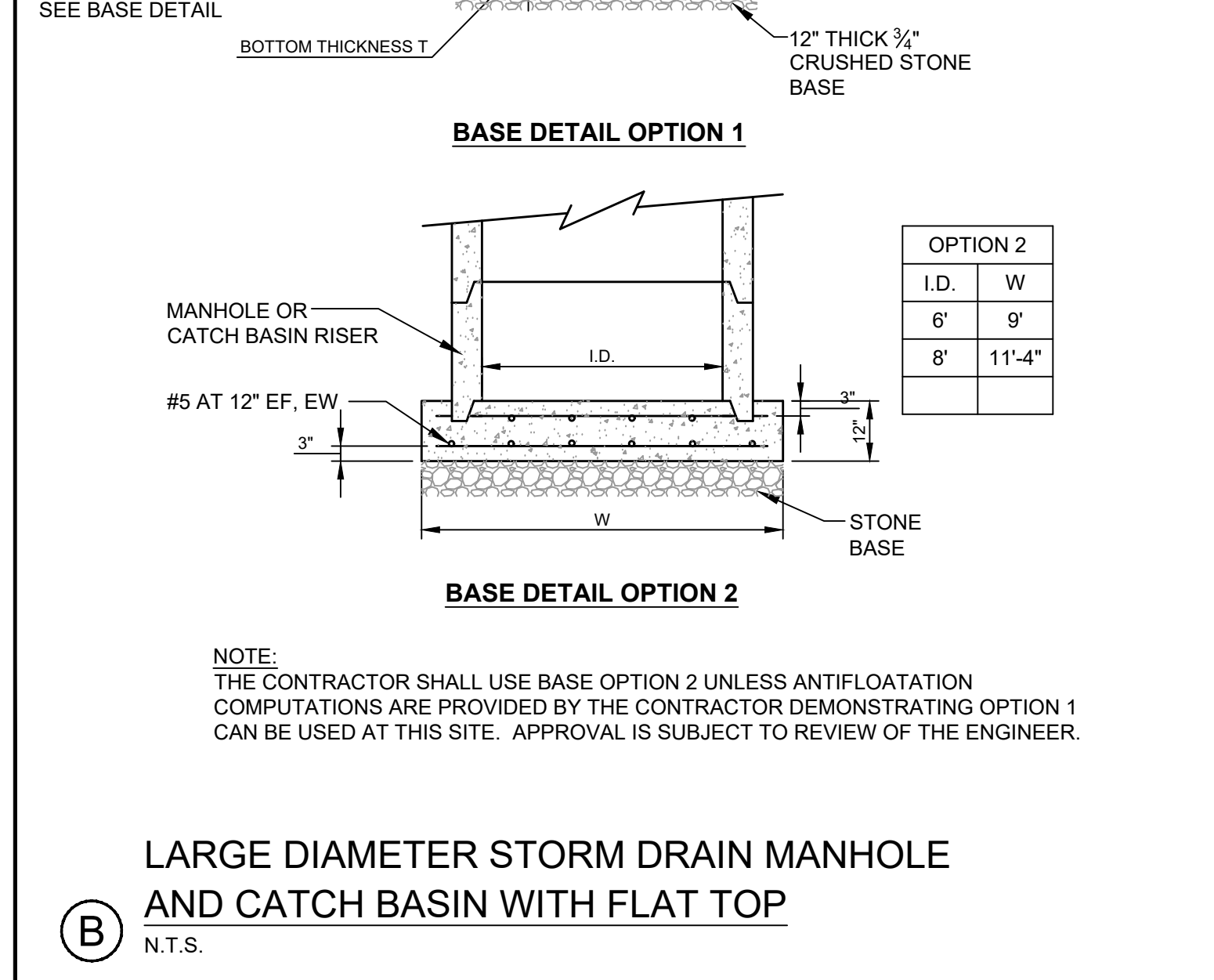
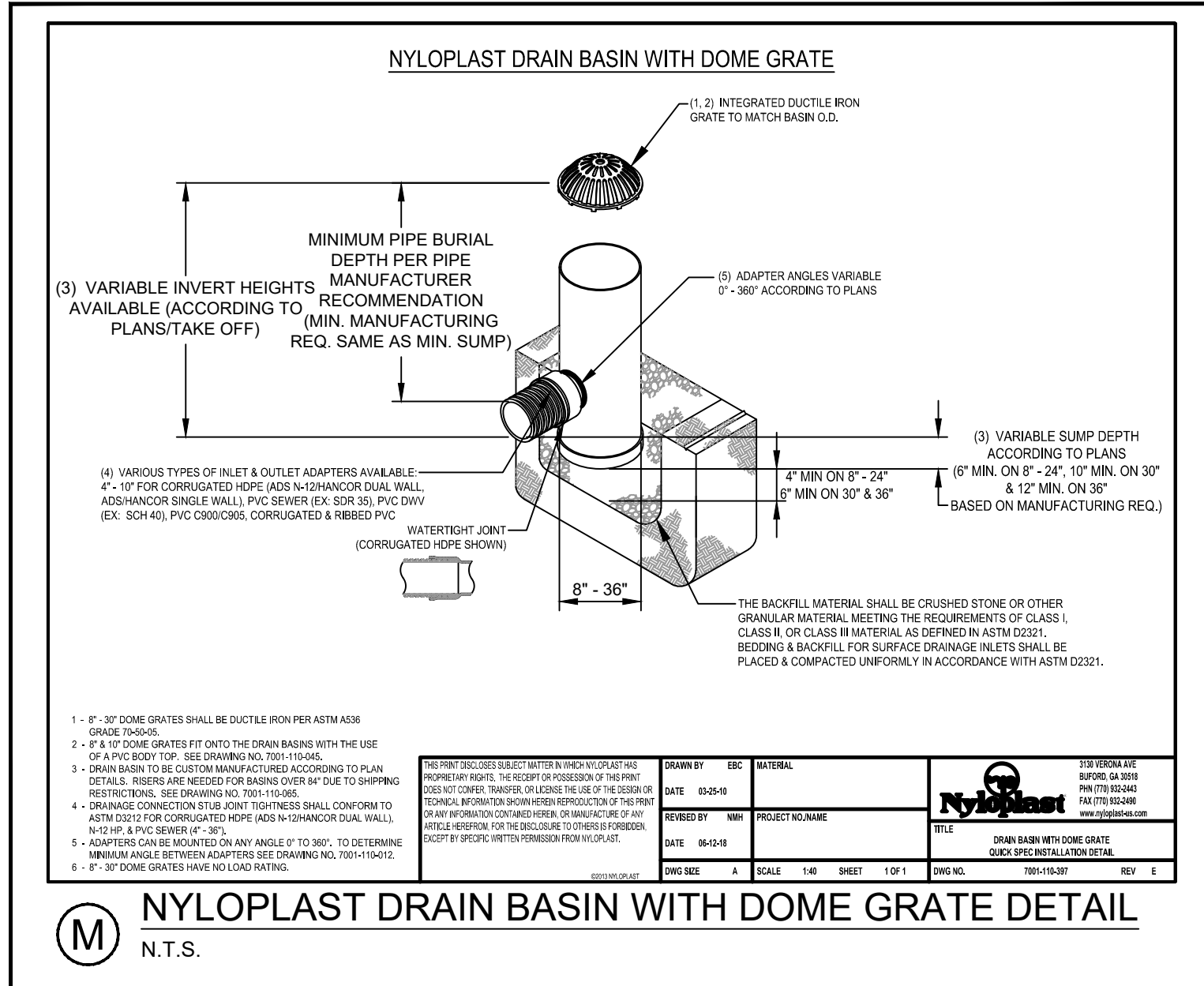
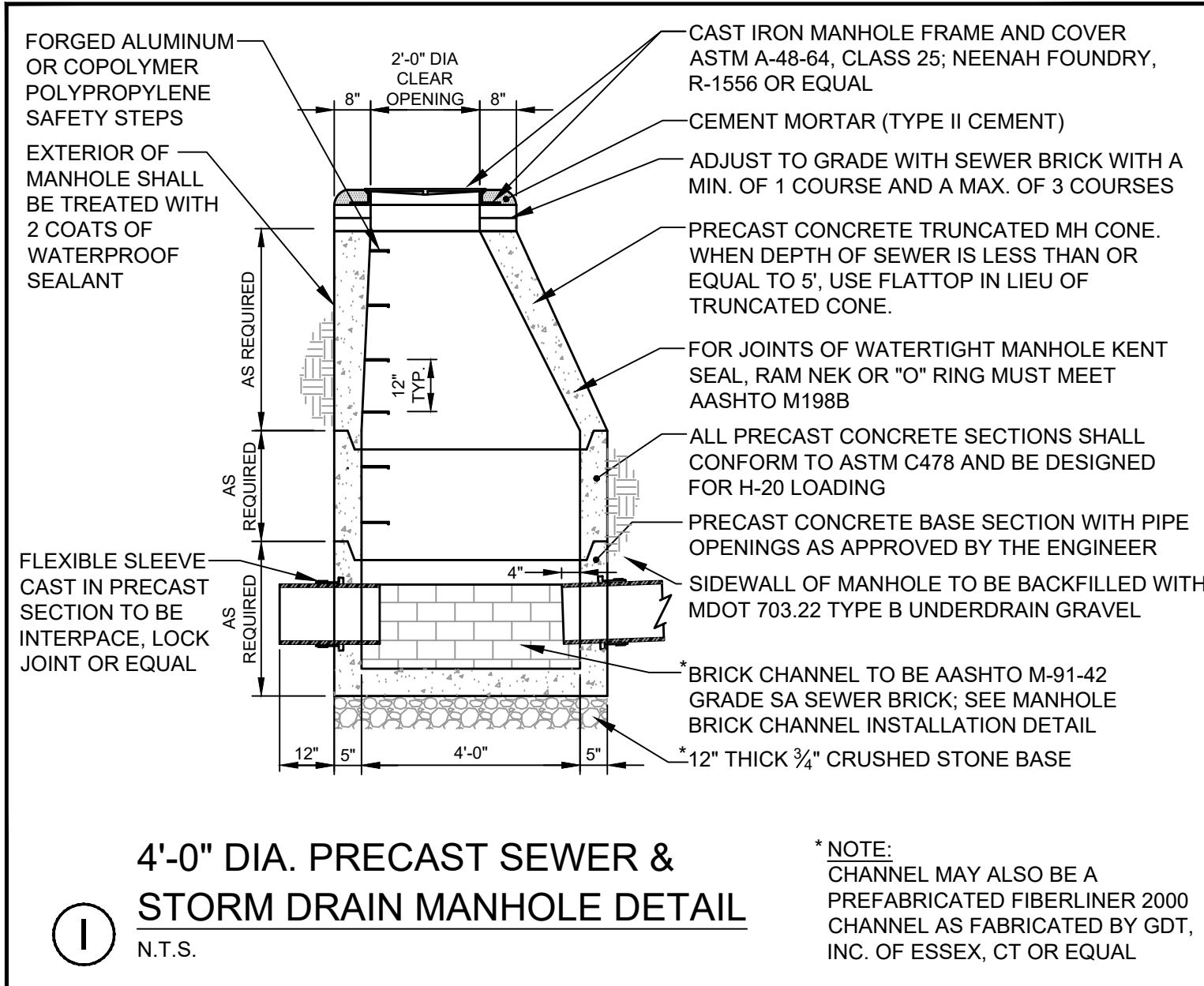
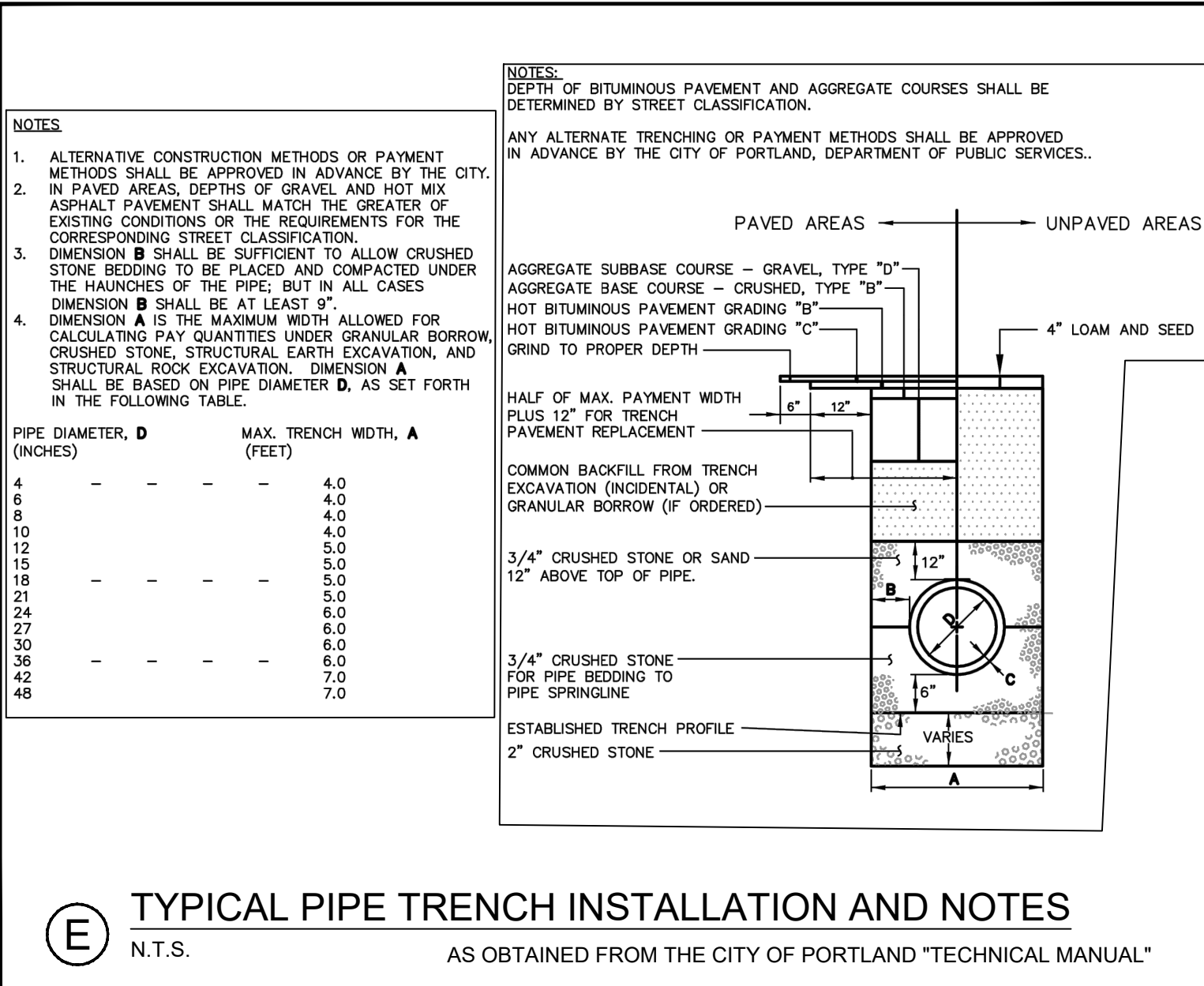
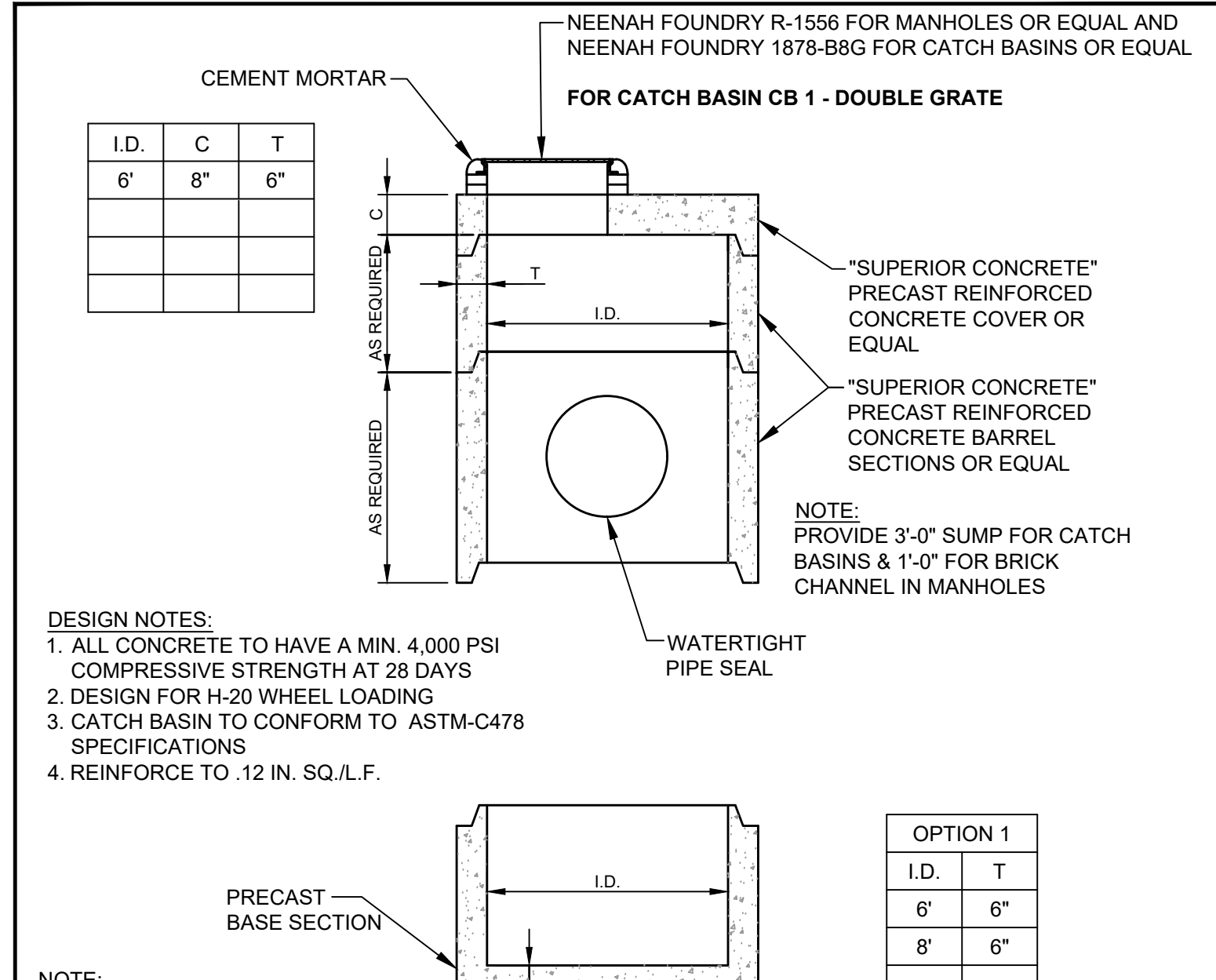
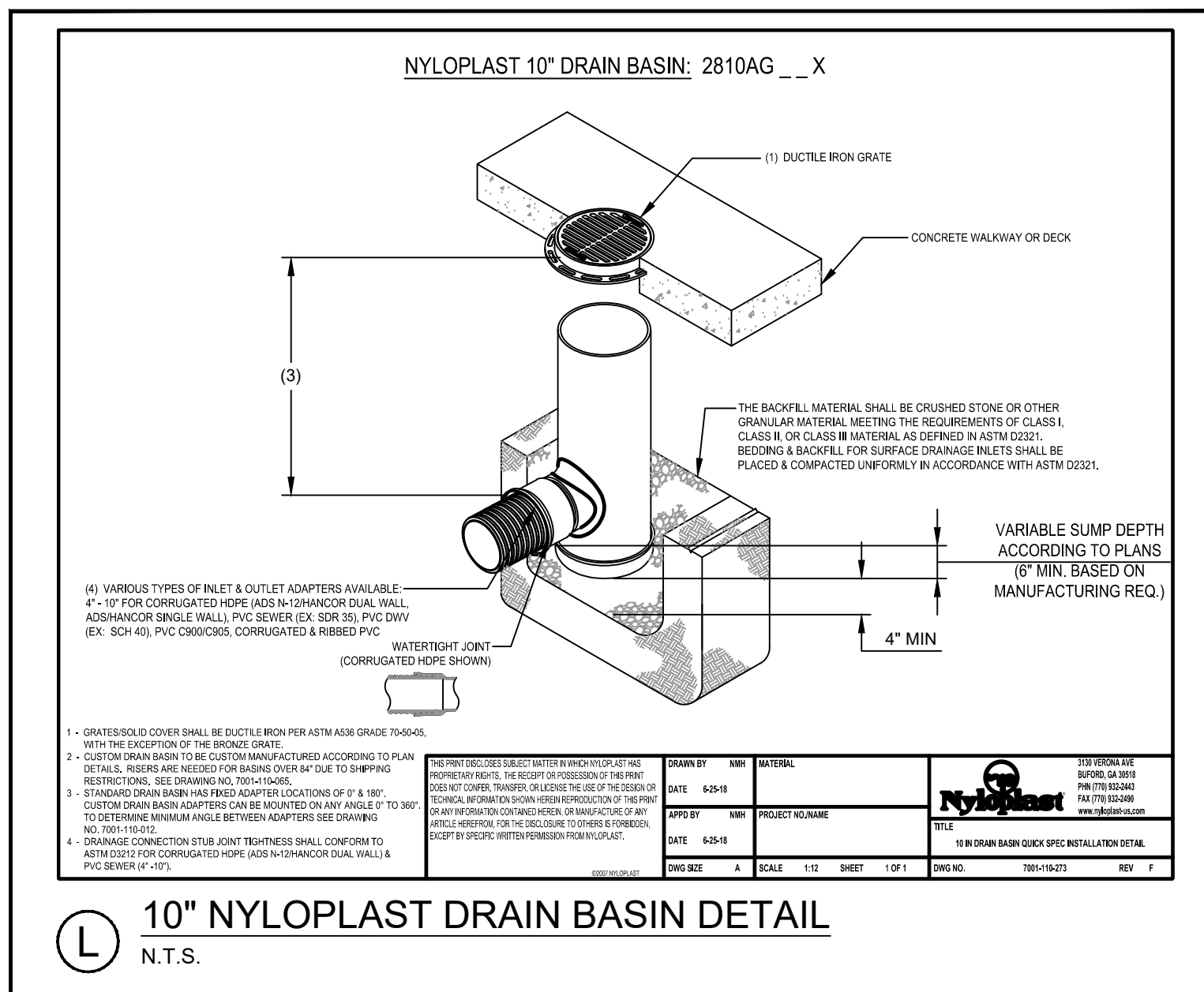
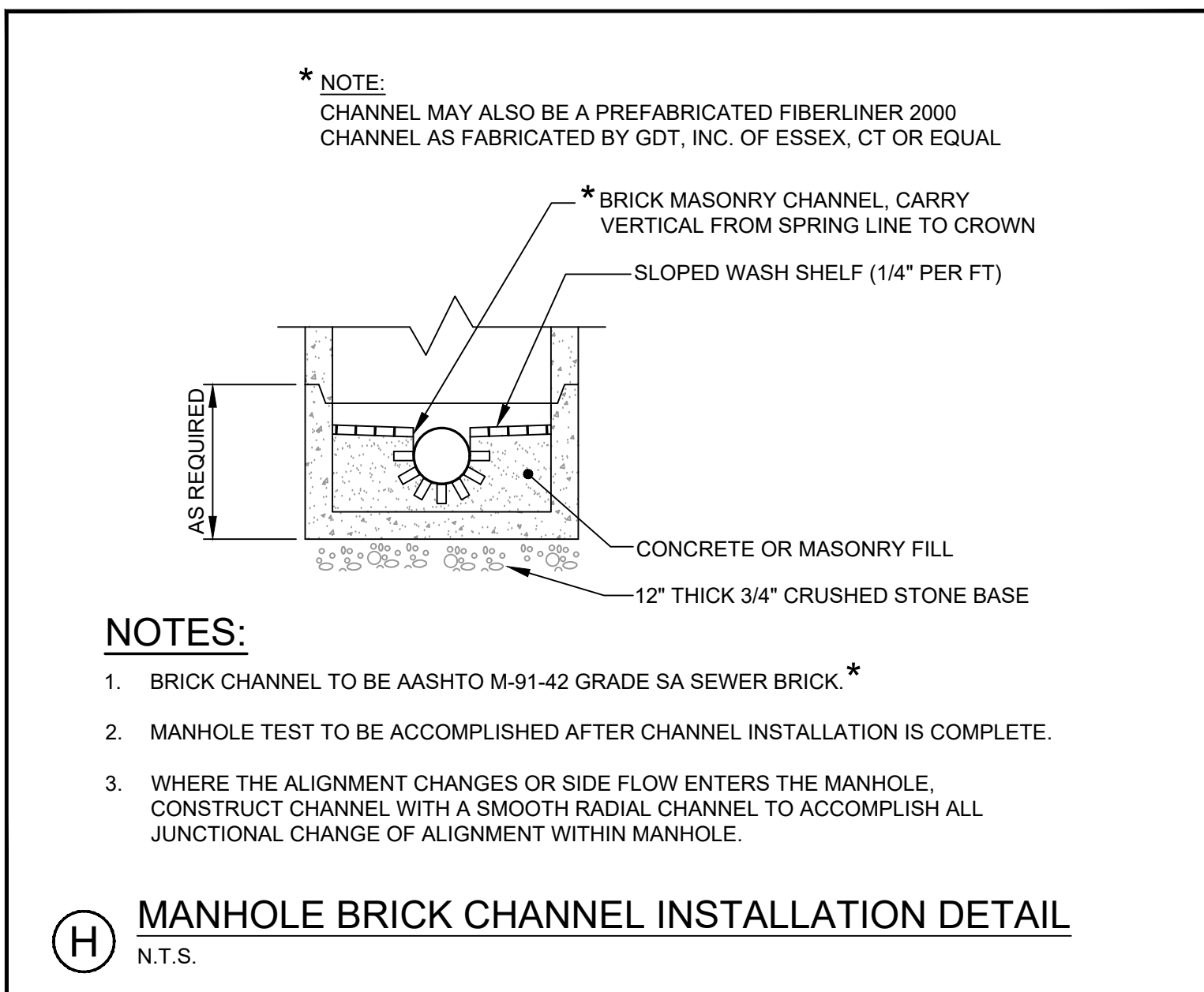
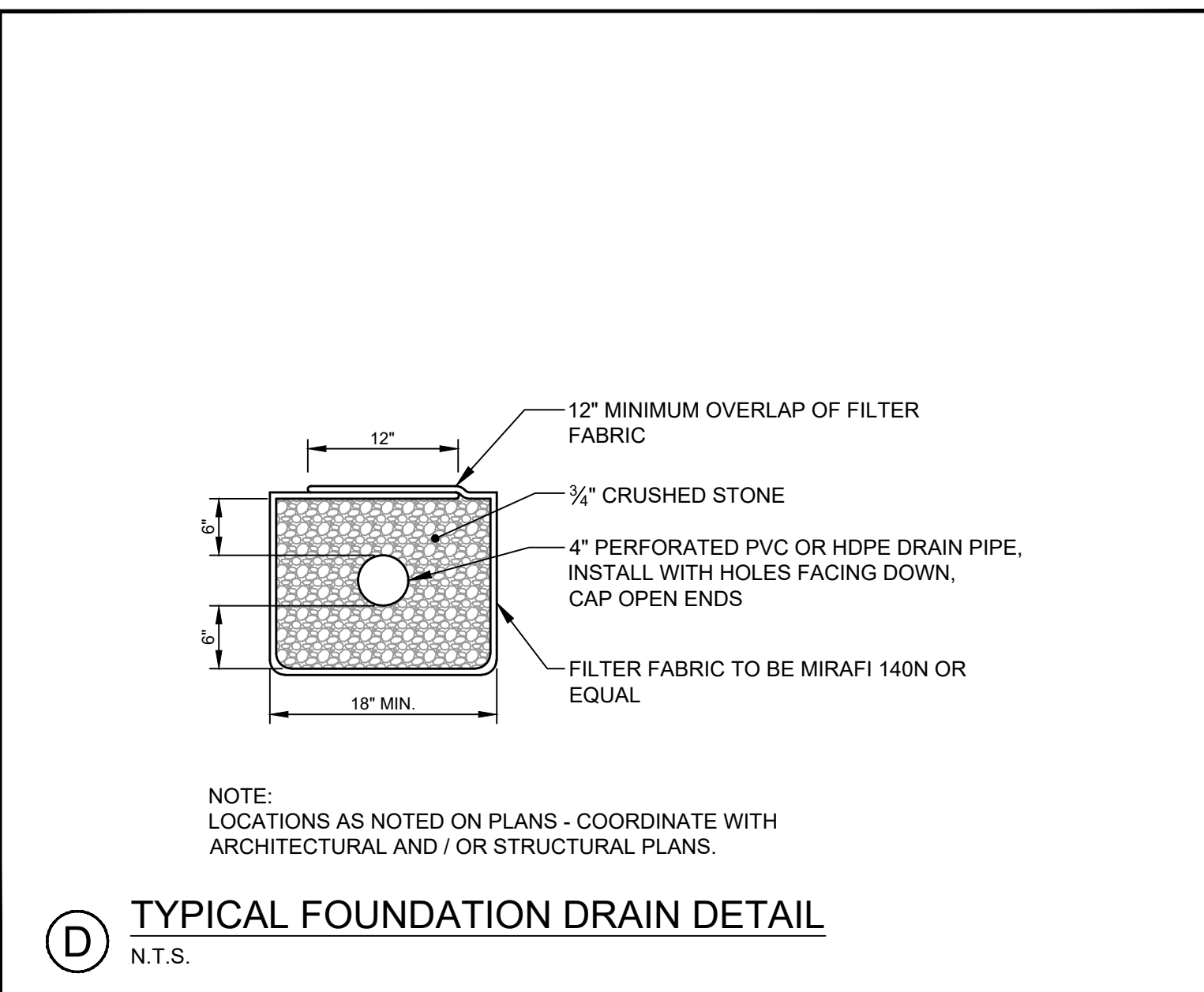
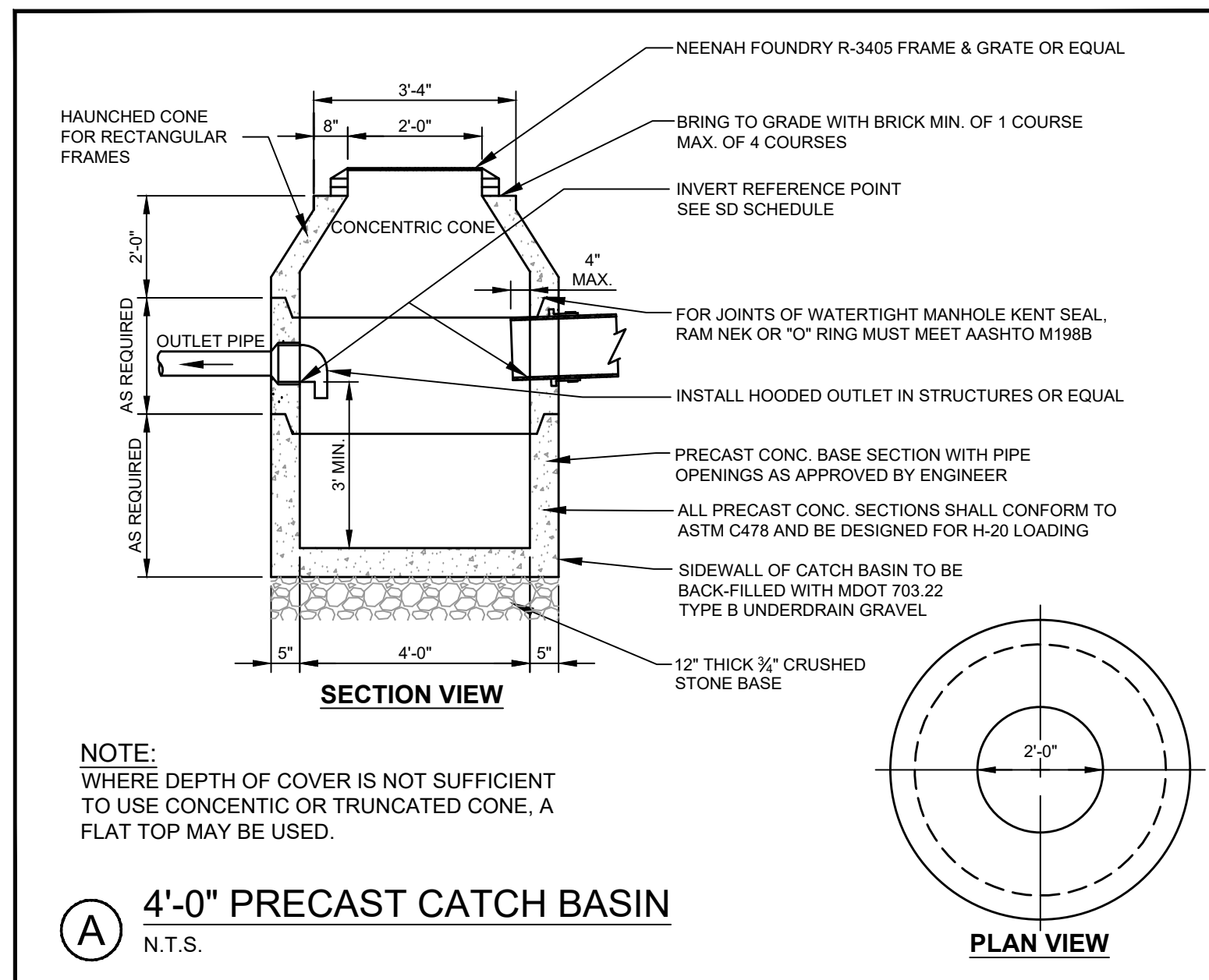
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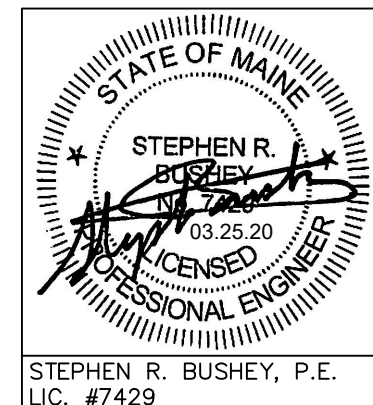
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Drawing Name:	UTILITY PROFILES
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-12.1
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RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

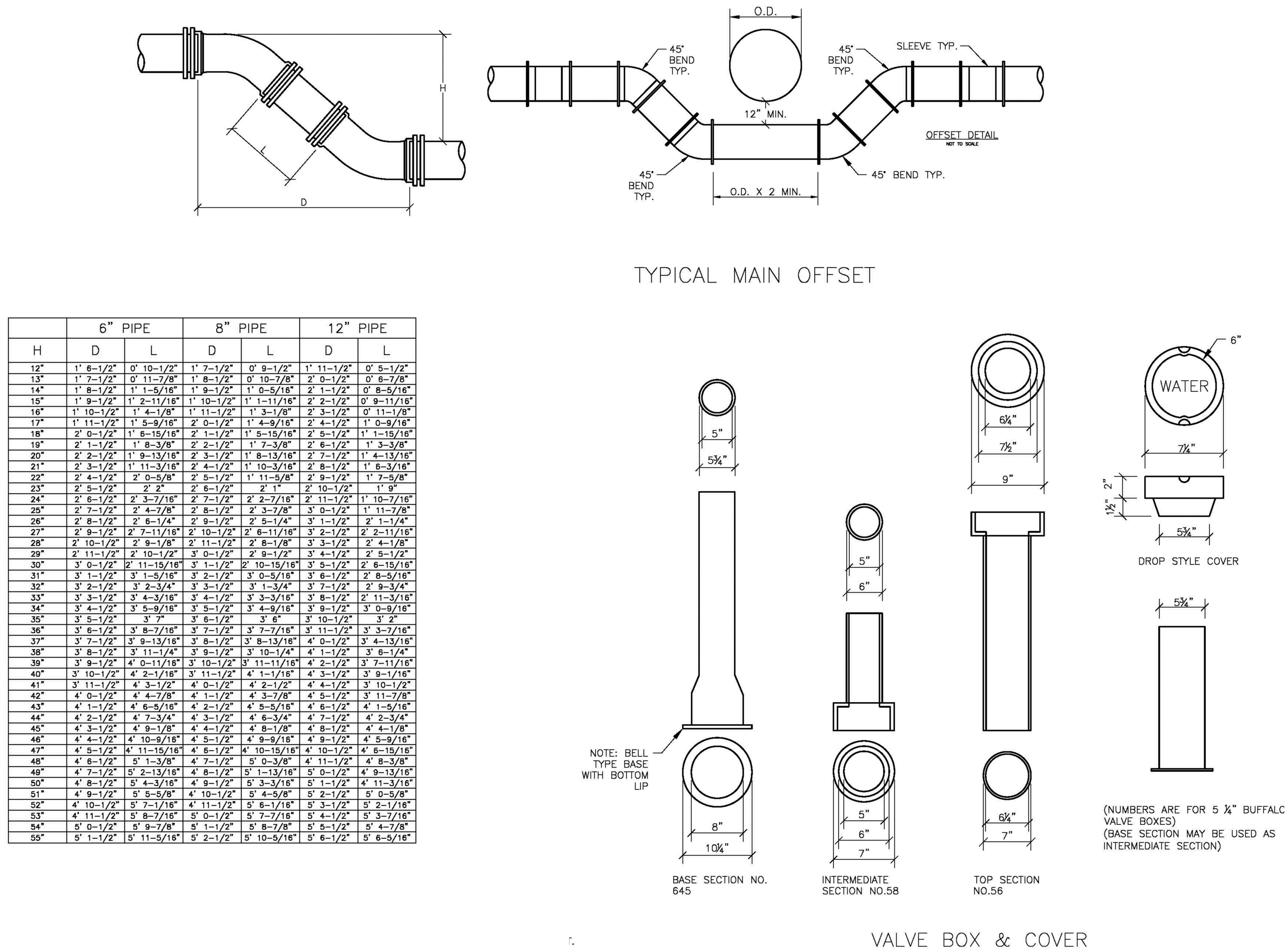
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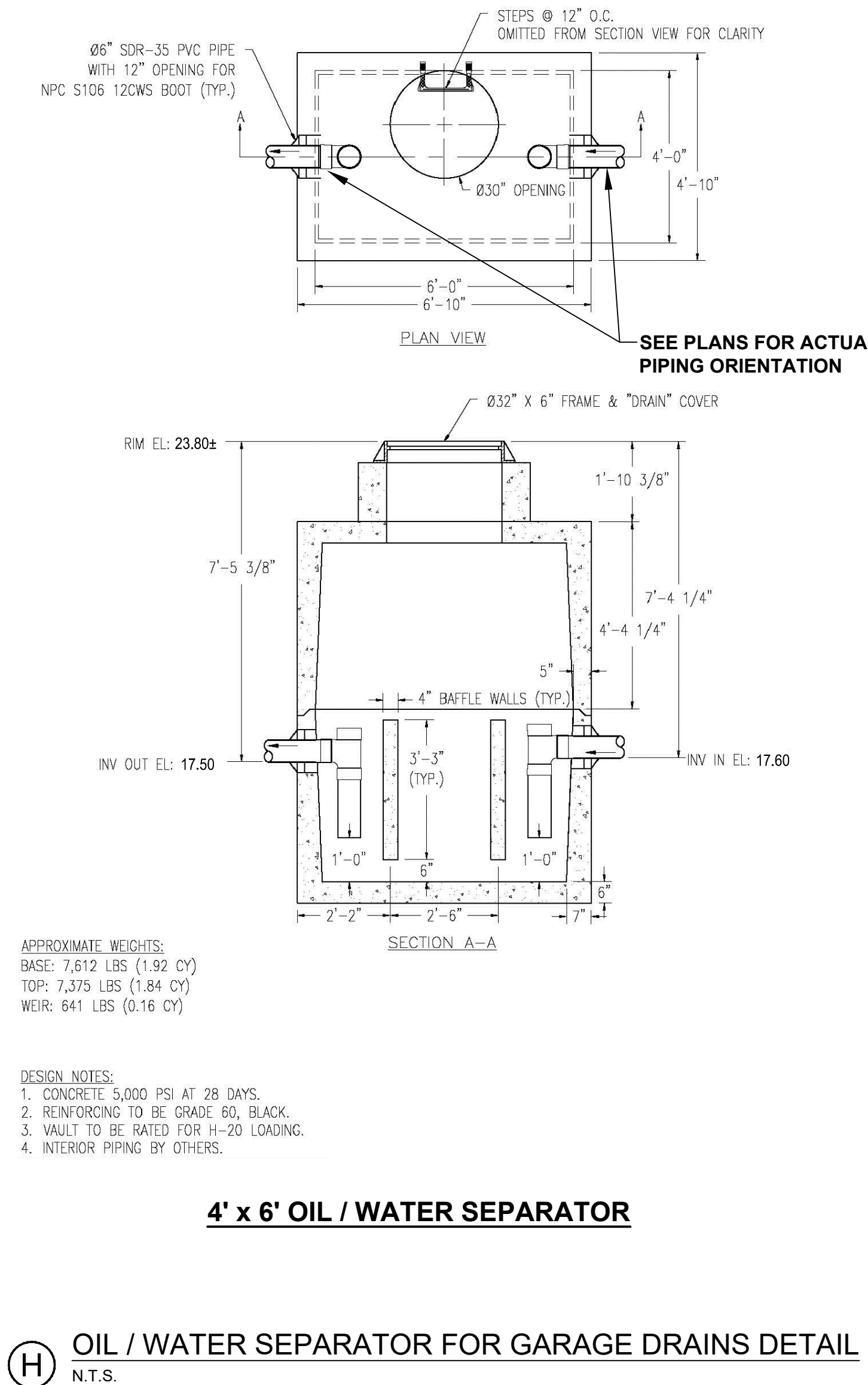
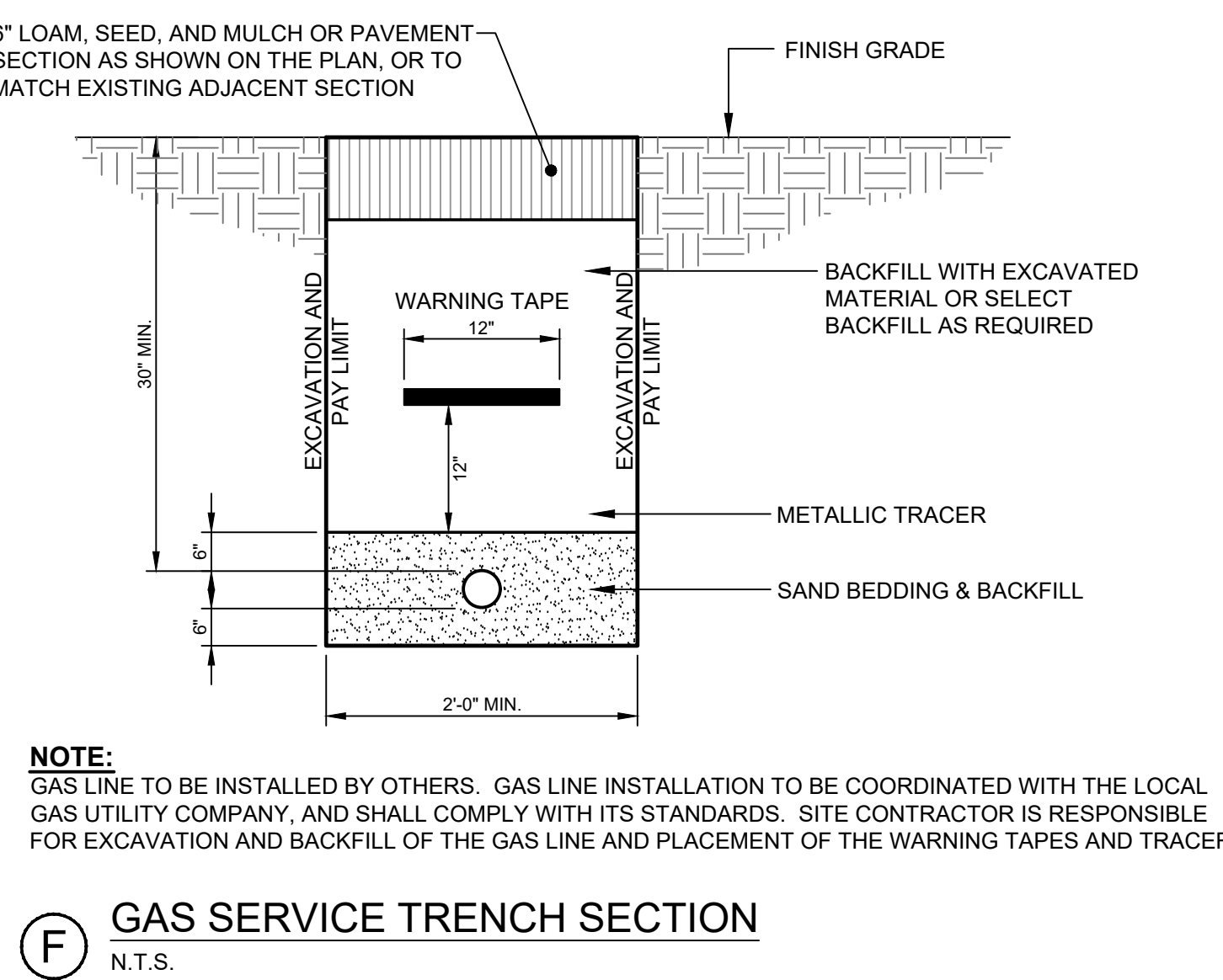
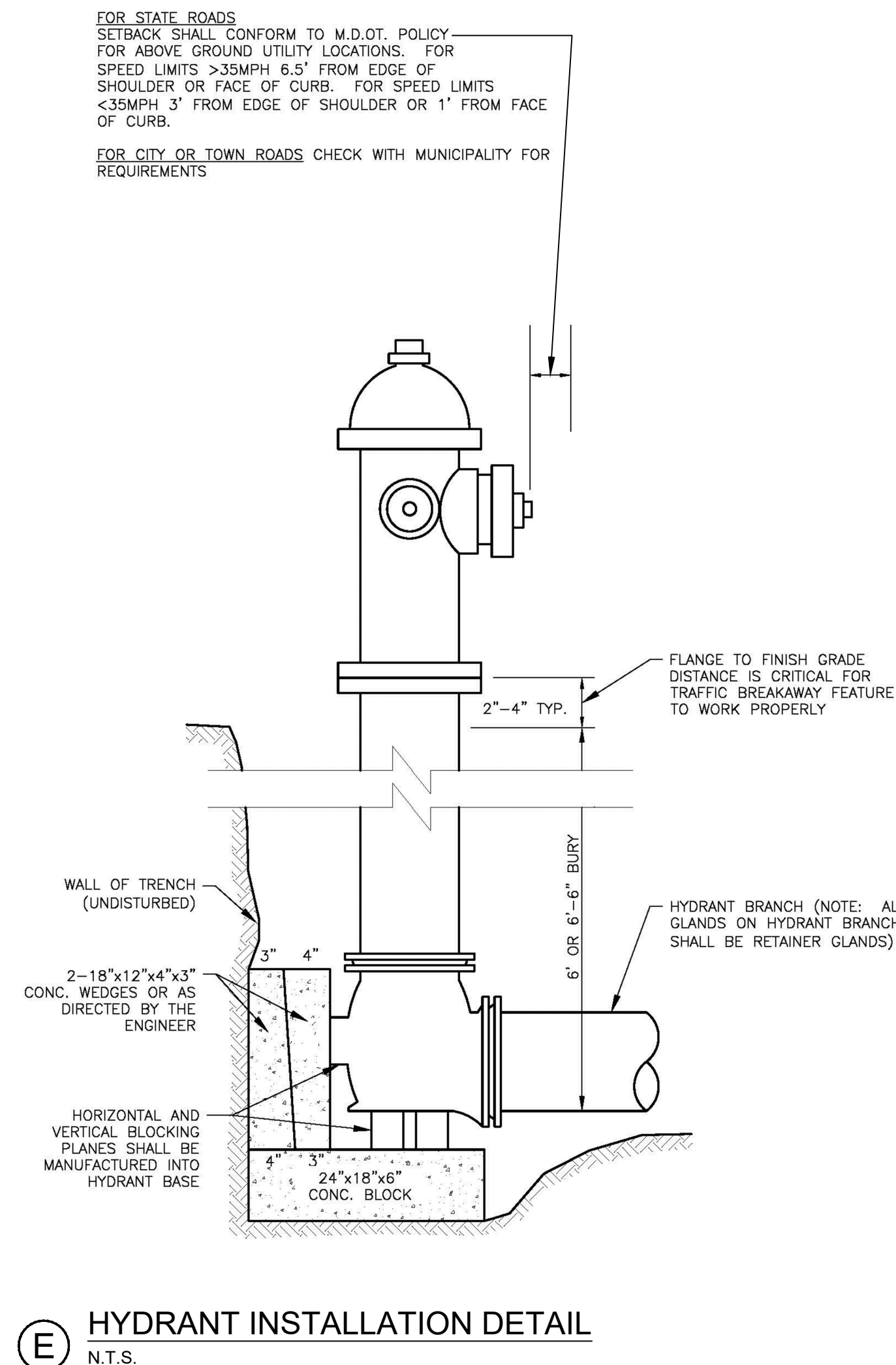
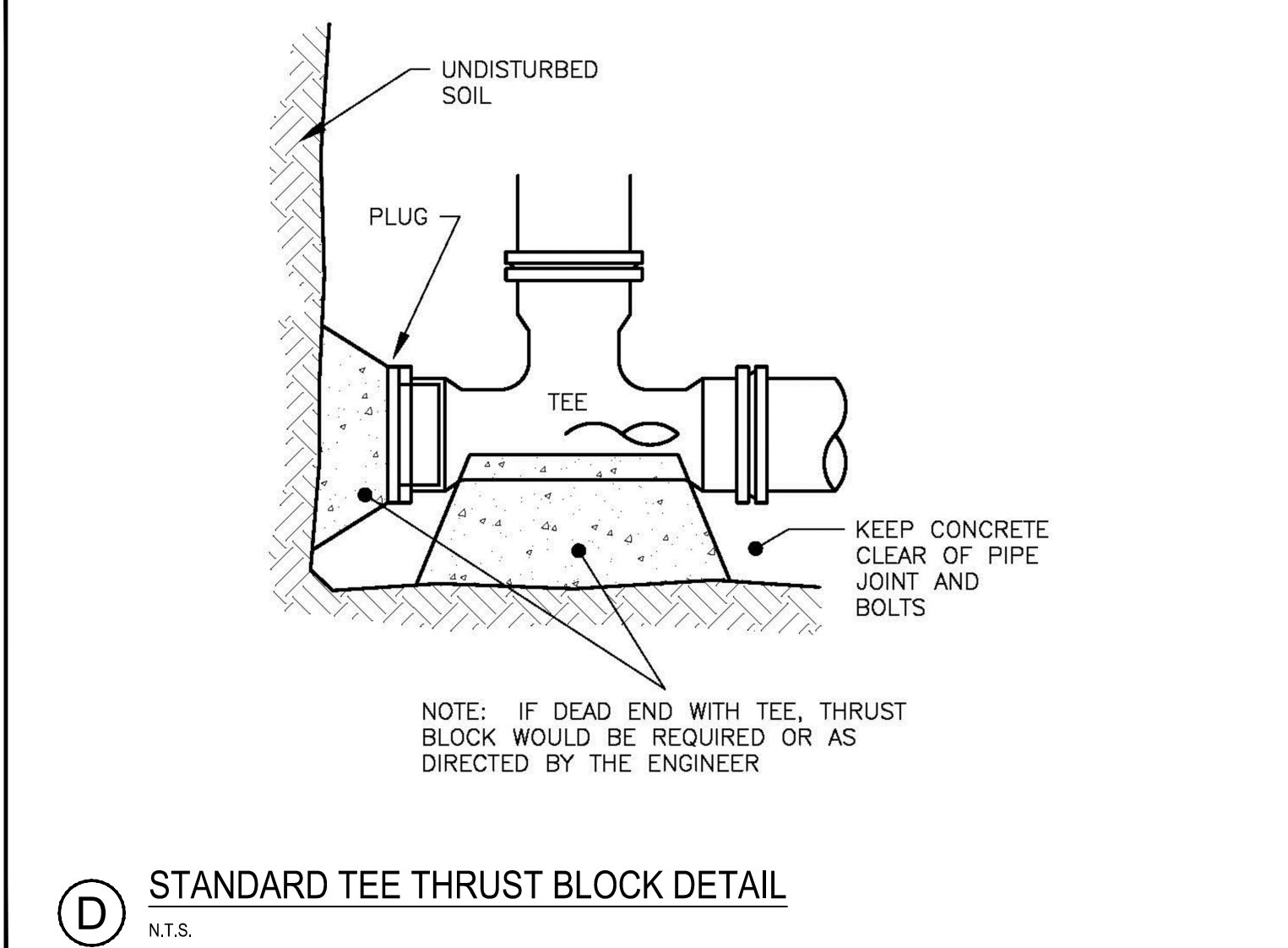
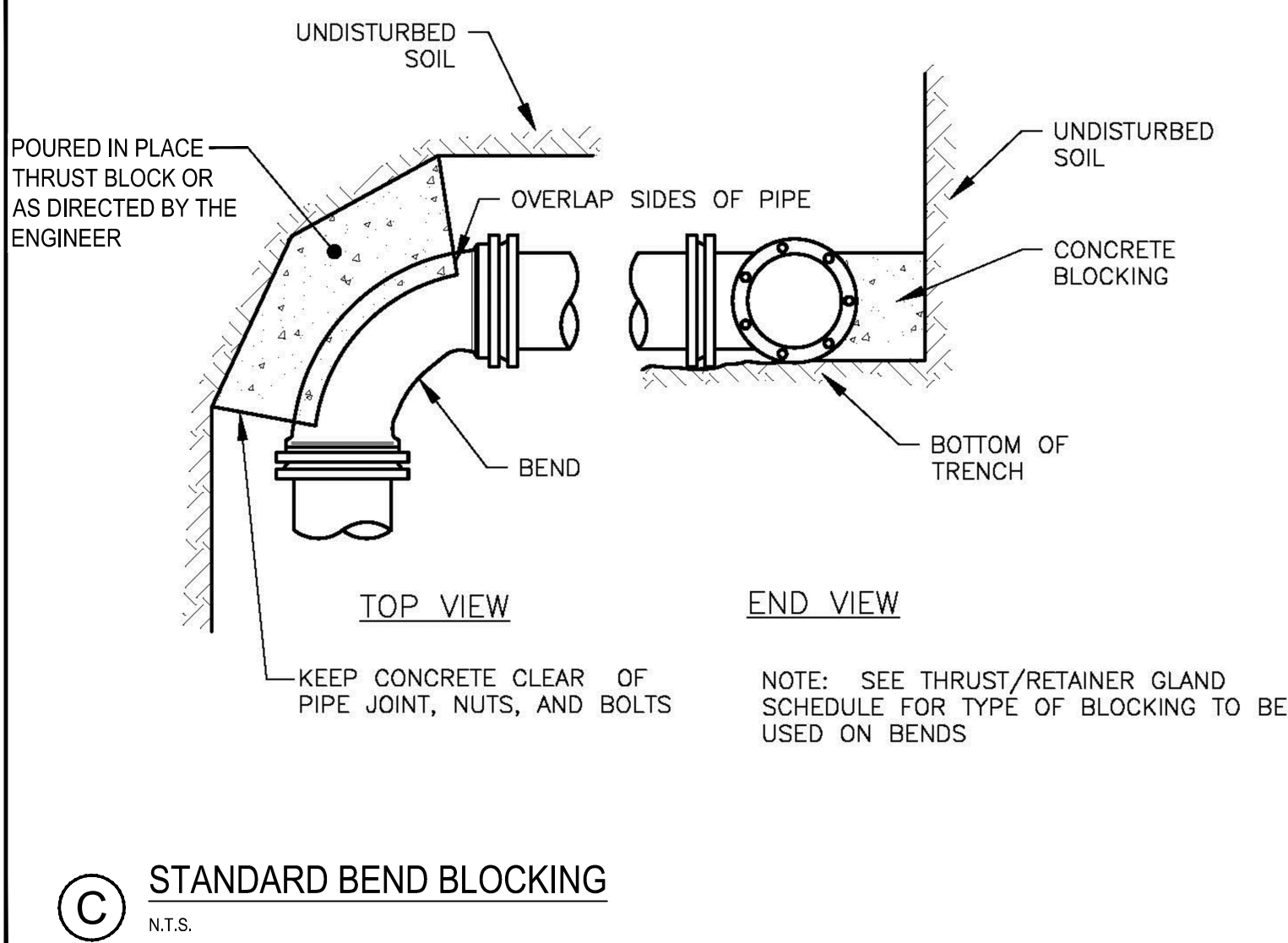
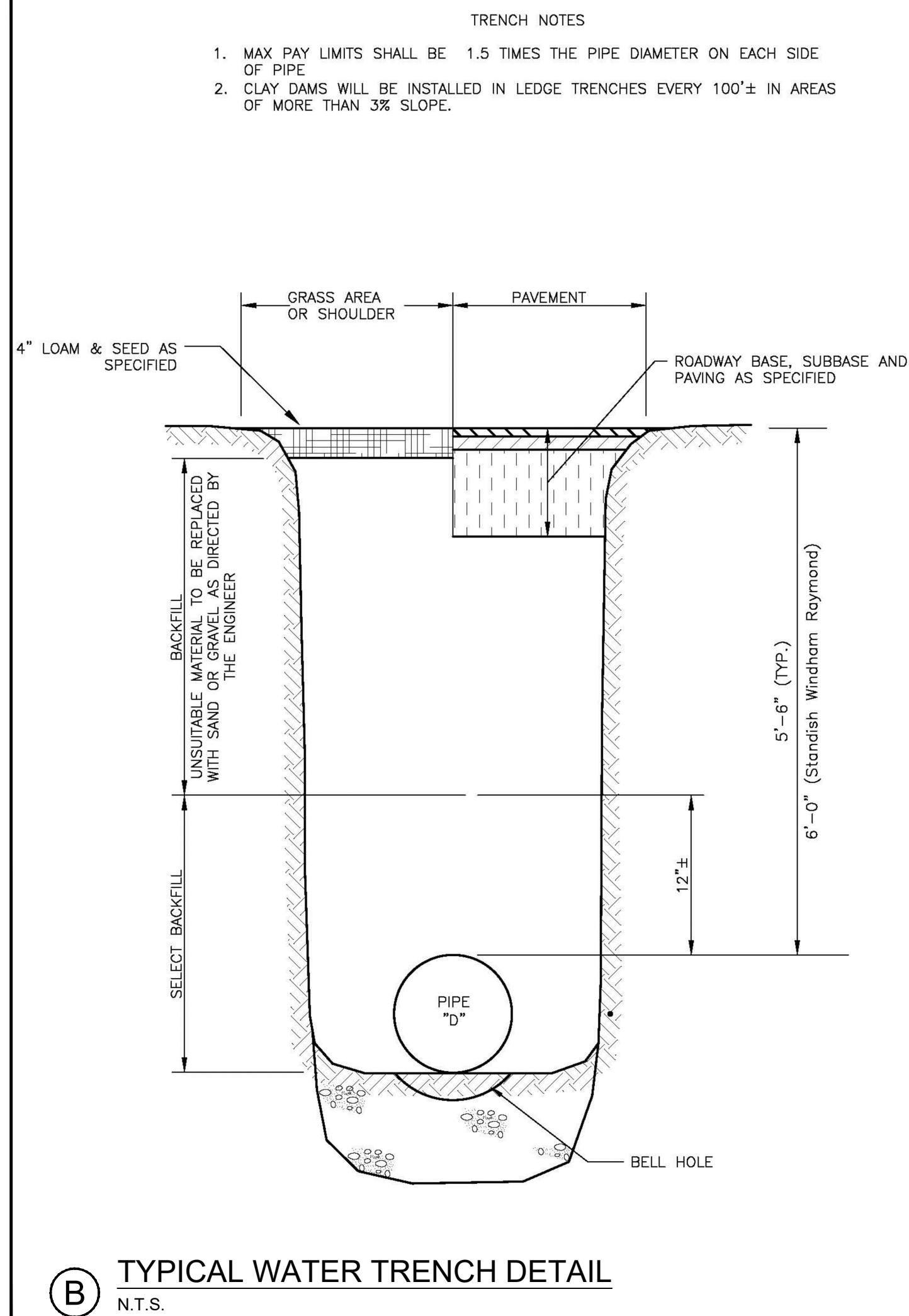
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Drawing Name:	STORM DRAIN & UTILITY DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-10.2
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(A) STANDARD WATER DETAILS
N.T.S.



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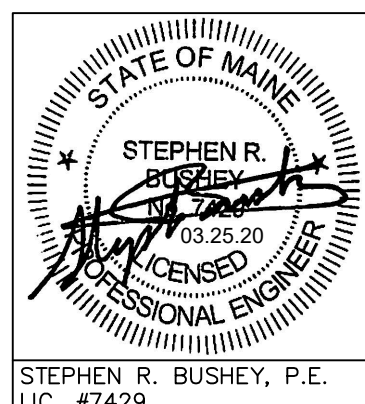
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Drawing Name:	STORM DRAIN & UTILITY DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

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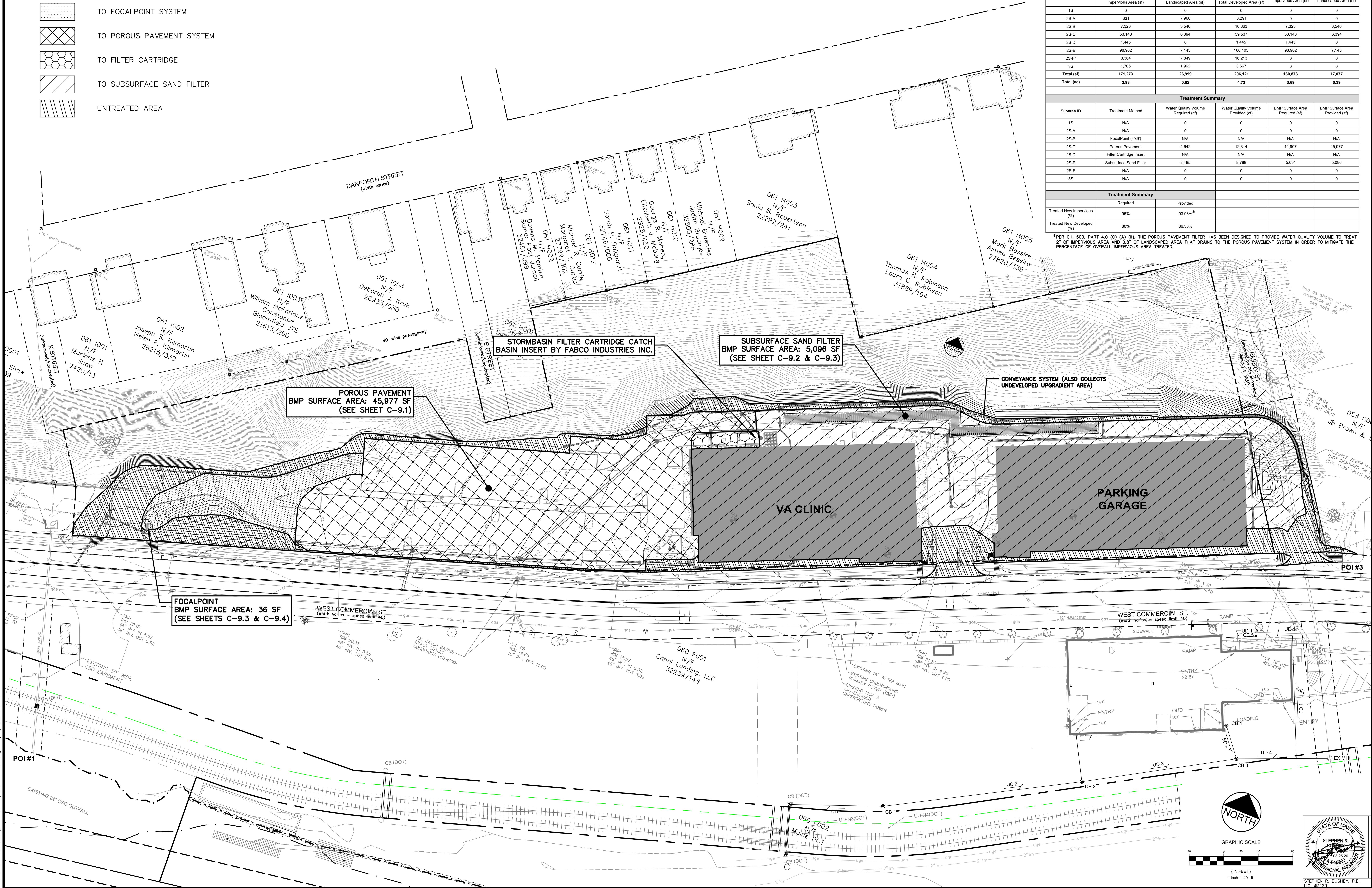
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STORMWATER TREATMENT METHOD LEGEND

- TO FOCALPOINT SYSTEM
- TO POROUS PAVEMENT SYSTEM
- TO FILTER CARTRIDGE
- TO SUBSURFACE SAND FILTER
- UNTREATED AREA

VA Clinic - Stormwater Management Summary					
Designed By: KAB					
Checked By: BSB					
Subarea ID	New Development			Treated New Impervious Area (sf)	Treated New Landscaped Area (sf)
	Impervious Area (sf)	Landscaped Area (sf)	Total Developed Area (sf)		
1S	0	0	0	0	0
2S-A	331	7,960	8,291	0	0
2S-B	7,323	3,540	10,863	7,323	3,540
2S-C	53,143	6,394	59,537	53,143	6,394
2S-D	1,445	0	1,445	1,445	0
2S-E	98,962	7,143	106,105	98,962	7,143
2S-F	8,364	7,849	16,213	0	0
3S	1,705	1,962	3,667	0	0
Total (sf)	171,273	26,999	208,272	160,873	17,077
Total (ac)	3.93	0.62	4.73	3.69	0.39
Treatment Summary					
Subarea ID	Treatment Method	Water Quality Volume Required (cf)	Water Quality Volume Provided (cf)	BMP Surface Area Required (sf)	BMP Surface Area Provided (sf)
1S	N/A	0	0	0	0
2S-A	N/A	0	0	0	0
2S-B	FocalPoint (4'x9')	N/A	N/A	N/A	N/A
2S-C	Porous Pavement	4,642	12,314	11,907	45,977
2S-D	Filter Cartridge Insert	N/A	N/A	N/A	N/A
2S-E	Subsurface Sand Filter	8,485	8,788	5,091	5,096
2S-F	N/A	0	0	0	0
3S	N/A	0	0	0	0
Treatment Summary					
Required		Provided			
Treated New Impervious (%)		95%		93.93%*	
Treated New Developed (%)		80%		86.33%	

*PER CH. 500, PART 4.C (3) (A) (i), THE POROUS PAVEMENT FILTER HAS BEEN DESIGNED TO PROVIDE WATER QUALITY VOLUME TO TREAT 2" OF IMPERVIOUS AREA AND 0.8" OF LANDSCAPED AREA THAT DRAINS TO THE POROUS PAVEMENT SYSTEM IN ORDER TO MITIGATE THE PERCENTAGE OF OVERALL IMPERVIOUS AREA TREATED.



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TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

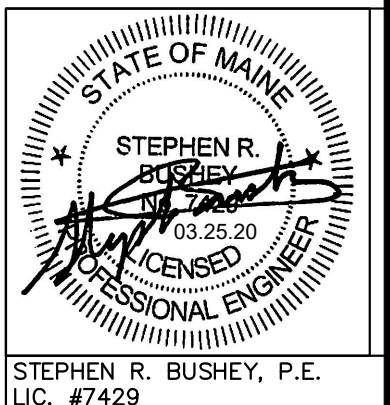
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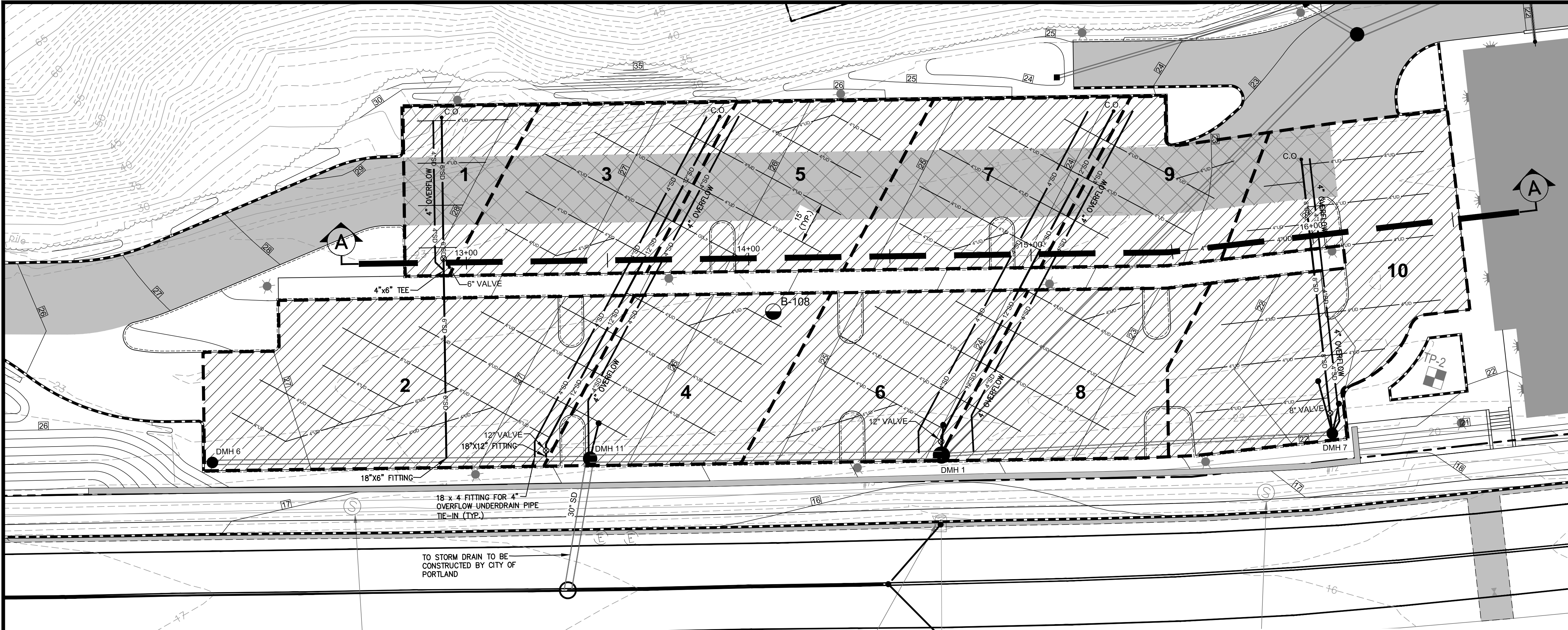


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Drawing Name:	STORMWATER MANAGEMENT PLAN
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

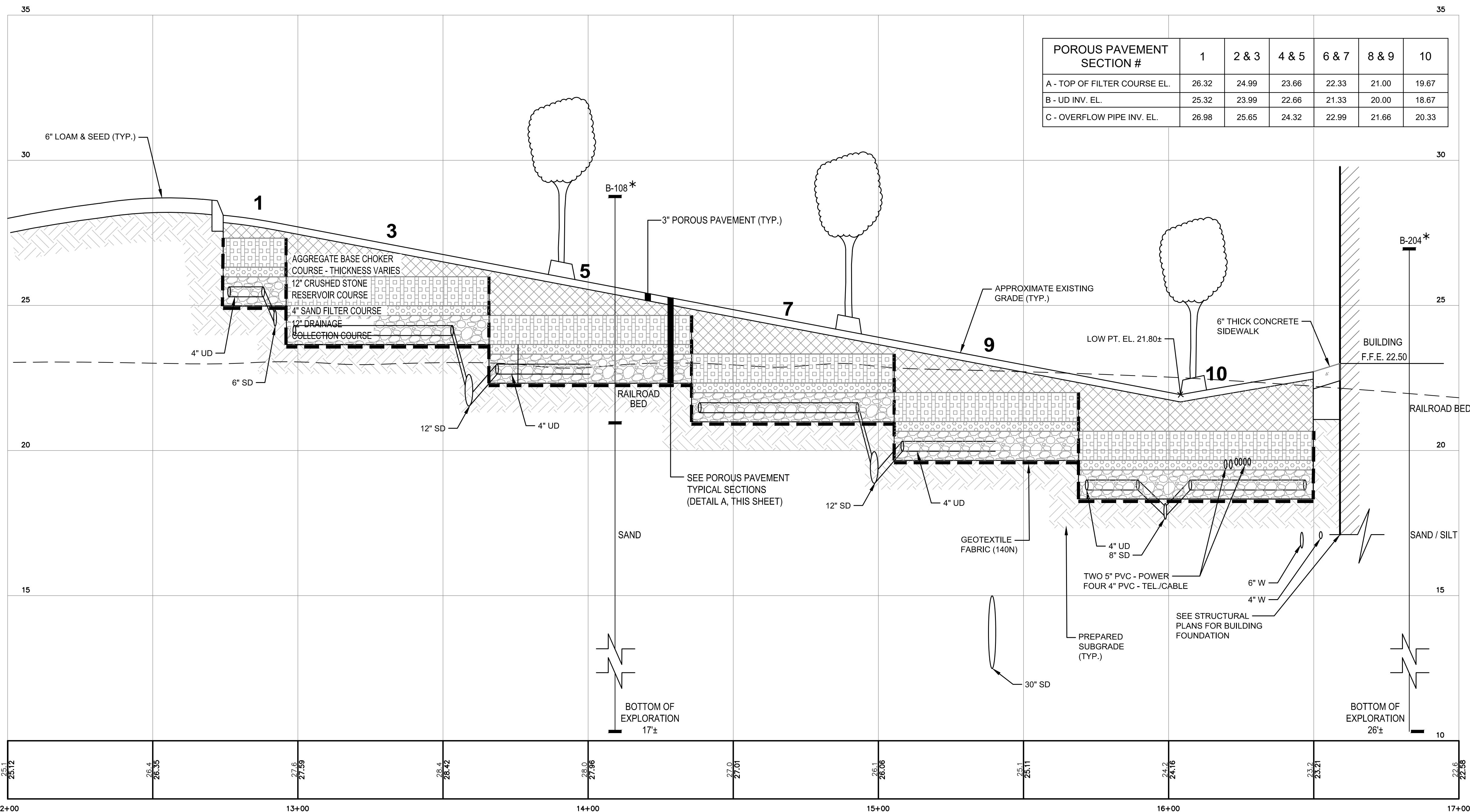
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POROUS PAVEMENT PLAN VIEW

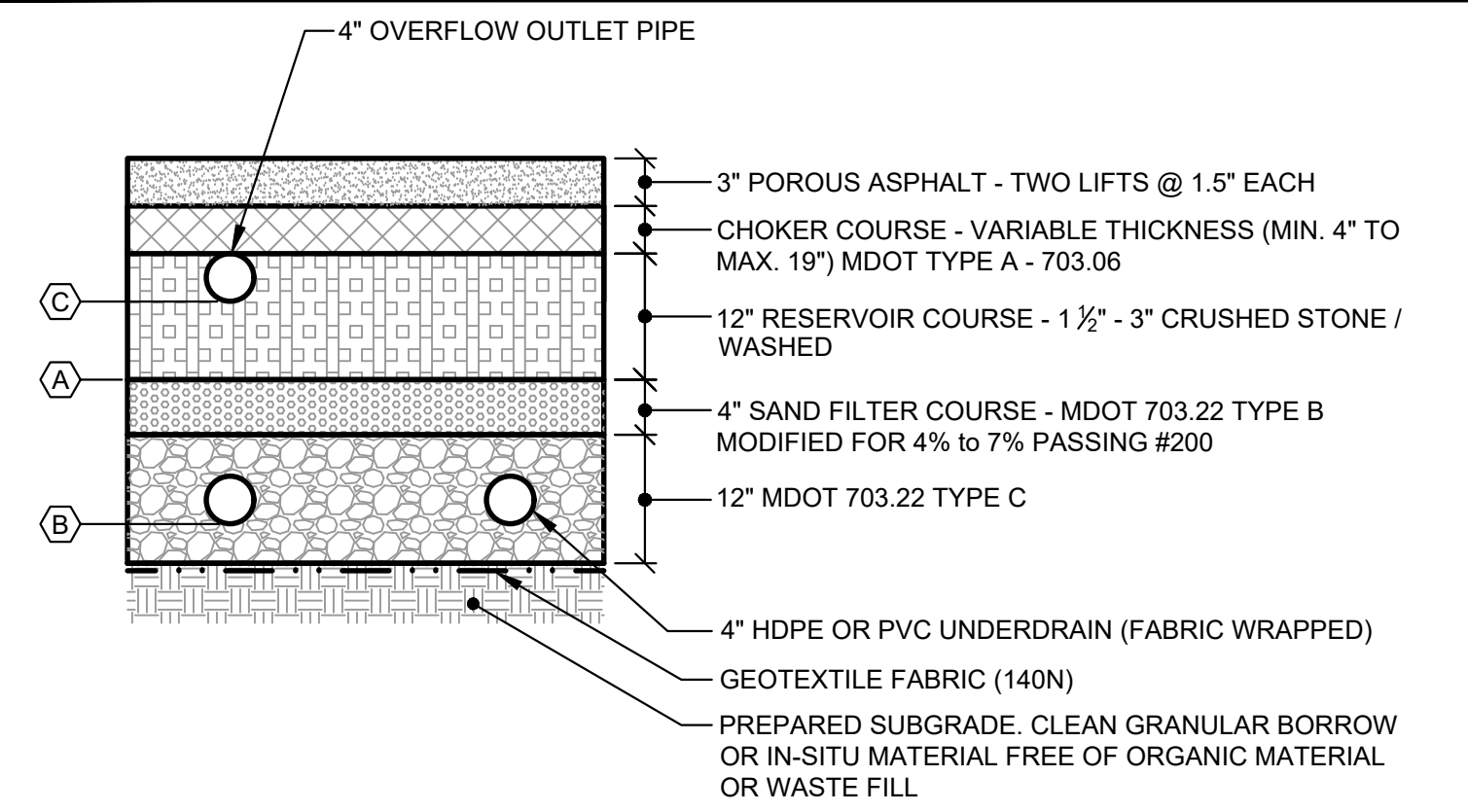
SCALE: 1" = 20'



POROUS PAVEMENT SECTION A-A VIEW

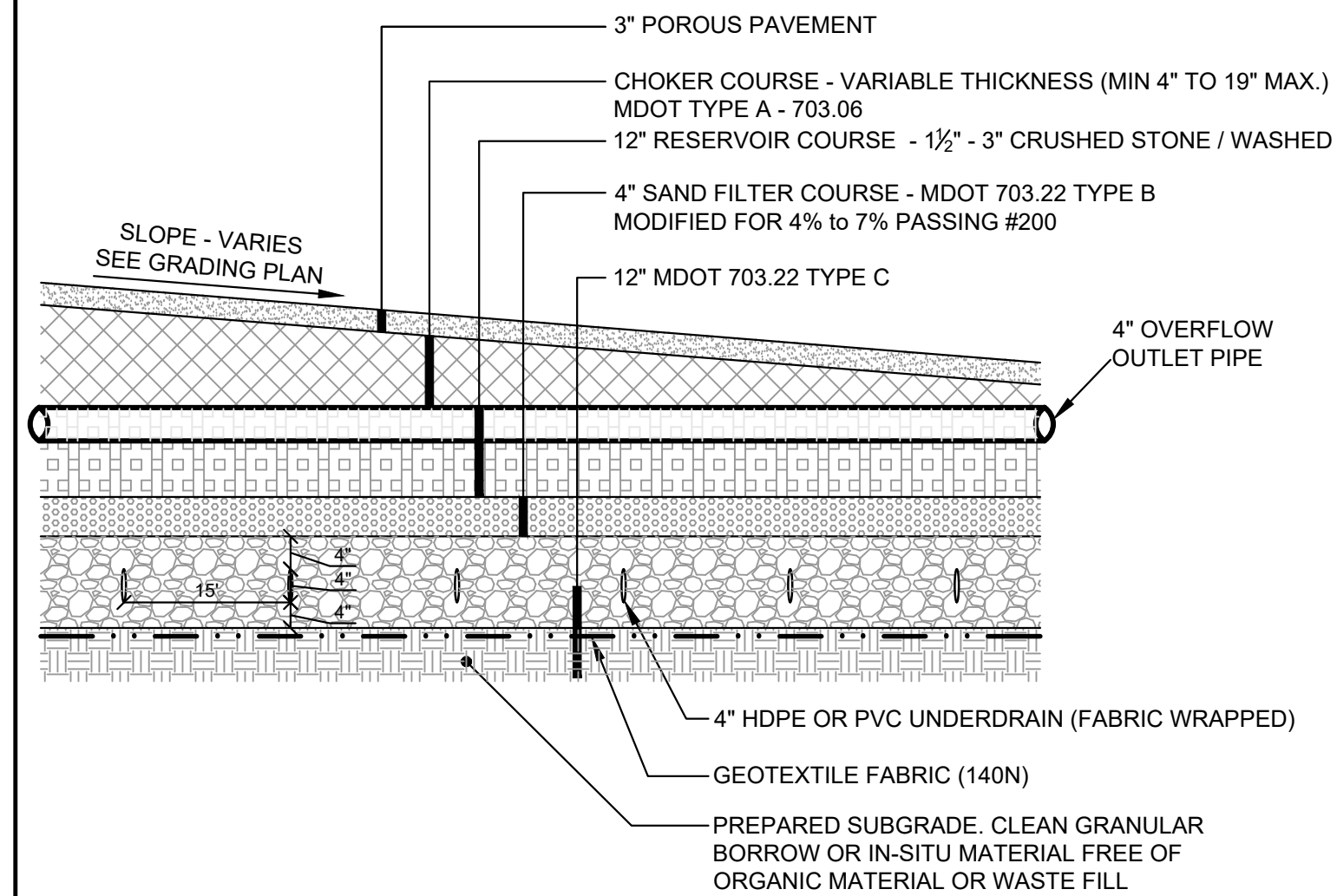
SCALE: 1" = 20' HORIZ. / 1" = 2' VERT.

POROUS PAVEMENT SECTION #	1	2 & 3	4 & 5	6 & 7	8 & 9	10
A - TOP OF FILTER COURSE EL.	26.32	24.99	23.66	22.33	21.00	19.67
B - UD INV. EL.	25.32	23.99	22.66	21.33	20.00	18.67
C - OVERFLOW PIPE INV. EL.	26.98	25.65	24.32	22.99	21.66	20.33



NOTES:

- ALL MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST REVISION. COMPACTION OF ALL MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE GEOTECHNICAL REPORT.
- OUTFLOW FROM THE POROUS PAVEMENT AREAS SHALL BE CONTROLLED BY A DUCTILE IRON GATE VALVE WITH A VALVE WRENCH AND EXTENSION. A THREE PIECE VALVE BOX SHALL BE INSTALLED OVER THE VALVE. (SEE PLAN VIEW FOR GATE VALVE SIZING)
- UPON COMPLETION OF THE INSTALLATION OF THE POROUS PAVEMENT FILTER SECTION, THE CONTRACTOR SHALL FLOOD THE POROUS PAVEMENT AREAS TO THE DESIGN ELEVATION WITH CLEAN WATER AND ADJUST THE VALVE TO OBTAIN A 24 TO 32 HOUR RELEASE TIME.

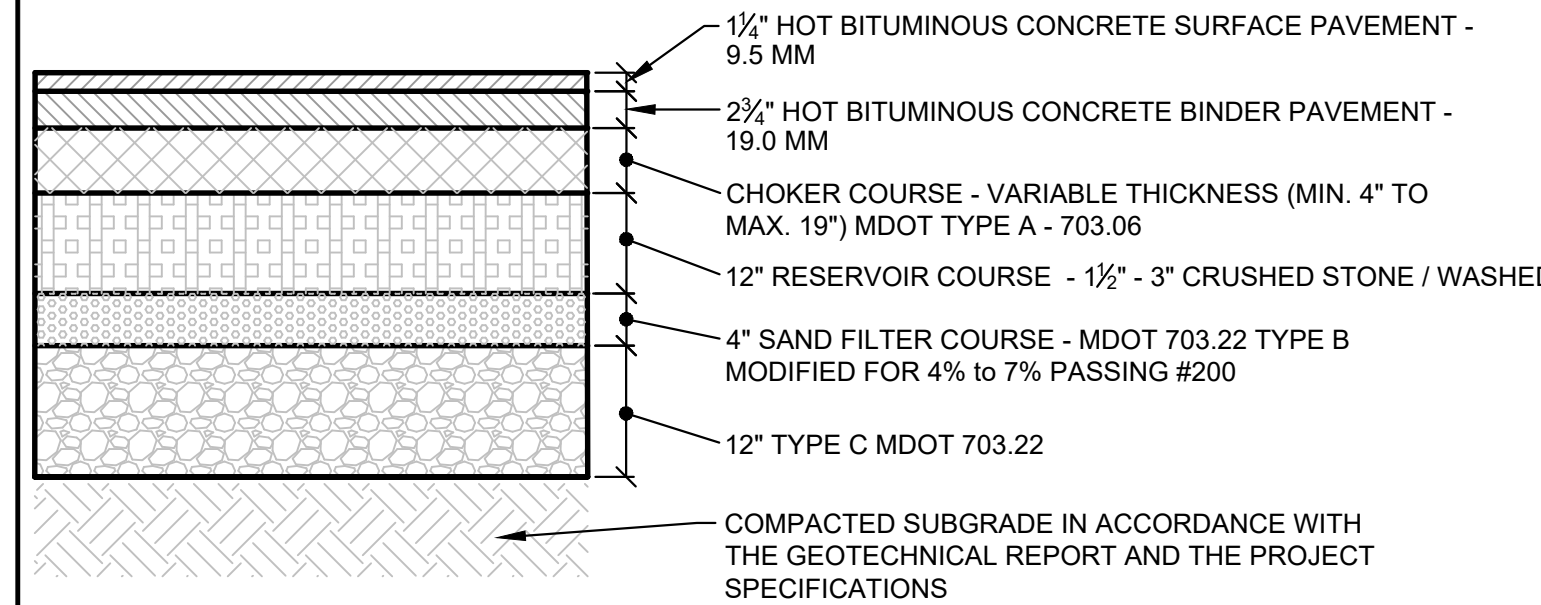


POROUS PAVEMENT TYPICAL SECTIONS

N.T.S.

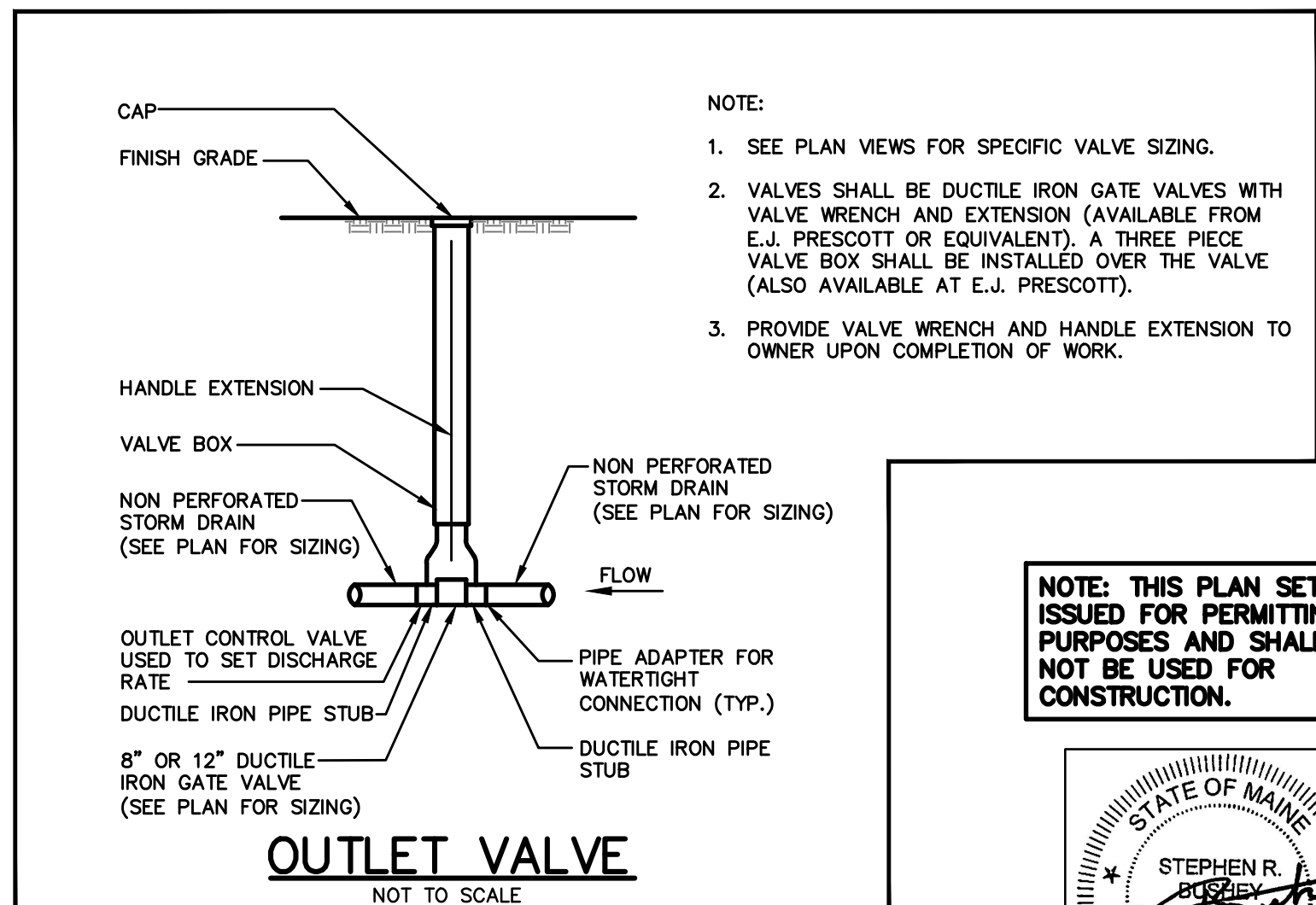
NOTES:

- SEE OVERALL SITE LAYOUT PLAN (SHEET C-4.0) FOR LOCATION(S) OF DIFFERENT PAVEMENT TYPES.
- APPLY TACK COAT BETWEEN BINDER AND SURFACE COURSES ON REGULAR PAVEMENT ONLY.
- ALL MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST REVISION. COMPACTION OF ALL MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS AND GEOTECHNICAL REPORTS PREPARED BY THE GEOTECHNICAL ENGINEER, WHICHEVER IS MORE STRINGENT.
- CONTRACTOR SHALL BE REQUIRED TO PROTECT ALL BEARING SOILS FROM EXCESSIVE DISTURBANCE. SHOULD SUBGRADE BECOME YIELDING OR DIFFICULT TO WORK, DISTURBED AREAS SHOULD BE EXCAVATED AND COMPACTED WITH SELECT GRANULAR FILL OR CRUSHED STONE AT NO EXTRA EXPENSE TO THE OWNER. WOVEN GEOTEXTILE TENSILE FABRIC (MIRAFI 600X OR EQUAL) SHALL BE PLACED OVER UNSUITABLE SUBGRADE AS DIRECTED BY THE OWNER'S REPRESENTATIVE, AT NO EXTRA EXPENSE TO THE OWNER.
- ALL GRAVELS SHALL EXTEND A MINIMUM OF 12" BEYOND THE EDGE OF PAVEMENT.



HEAVY DUTY BIT. CONC. w/STONE STORAGE PAVEMENT SECTION

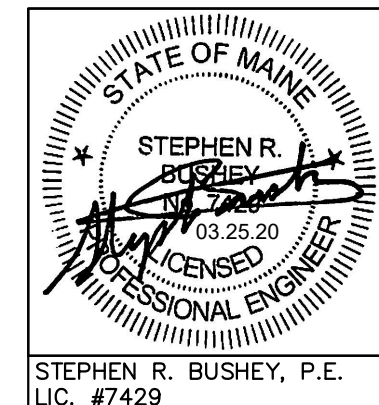
N.T.S.



NOTE:

- SEE PLAN VIEWS FOR SPECIFIC VALVE SIZING.
- VALVES SHALL BE DUCTILE IRON GATE VALVES WITH VALVE WRENCH AND EXTENSION (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT). A THREE PIECE VALVE BOX SHALL BE INSTALLED OVER THE VALVE (ALSO AVAILABLE AT E.J. PRESCOTT).
- PROVIDE VALVE WRENCH AND HANDLE EXTENSION TO OWNER UPON COMPLETION OF WORK.

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TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

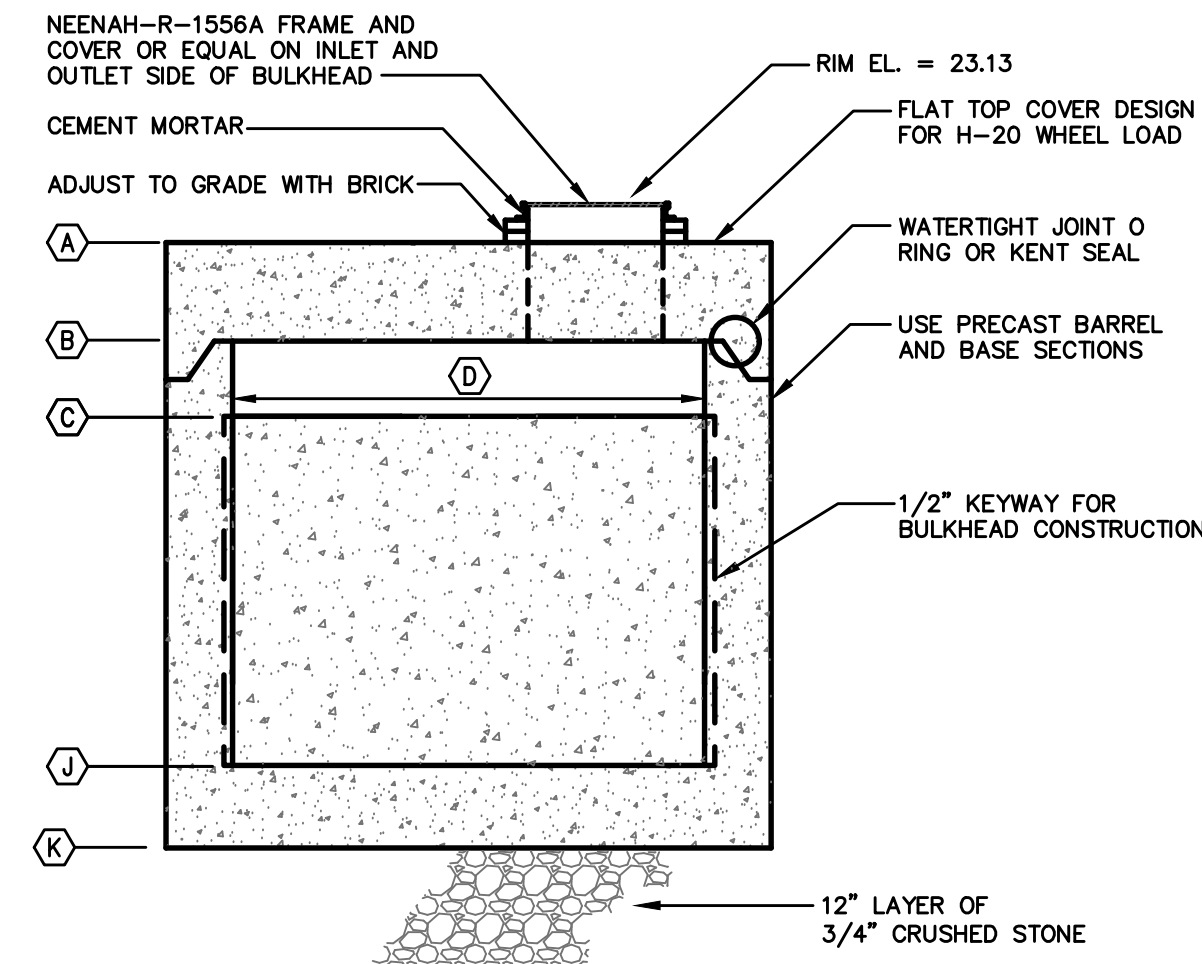
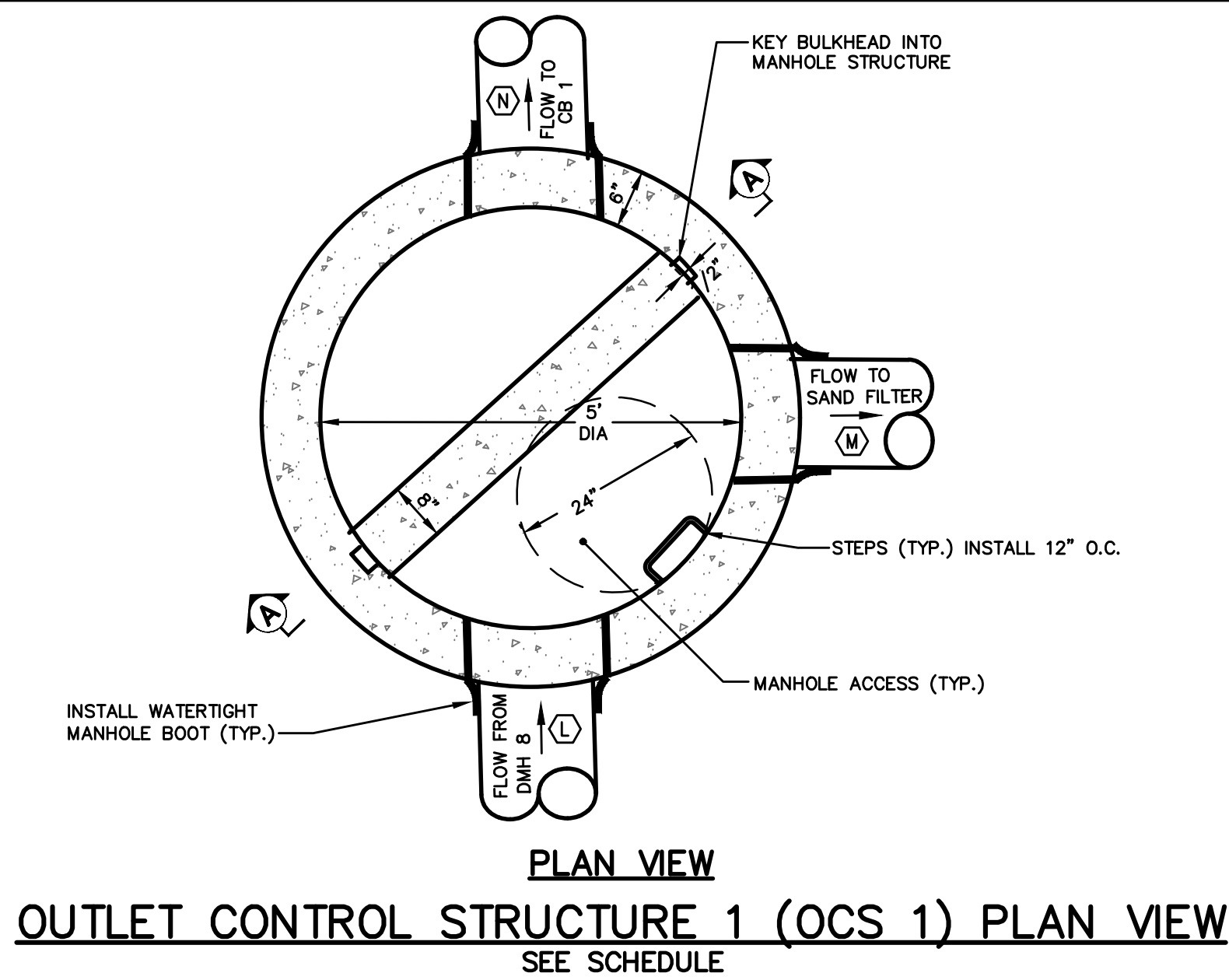
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File Name: 3572-SWM PLAN.dwg		
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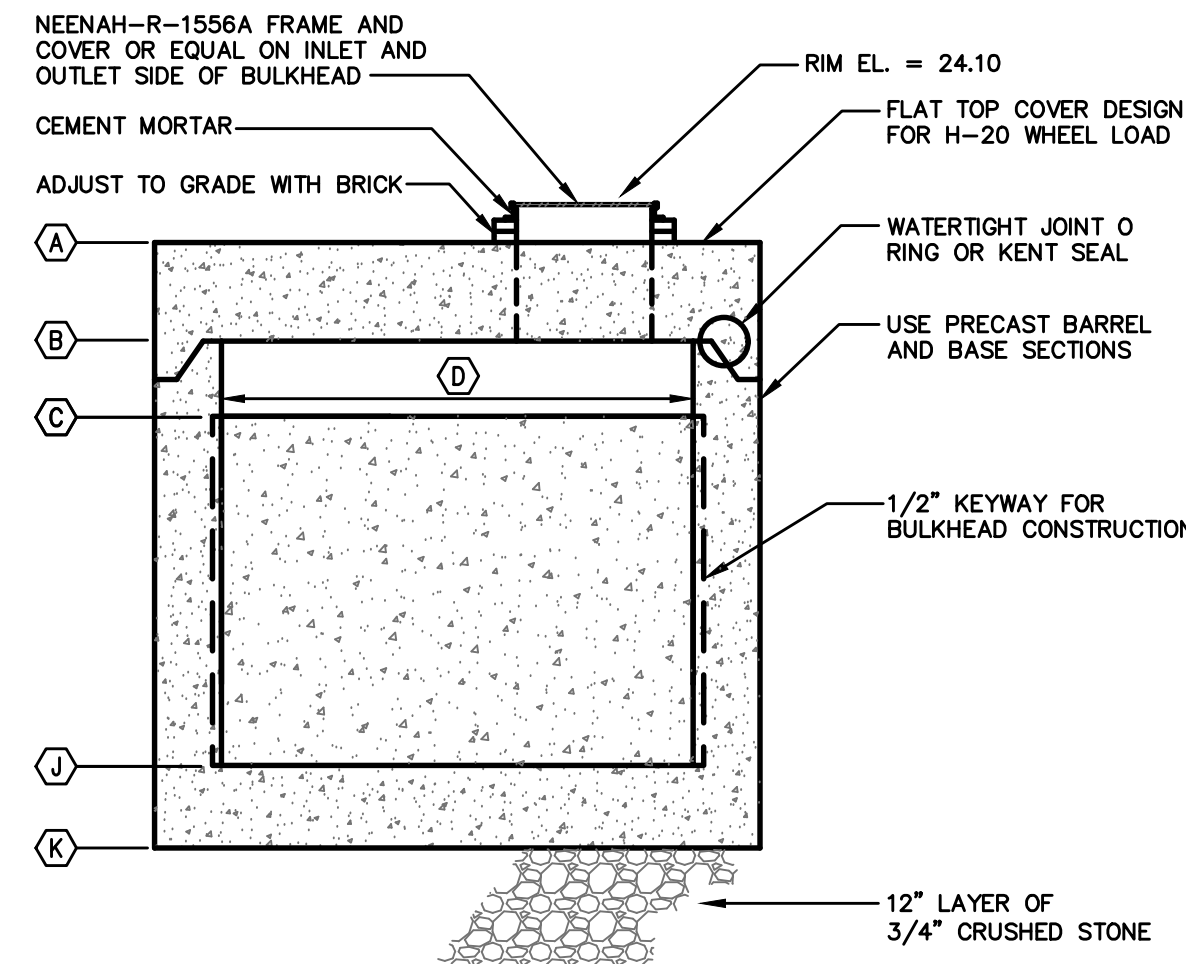
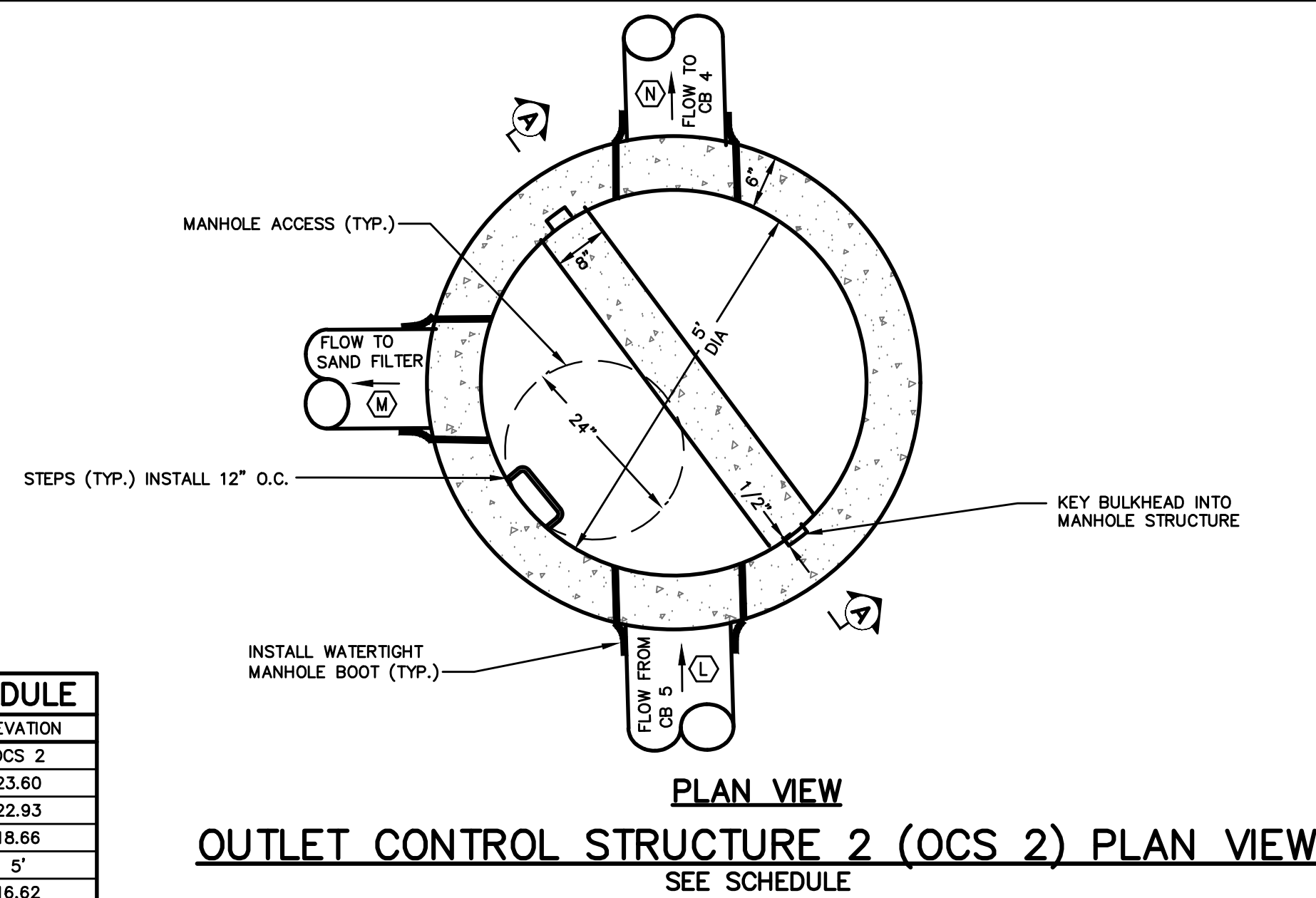
Drawing Name:	STORMWATER MANAGEMENT DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 153 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.
C-9.1

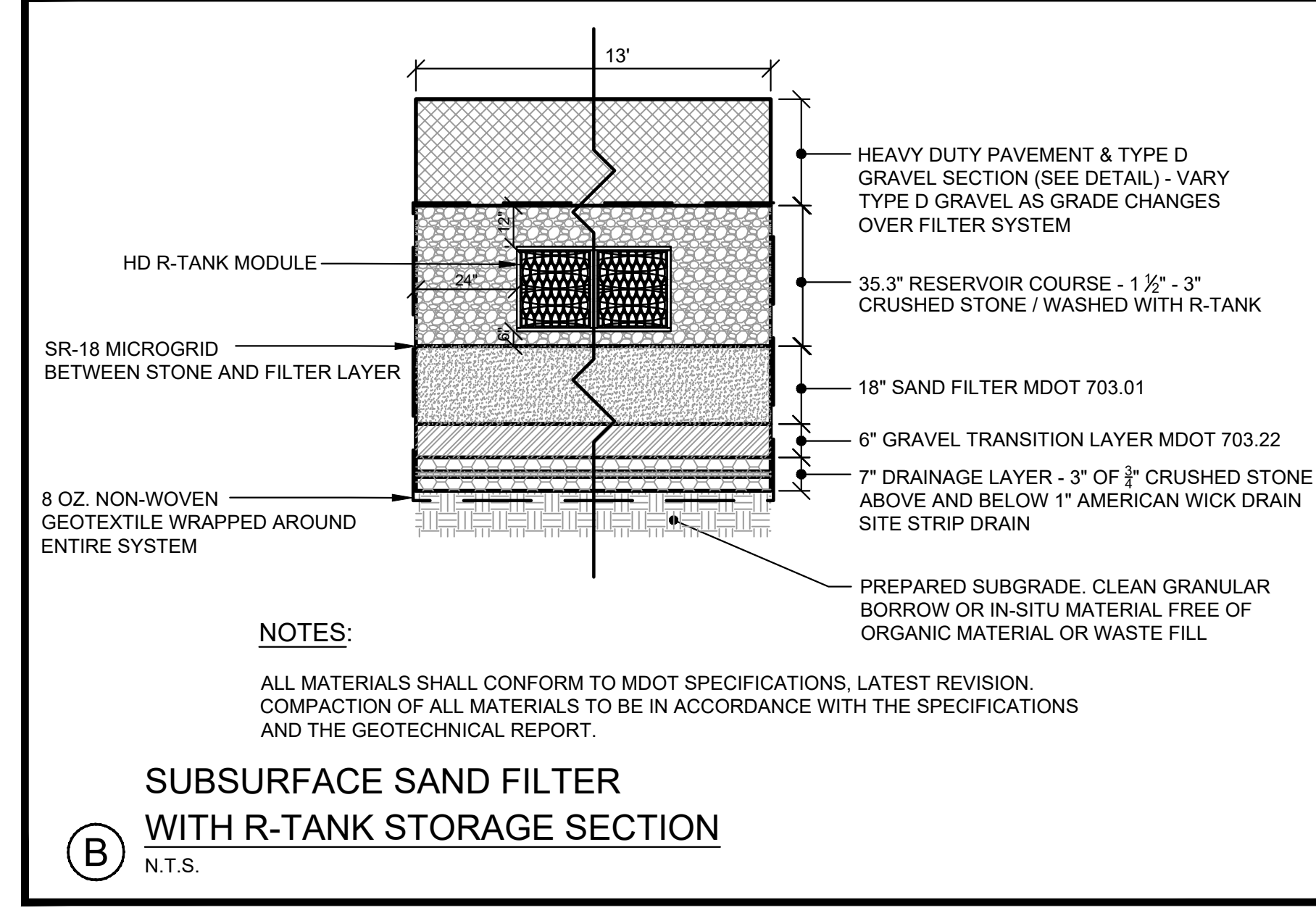


OUTLET CONTROL STRUCTURE DETAILS
N.T.S.

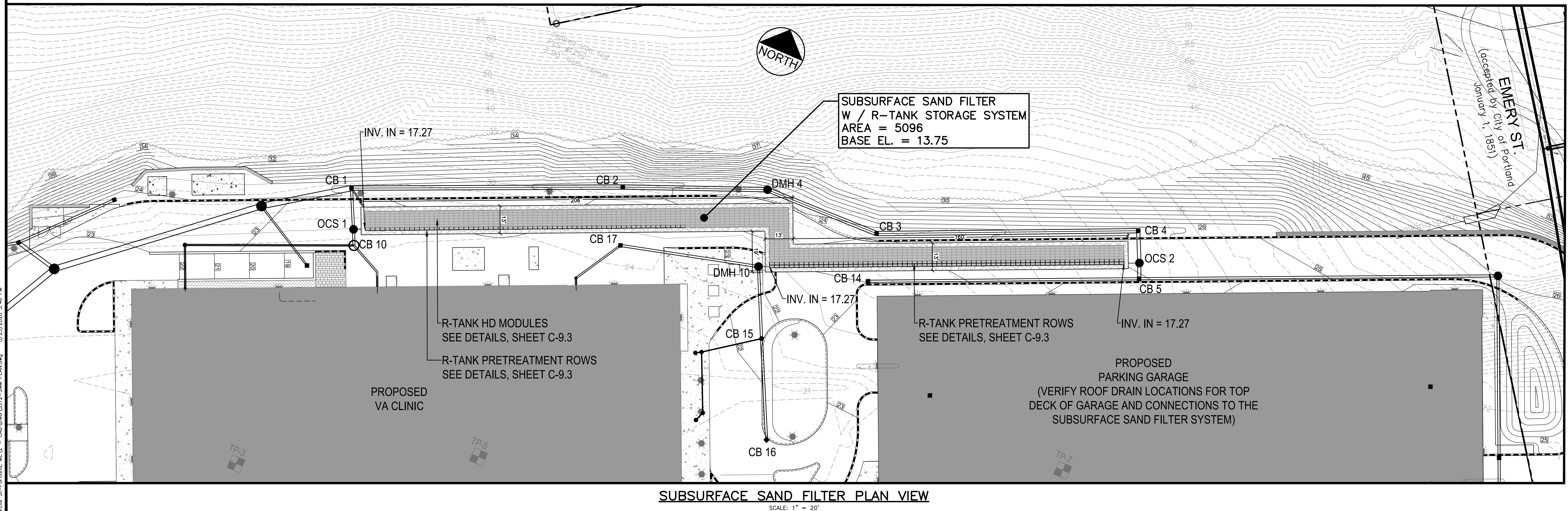
ITEM DESCRIPTION	ELEVATION	ELEVATION
A TOP OF STRUCTURE	22.63	23.60
B UNDERSIDE TOP SLAB	21.96	22.93
C TOP OF CONCRETE BULKHEAD	18.66	18.66
D WEIR LENGTH	5'	5'
J MANHOLE INVERT	16.68	16.62
K BOTTOM OF STRUCTURE	16.01	15.95
L PIPE DIAMETER	12"	18"
M INVERT IN	17.78	17.72
N INVERT OUT	17.68	17.62
O PIPE DIAMETER	12"	18"
P INVERT OUT	18.20	18.20



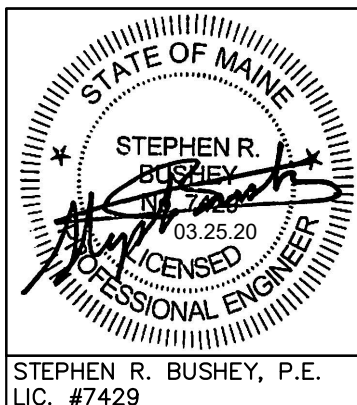
OUTLET CONTROL STRUCTURE DETAILS
N.T.S.



	REQUIRED	PROVIDED
FILTER AREA	5,091 SF	5,096 SF
WATER QUALITY VOLUME	8,485 CF	8,788 CF
PRE-TREATMENT R-TANK MODULES	177	209
PRE-TREATMENT ROWS	3	3
R-TANK MODULES	929	929



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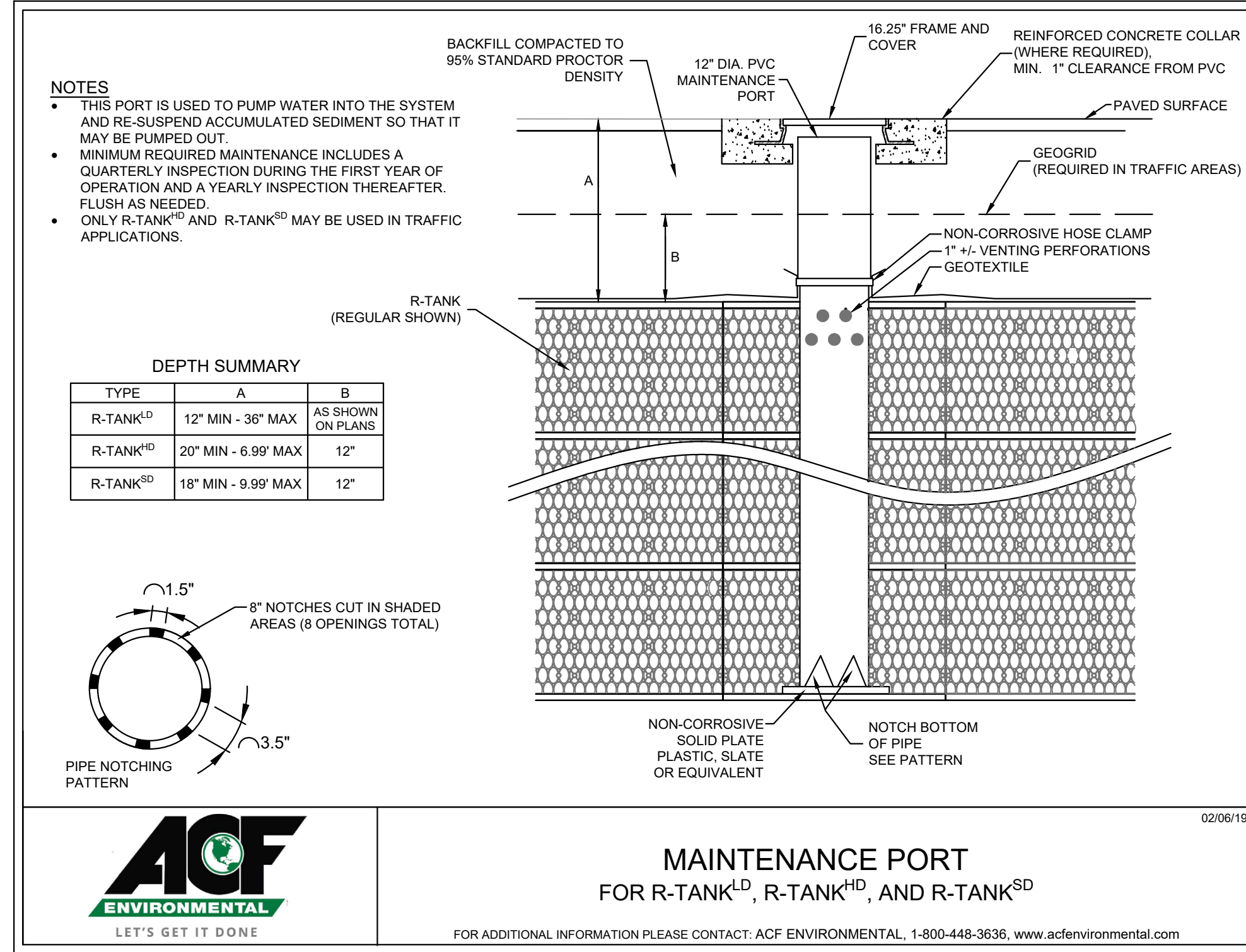
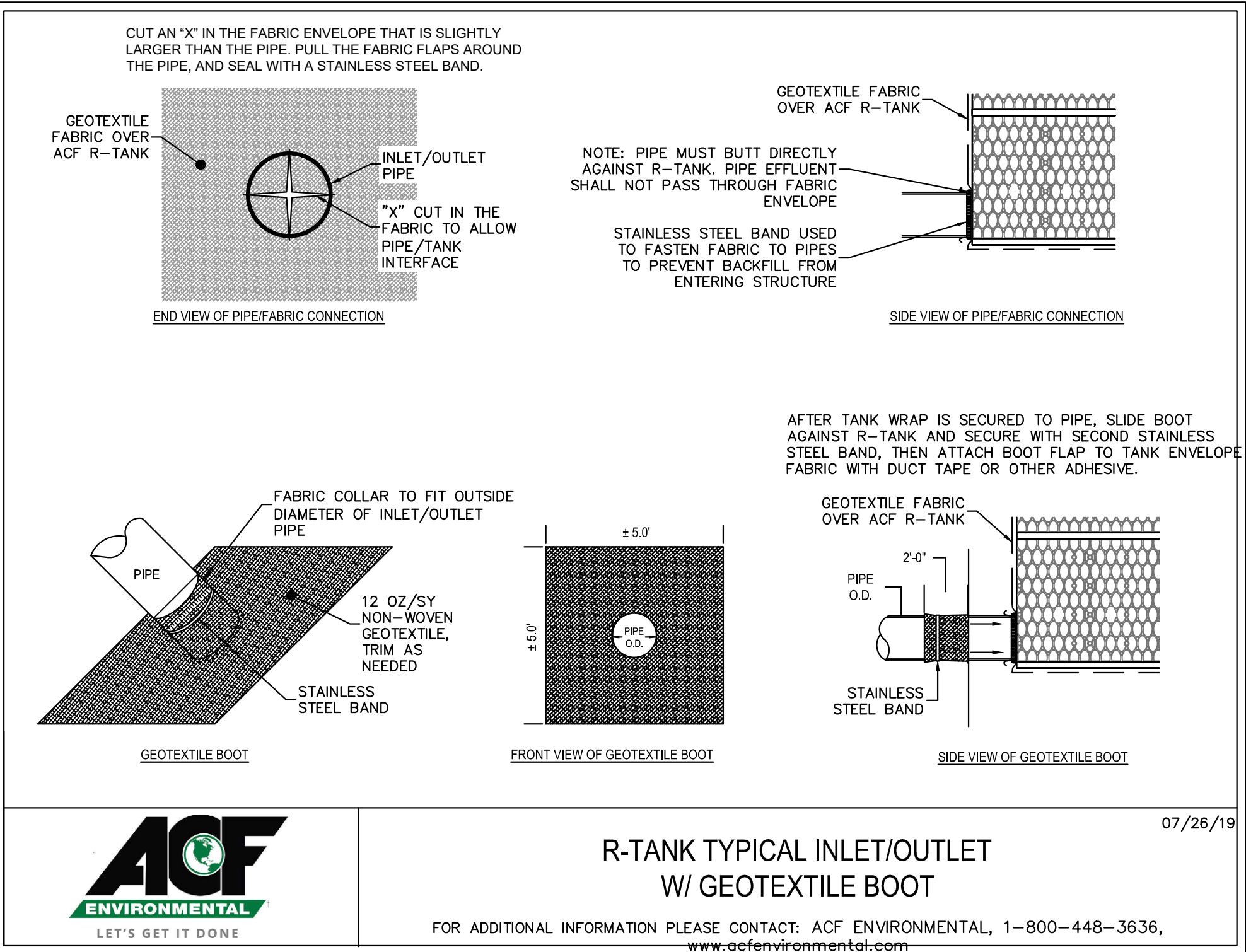
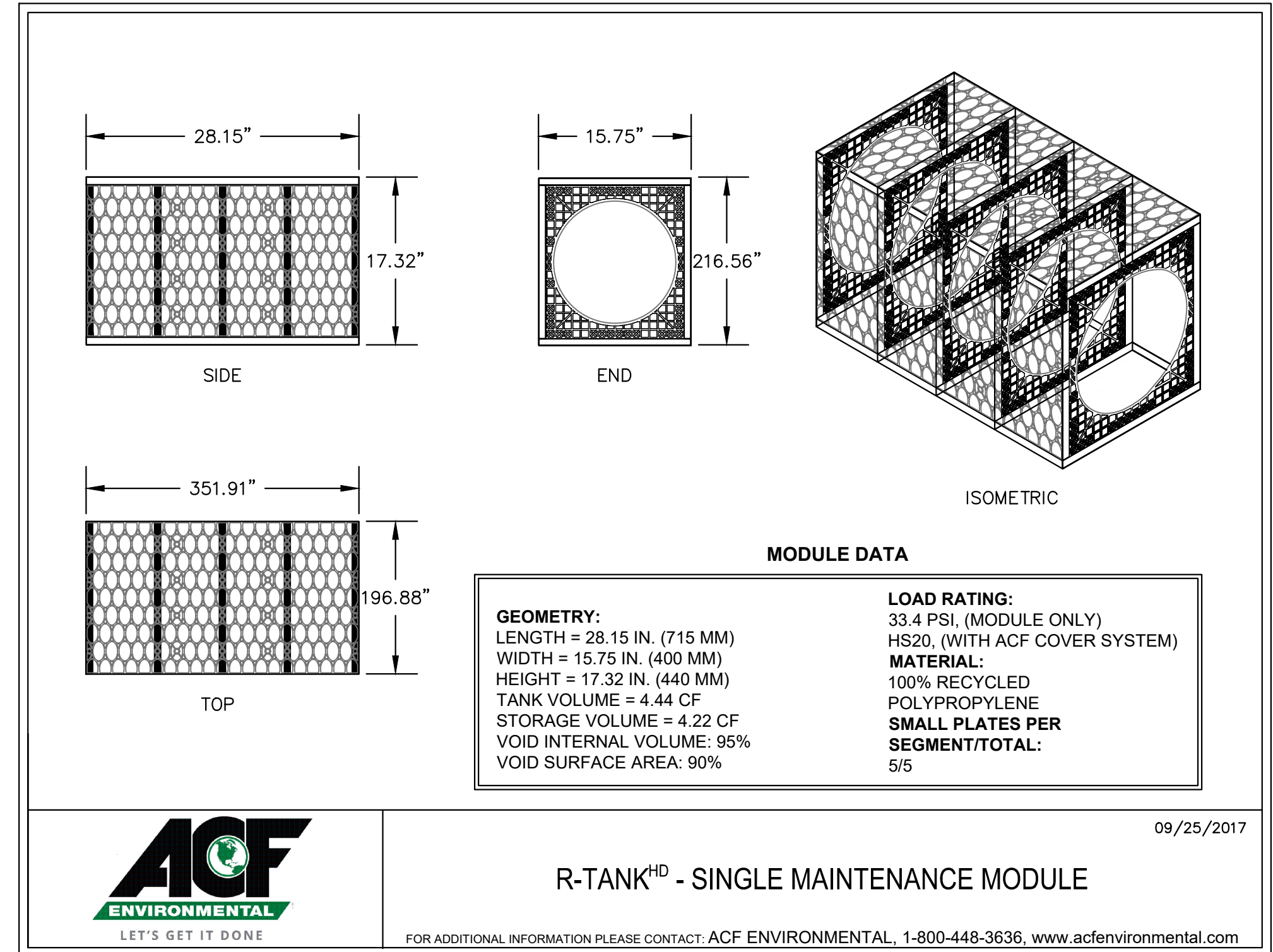
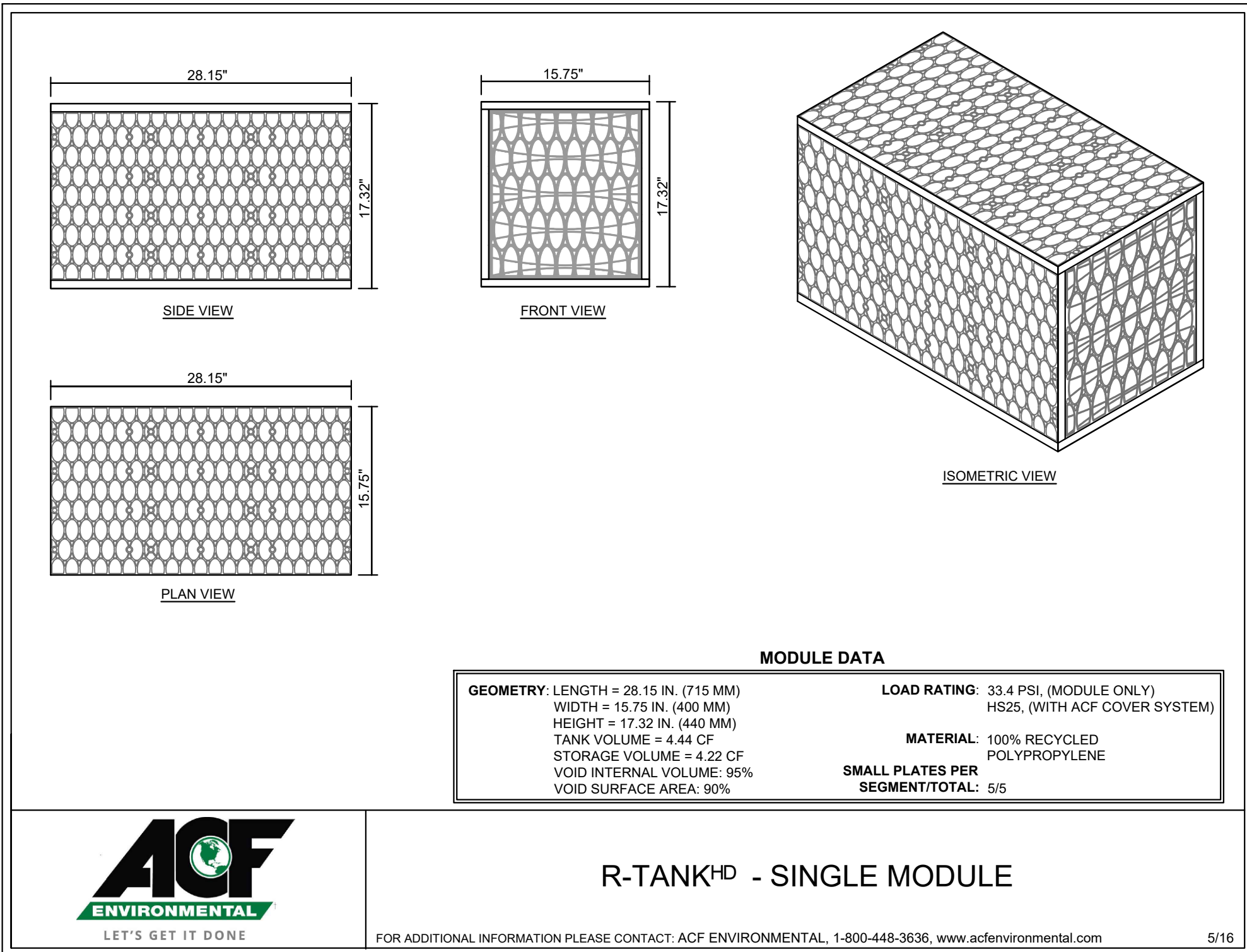
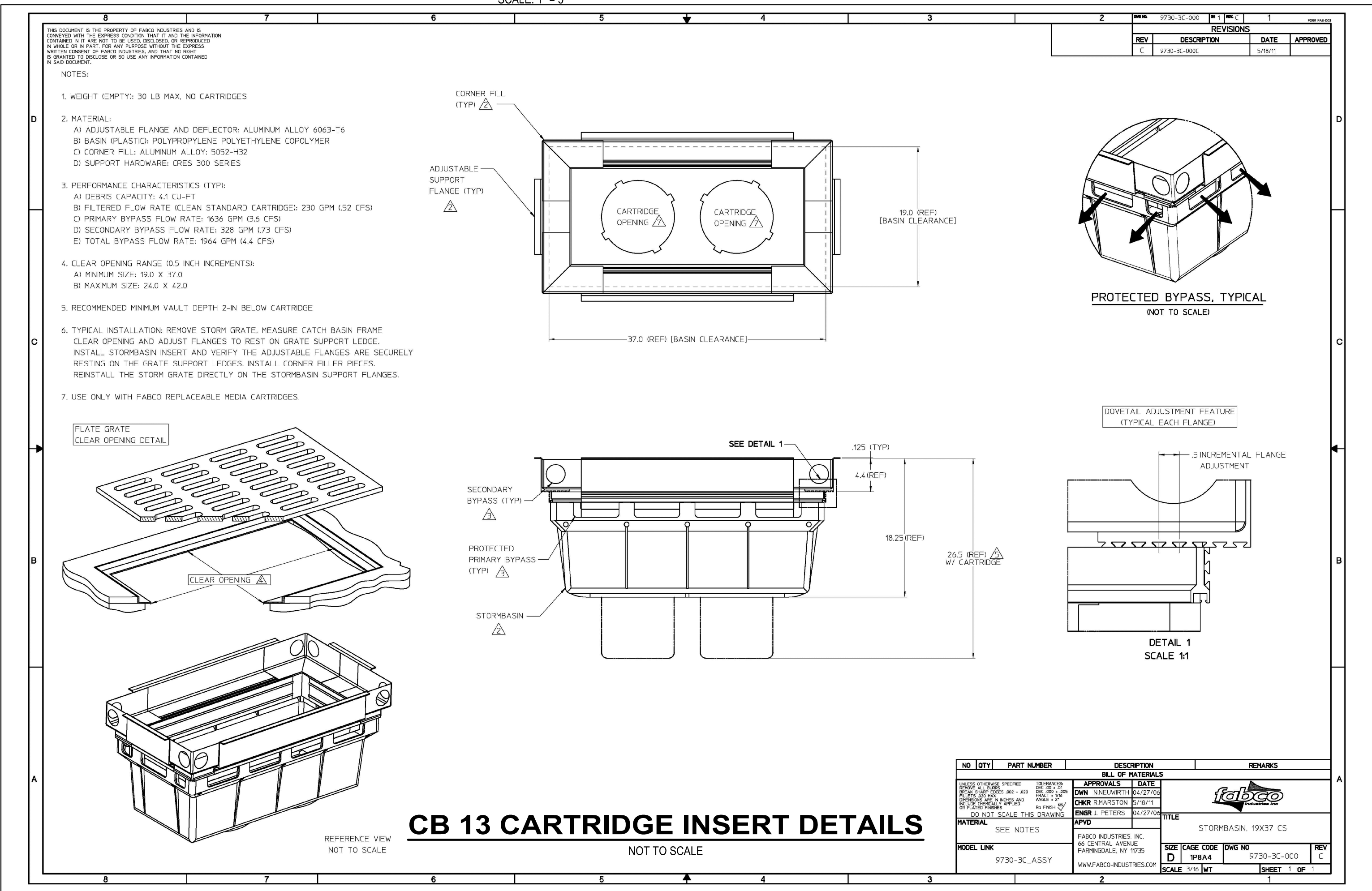
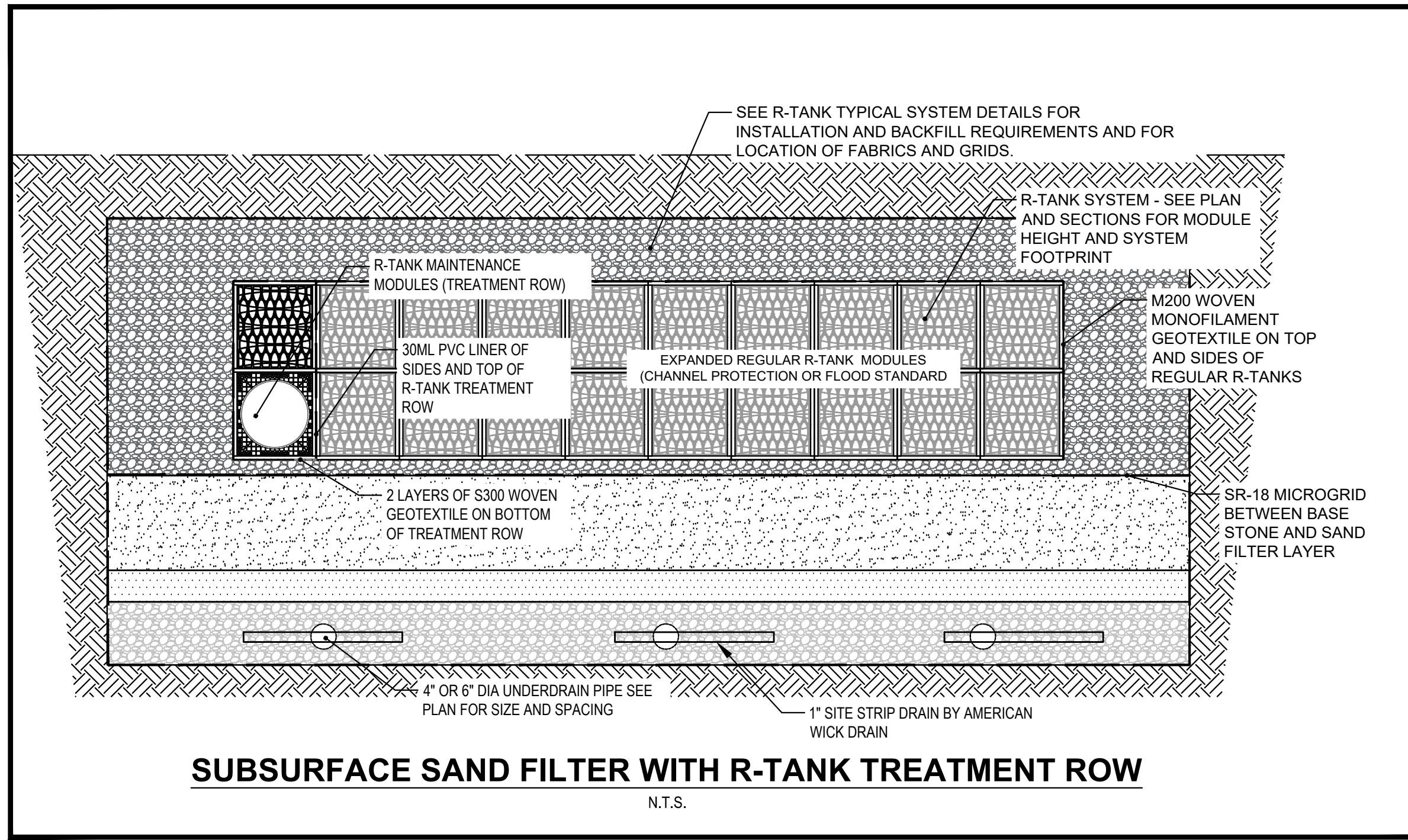
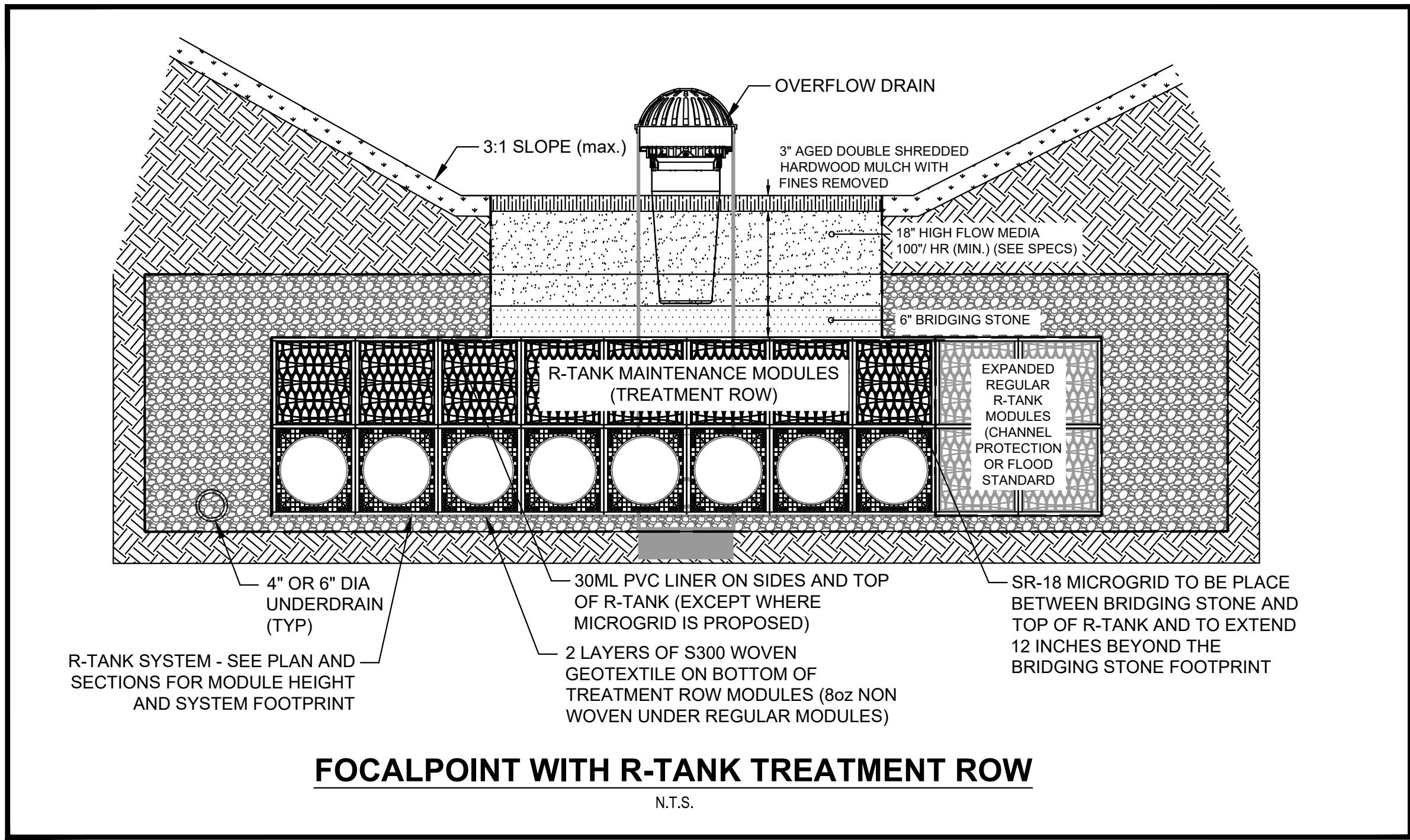
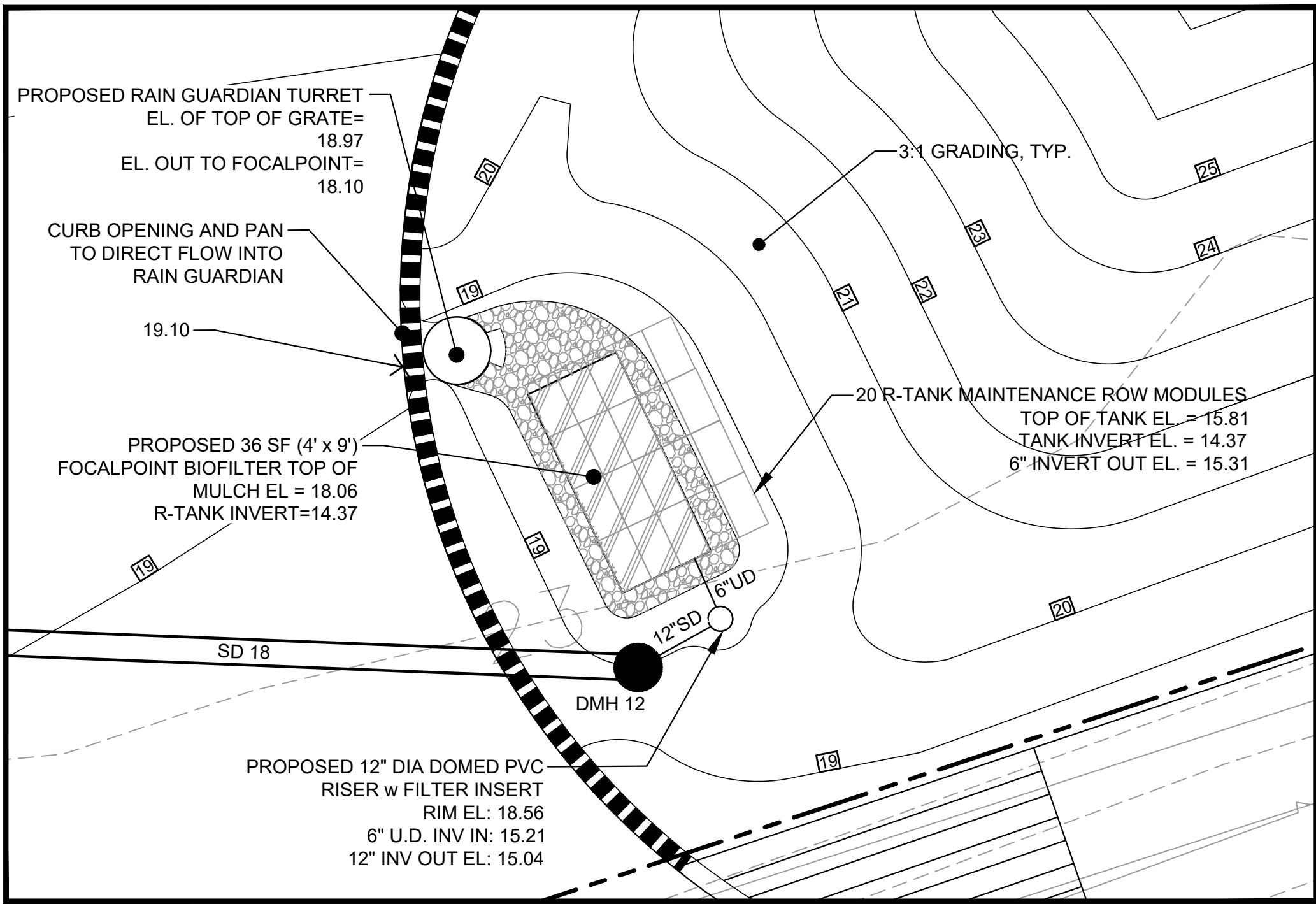
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Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-9.2
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STATE OF MAINE
STEPHEN R. BUSHEY, P.E.
REGISTERED PROFESSIONAL ENGINEER
1672

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Drawing Name:	STORMWATER MANAGEMENT DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.
C-9.3

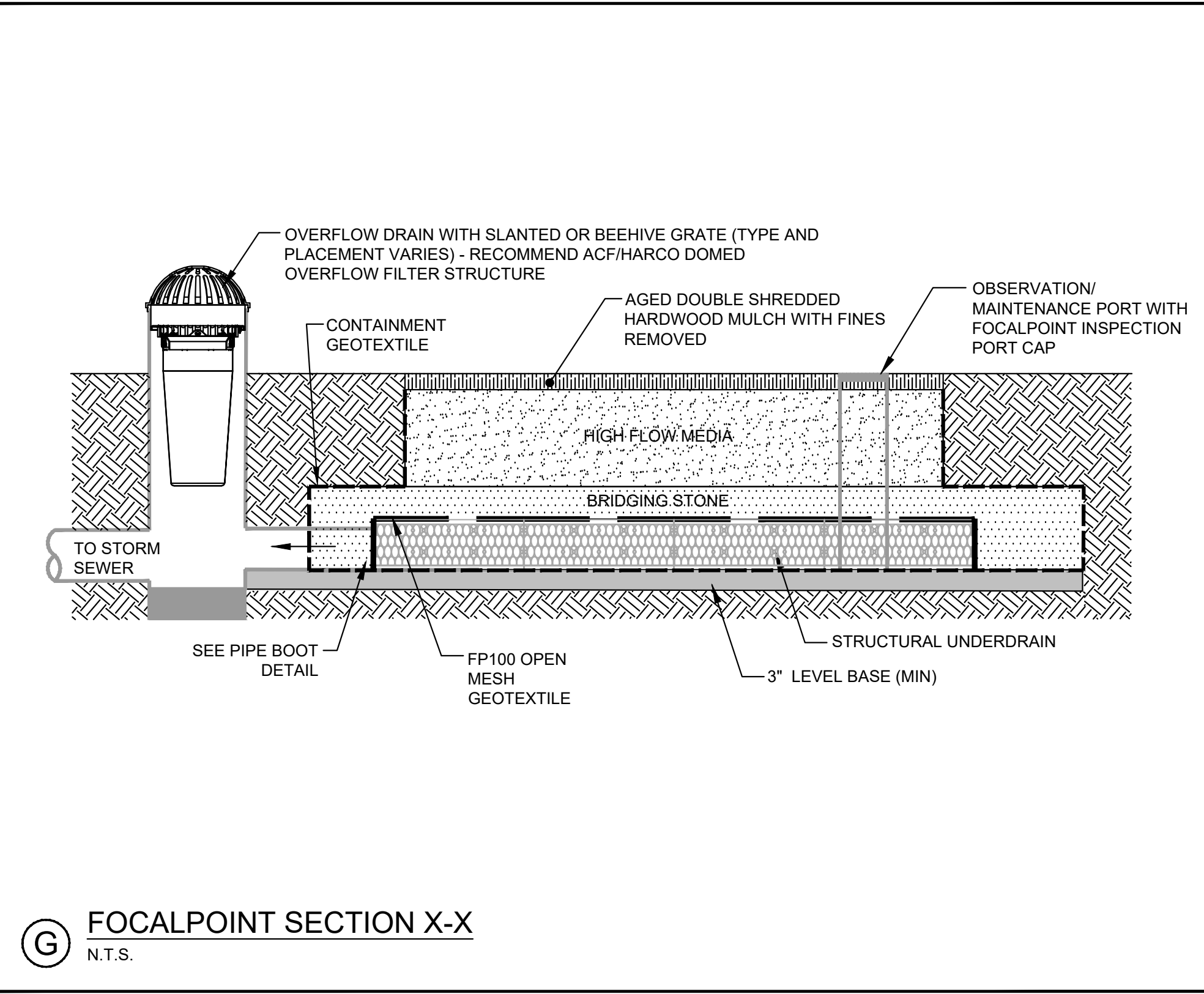
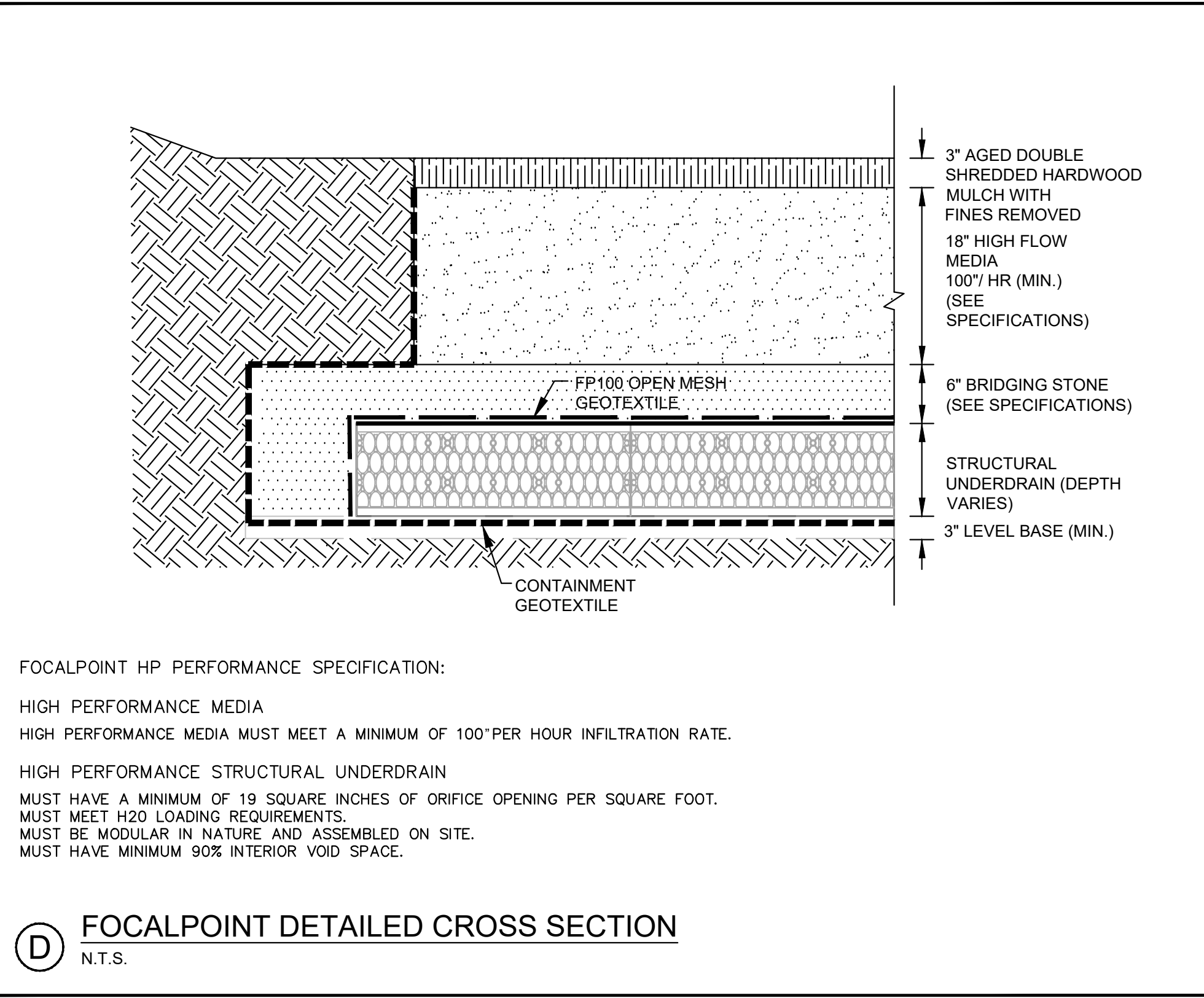
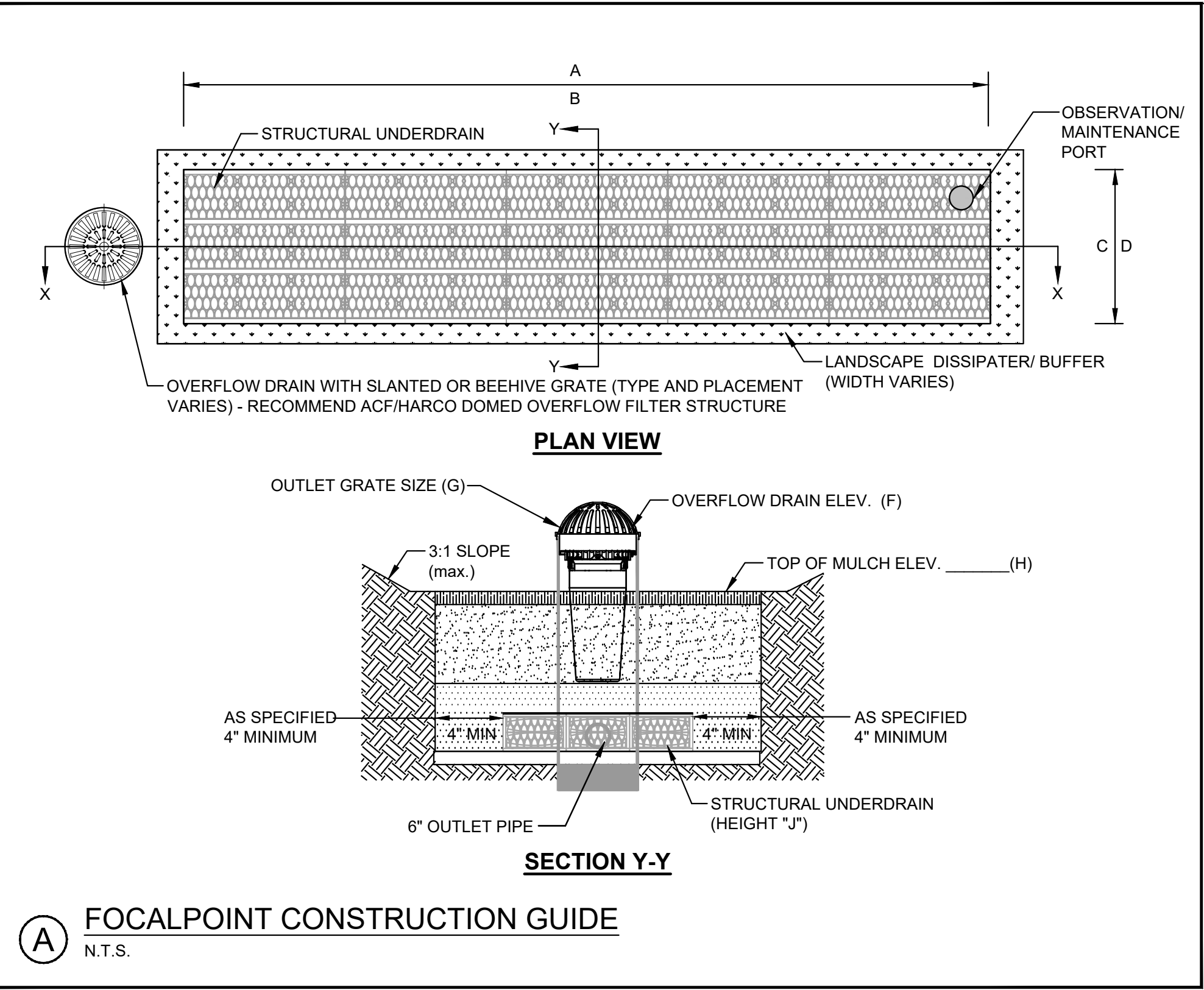
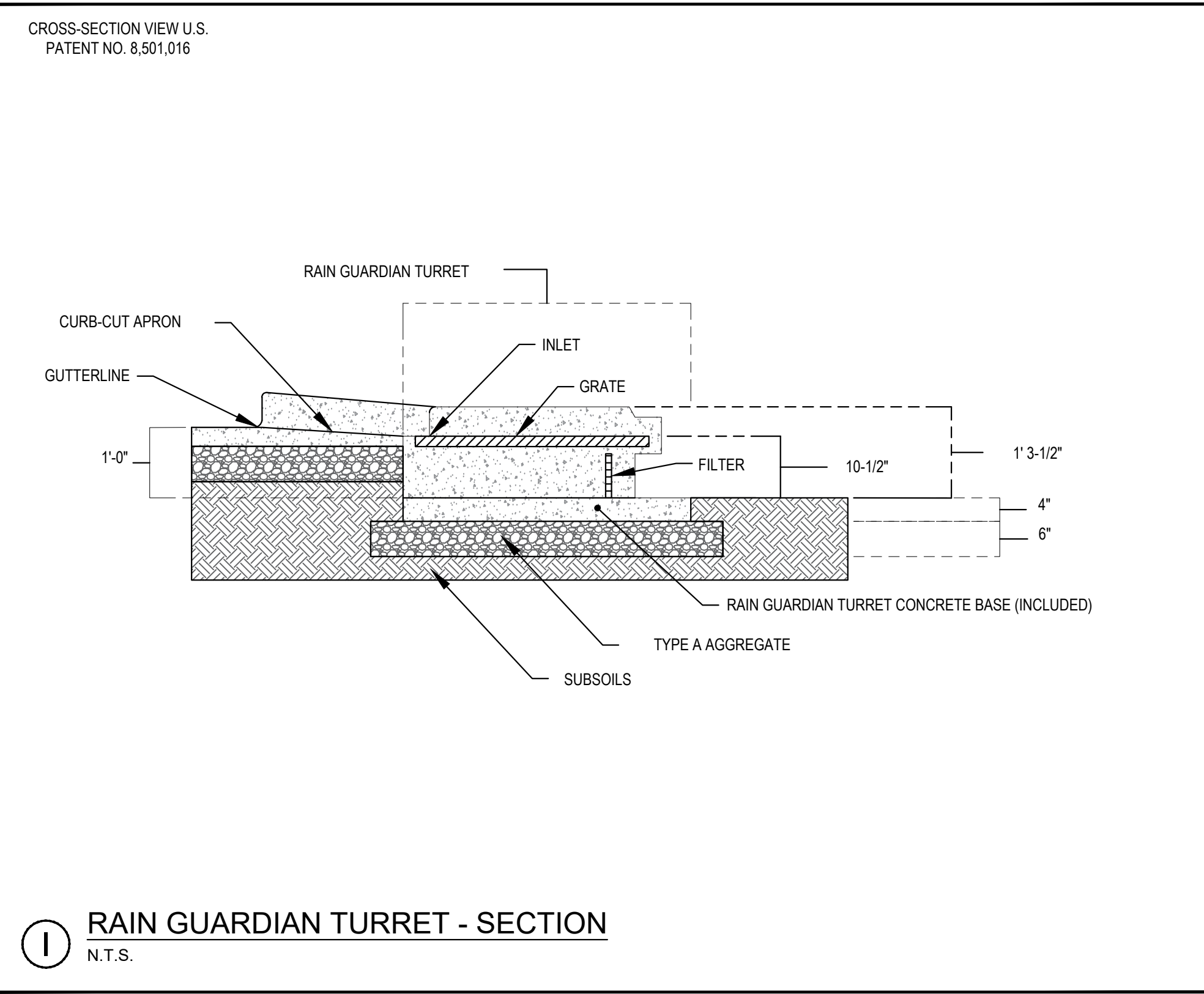
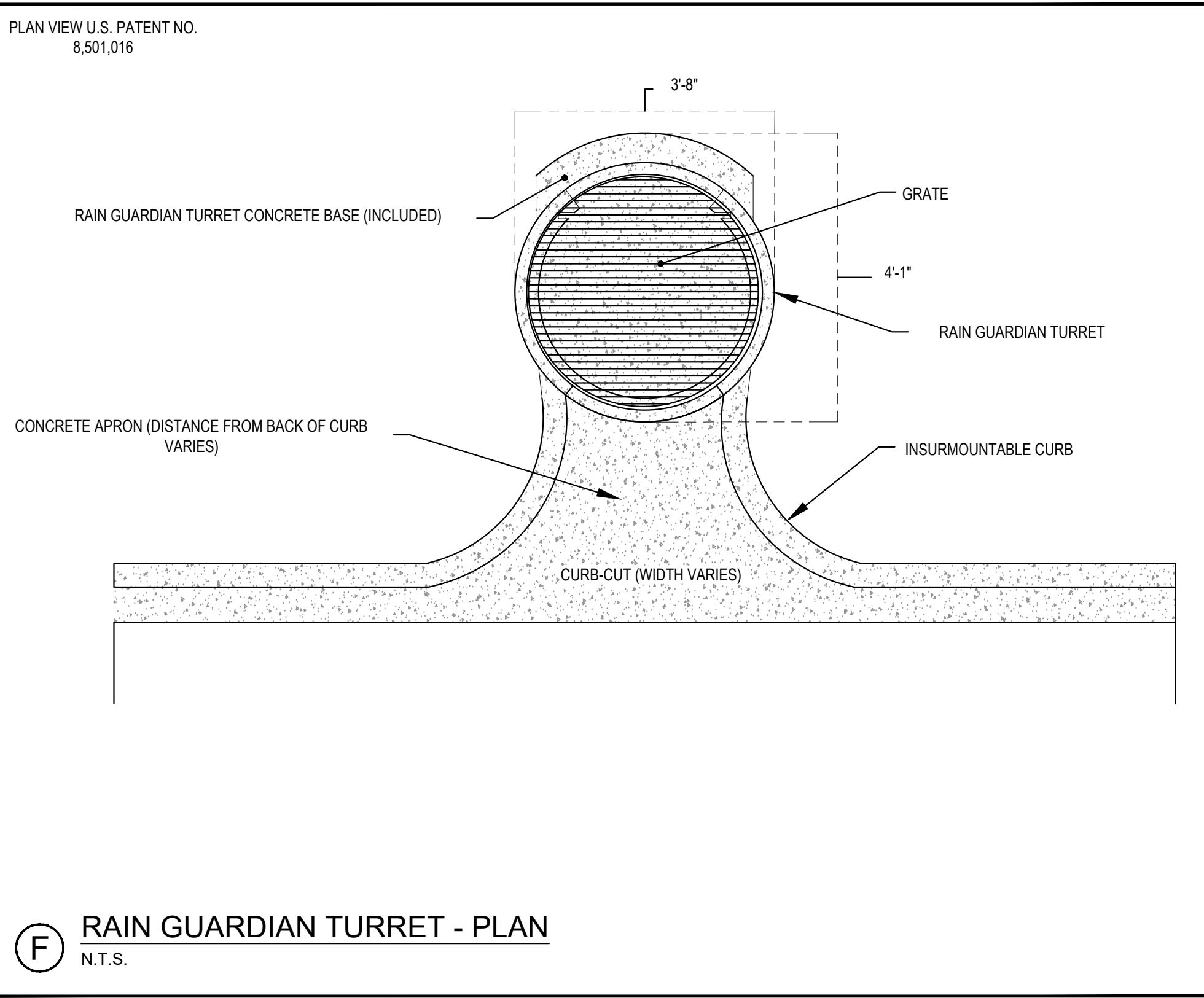
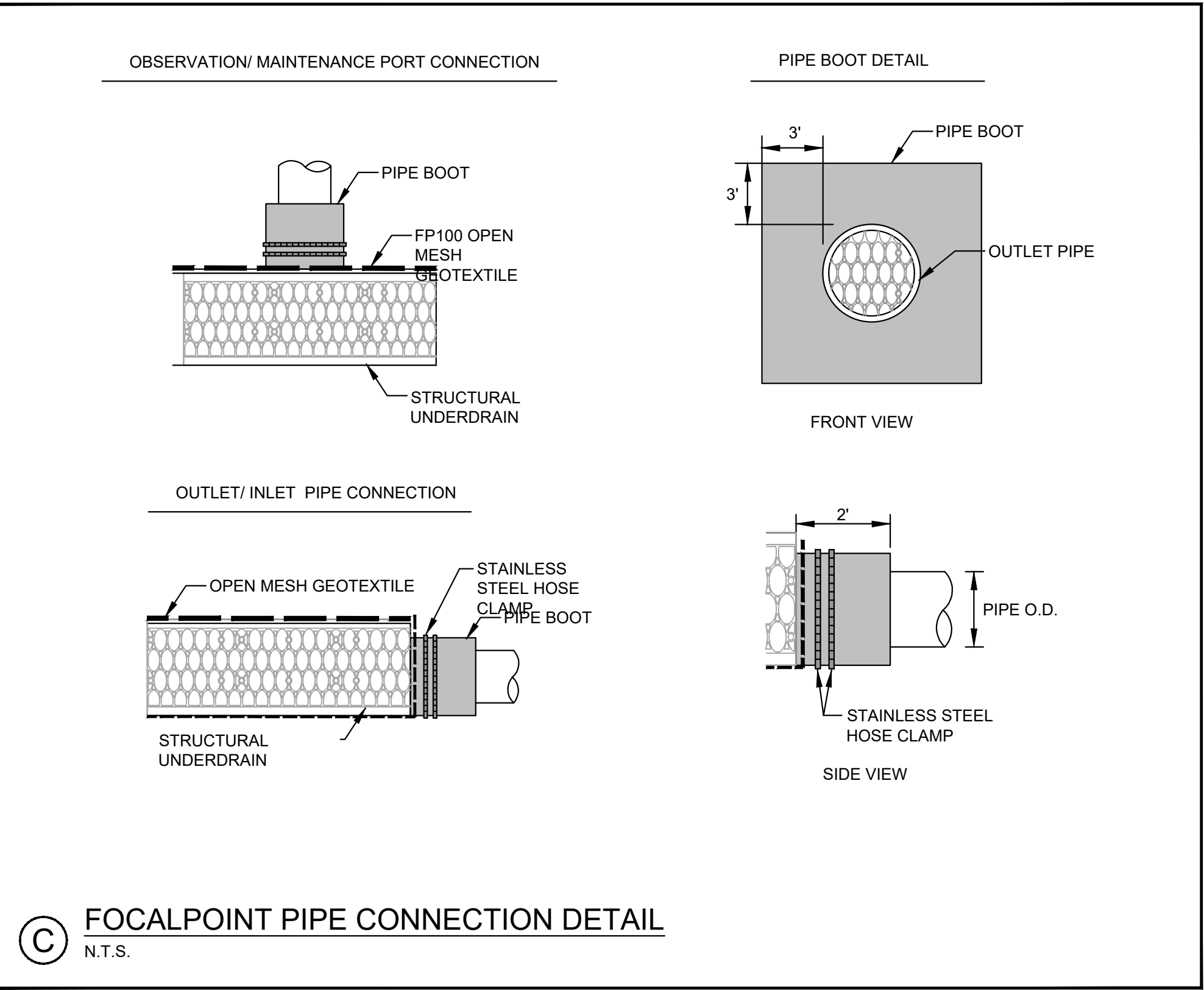
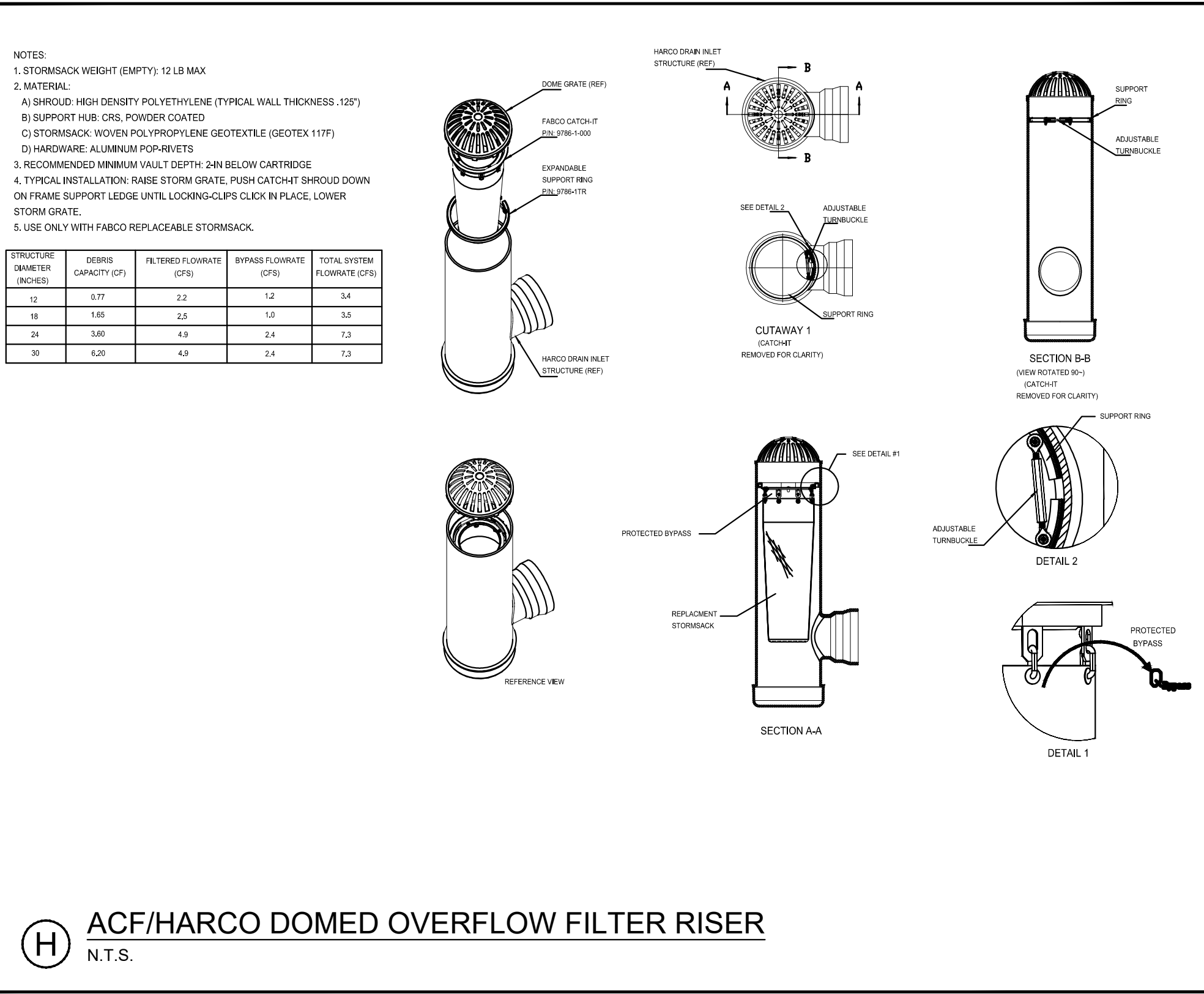
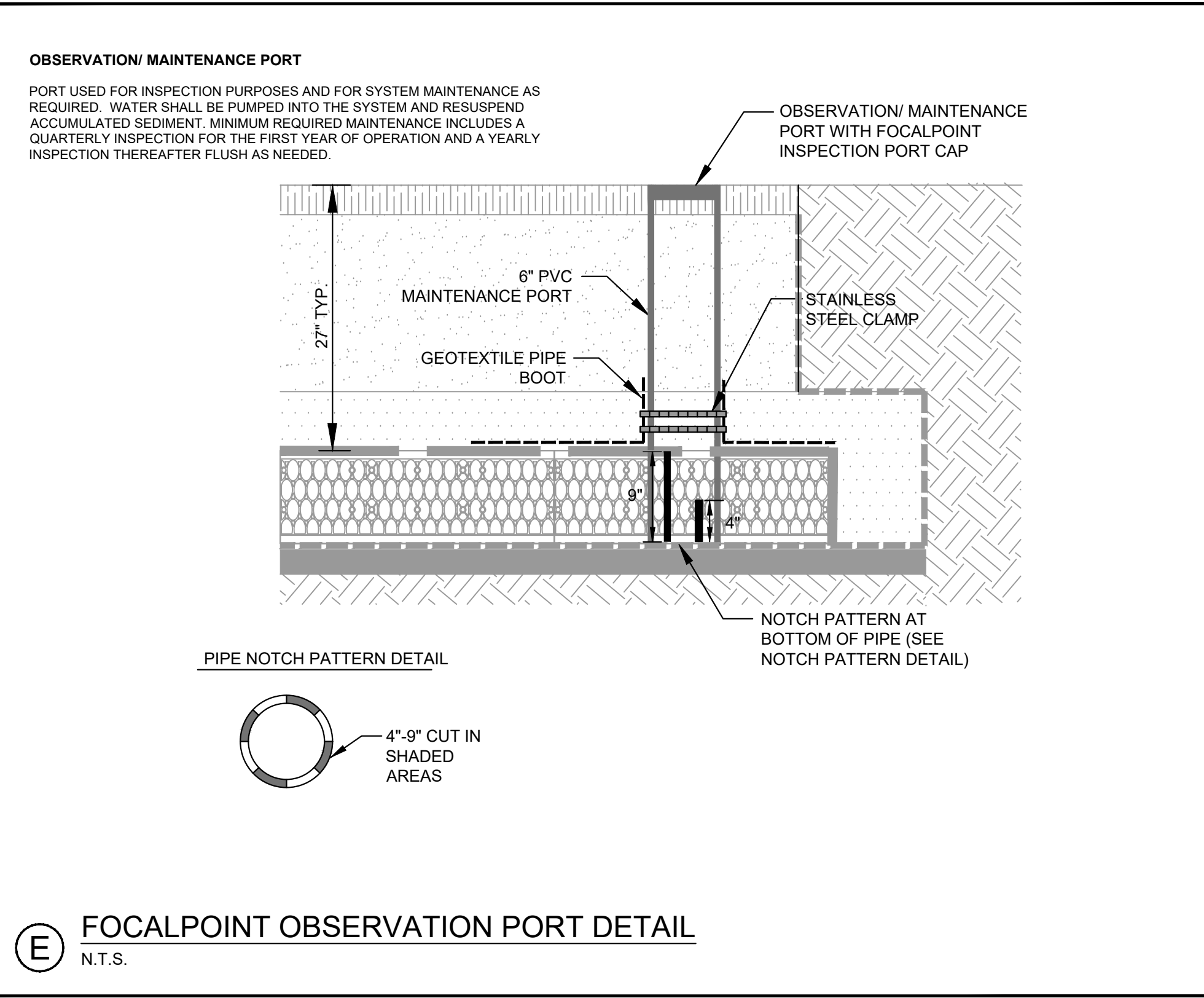


Diagram B: FOCALPOINT KEY DIMENSIONAL DATA. N.T.S.

FOCALPOINT KEY DIMENSIONAL DATA		
FOCALPOINT ID		FP-1
A	FOCALPOINT LENGTH	9.0'
B	# UNDERDRAIN LONG	1
C	FOCALPOINT WIDTH	4.0'
D	# UNDERDRAIN WIDE	1
E	WATER QUALITY VOLUME	N / A
F	OVERFLOW ELEVATION	18.56
G	OUTLET GRATE SIZE	12"
H	TOP OF MULCH	18.06
J	UNDERDRAIN HEIGHT	SINGLE



NOTE: ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.

STATE OF MAINE
STEPHEN R. BUSHEY, P.E.
LICENSED PROFESSIONAL ENGINEER
LIC. #7428

U:\3572_VA Clinic West Commercial St-Portland, ME\Z - CAD\W\3572-SWM PLAN.dwg 3/25/2020 3:47 PM

Rev.	Date	Revision
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-SWM PLAN.dwg		
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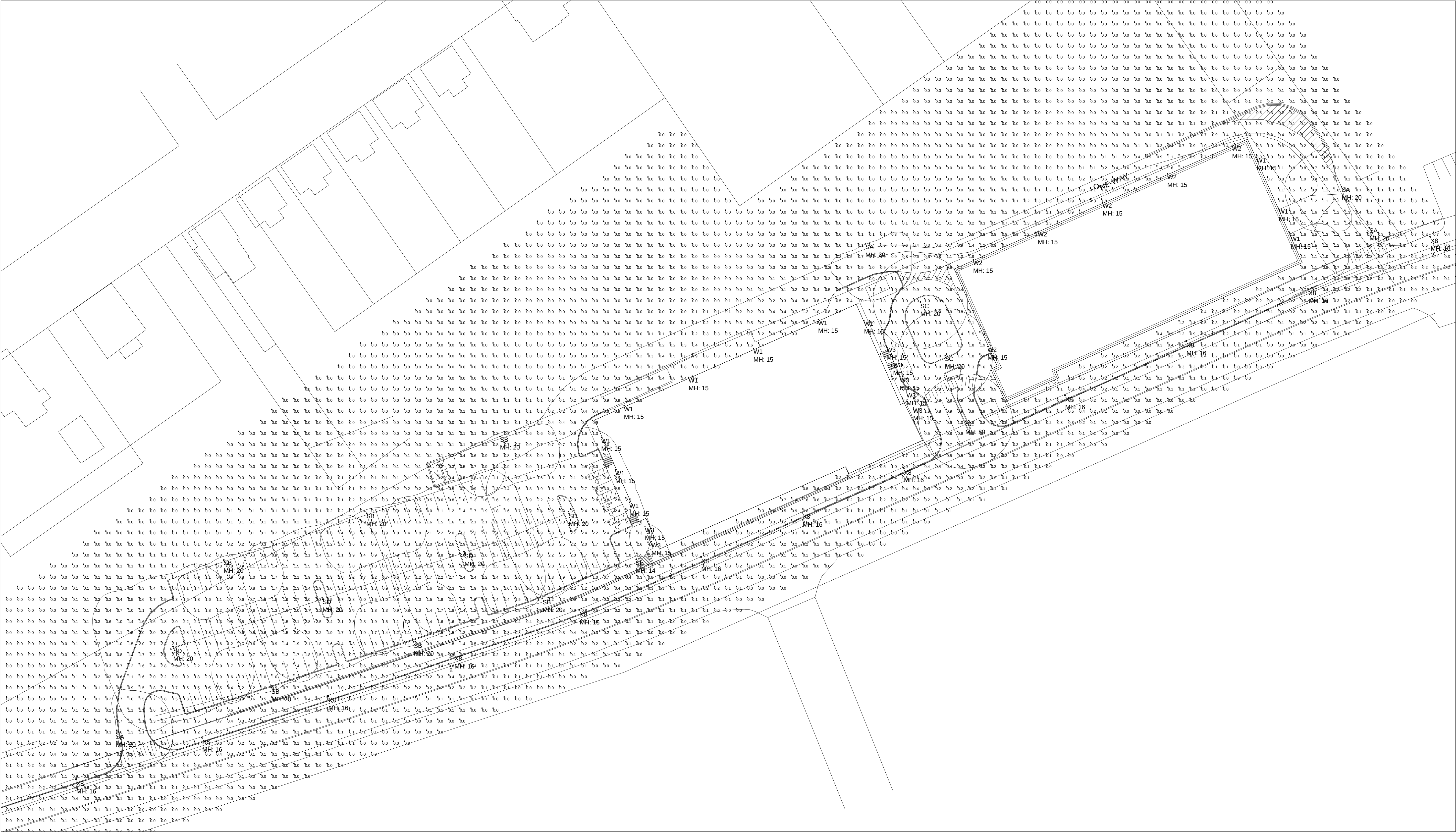
Drawing Name:	STORMWATER MANAGEMENT DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.
C-9.4

Calculation Summary					
Label	Avg	Max	Min	Avg/Min	Max/Min
SITE	0.40	4.2	0.0	N.A.	N.A.
WEST PARKING	1.60	3.4	0.5	3.2	6.8

Luminaire Schedule (note fixture catalogue numbers are not complete)					
Type	Qty	Lum. Lumens	LLF	Lum. Watts	Description
SA	4	3428	0.630	38	ALT1-28L-40-3K9-4-BC prorated for 90cri
SB	6	4585	0.630	38	ALT1-28L-40-3K9-4W prorated for 90cri
SC	3	7144	0.630	60	ALT1-28L-60-3K9-5W prorated for 90cri
SD	4	16435	0.630	156	TWIN ALT1-54L-155-3K9-4W prorated for 90cri
SE	1	1674	0.630	22	ALT1-28L-20-3k9-4W-BC prorated for 90cri
W1	11	3289	0.630	29	WDS-D-24L-30-3K9-4W-UNV-WH prorated for 90cri
W2	6	3340	0.630	29	WDS-D-24L-30-3K9-3 prorated for 90cri
W3	7	1788	0.700	24	BLSD5-24C3-30KH-90-S-WH prorated for 90cri
X8	12	4074	0.780	52.6	GELB Hallbrook estimated distribution

- NOTES:
- 1) EXACT MOUNTING DETAILS TO BE DETERMINED AT JOBSITE BY OTHERS.
 - 2) CALCULATIONS MAY or MAY NOT SHOW THE EFFECT OF SHADOWING CAUSED BY BUILDINGS AND OBJECTS WITHIN THE CALCULATED SPACE OR IN THE SITE AREA.
 - 3) READINGS SHOWN ARE INITIAL HORIZONTAL FOOTCANDLES ON A FLAT SITE WITHOUT REFLECTIONS OR OBSTRUCTIONS UNLESS OTHERWISE INDICATED.
 - 4) THIS CALCULATION IS BASED ON LIMITED INFORMATION SUPPLIED BY OTHERS TO SWANEY LIGHTING ASSOCIATES AND STANDARD ASSUMPTIONS OF THE SPACE AND/OR SITE.
 - 5) CONFORMANCE TO CODES AND OTHER LOCAL REQUIREMENTS AS DETERMINED BY THE AHJ ARE THE RESPONSIBILITY OF THE OWNER AND/OR THE OWNER'S REPRESENTATIVE.
 - 6) THIS LAYOUT DRAWING MUST BE COORDINATED WITH THE SITE LOCATION FOR CORRECT FIXTURE ORIENTATION.
 - 7) DOCUMENTS PRINTED OR PLOTTED FROM ELECTRONIC FILES MAY APPEAR AT OTHER THAN THE DESIRED OR ASSUMED GRAPHIC SCALES. IT IS THE RESPONSIBILITY OF THE RECIPIENT TO VERIFY THAT THE PRINTED OR PLOTTED-TO-SCALE DRAWING IS PRINTED TO SCALE.



PLAN VIEW

TITLE

VETERANS AFFAIRS
PORTLAND, ME
SITE LIGHTING LAYOUT

GENERATED FOR:

CORRILL PALMER
SMITH GROUP

SCALE

NOT TO SCALE

Page 1 of 1

Date:11/15/2019

GENERATED BY SWANEY LIGHTING, SCARBOROUGH ME - 207-883-7100 - swaneyLighting.com

site 11-15-19_A01

NOTICE: THIS DRAWING IS THE EXCLUSIVE PROPERTY OF SWANEY LIGHTING ASSOCIATES. INFORMATION CONCERNING THE OPERATION OF UNITS INDICATED, THIS DRAWING IS TO BE CONFIDENTIAL. THIS DRAWING IS TO BE USED FOR NO PURPOSE OTHER THAN AS DETAILED HEREIN. IT IS NOT TO BE REPRODUCED, COPIED, OR OTHERWISE DISCLOSED OR COPIED, EXCEPT AS EXPRESSLY AUTHORIZED BY SWANEY LIGHTING ASSOCIATES.

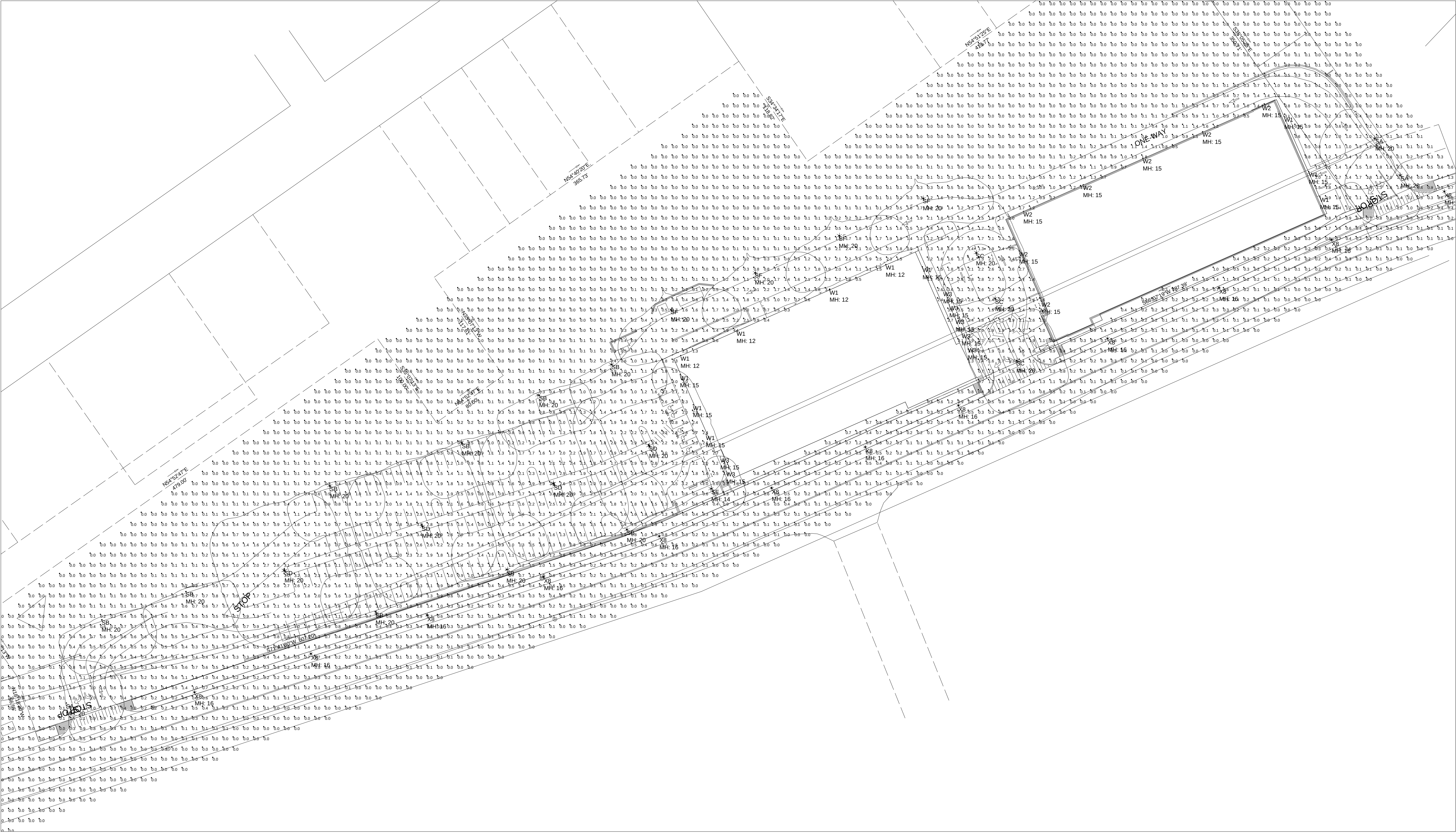
NOTICE: THE INTENT OF THIS LIGHTING LAYOUT IS TO SUGGEST THE BEST UTILIZATION OF THE FIXTURES SHOWN. IT IS NOT THE RESPONSIBILITY OF THE MANUFACTURER TO VARY THE PERFORMANCE SHOWN IN THESE FILES. IT IS NOT THE RESPONSIBILITY OF THE MANUFACTURER. IT'S USE FOR ANY OTHER PURPOSE IS NOT AUTHORIZED BY SWANEY LIGHTING ASSOCIATES.

C-6.3

Calculation Summary					
Label	Avg	Max	Min	Avg/Min	Max/Min
WEST PARKING	1.56	3.4	0.5	3.1	6.8
SITE	0.50	4.1	0.0	N.A.	N.A.

Luminaire Schedule (note fixture catalogue numbers are not complete)					
Type	Qty	Lum. Lumens	LLF	Lum. Watts	Description
SA	3	5171	0.630	60	ALT1-28L-60-3K9-4-BC prorated for 90 cri
SB	9	4585	0.630	38	ALT1-28L-40-3k9-4W prorated for 90cri
SC	3	11770	0.630	94	ALT1-54L-95-3k9-5QM prorated for 90cri
SD	4	16435	0.630	156	TWIN ALT1-54L-155-3k9-4W prorated for 90cri
SE	1	1674	0.630	22	ALT1-28L-20-3k9-4W-BC prorated for 90cri
SF	4	9183	0.630	86	ALT1-28L-85-3k9-3 prorated for 90cri
W1	11	3289	0.630	29	WDS-D-24L-30-3K9-4W-UNV-WH prorated for 90cri
W2	7	3340	0.630	29	WDS-D-24L-30-3K9-3 prorated for 90cri
W3	7	1788	0.700	24	BLSD5-24C3-30KH-90-S-WH prorated for 90cri
X8	12	4074	0.780	52.6	City pole - Hallbrook estimated distribution

- NOTES:
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 - 2) CALCULATIONS MAY or MAY NOT SHOW THE EFFECT OF SHADOWING CAUSED BY BUILDINGS AND OBJECTS WITHIN THE CALCULATED SPACE OR IN THE SITE AREA.
 - 3) READINGS SHOWN ARE INITIAL HORIZONTAL FOOTCANDLES ON A FLAT SITE WITHOUT REFLECTIONS OR OBSTRUCTIONS UNLESS OTHERWISE INDICATED.
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 - 7) DOCUMENTS PRINTED OR PLOTTED FROM ELECTRONIC FILES MAY APPEAR AT OTHER THAN THE DESIRED OR ASSUMED GRAPHIC SCALES. IT IS THE RESPONSIBILITY OF THE RECIPIENT TO VERIFY THAT THE PRINTED OR PLOTTED-TO-SCALE DRAWING IS PRINTED TO SCALE.



PLAN VIEW

VETERANS AFFAIRS
PORTLAND, ME
SITE LIGHTING LAYOUT

GENERATED FOR:
CORRILL PALMER
SMITH GROUP

SCALE: NOT TO SCALE

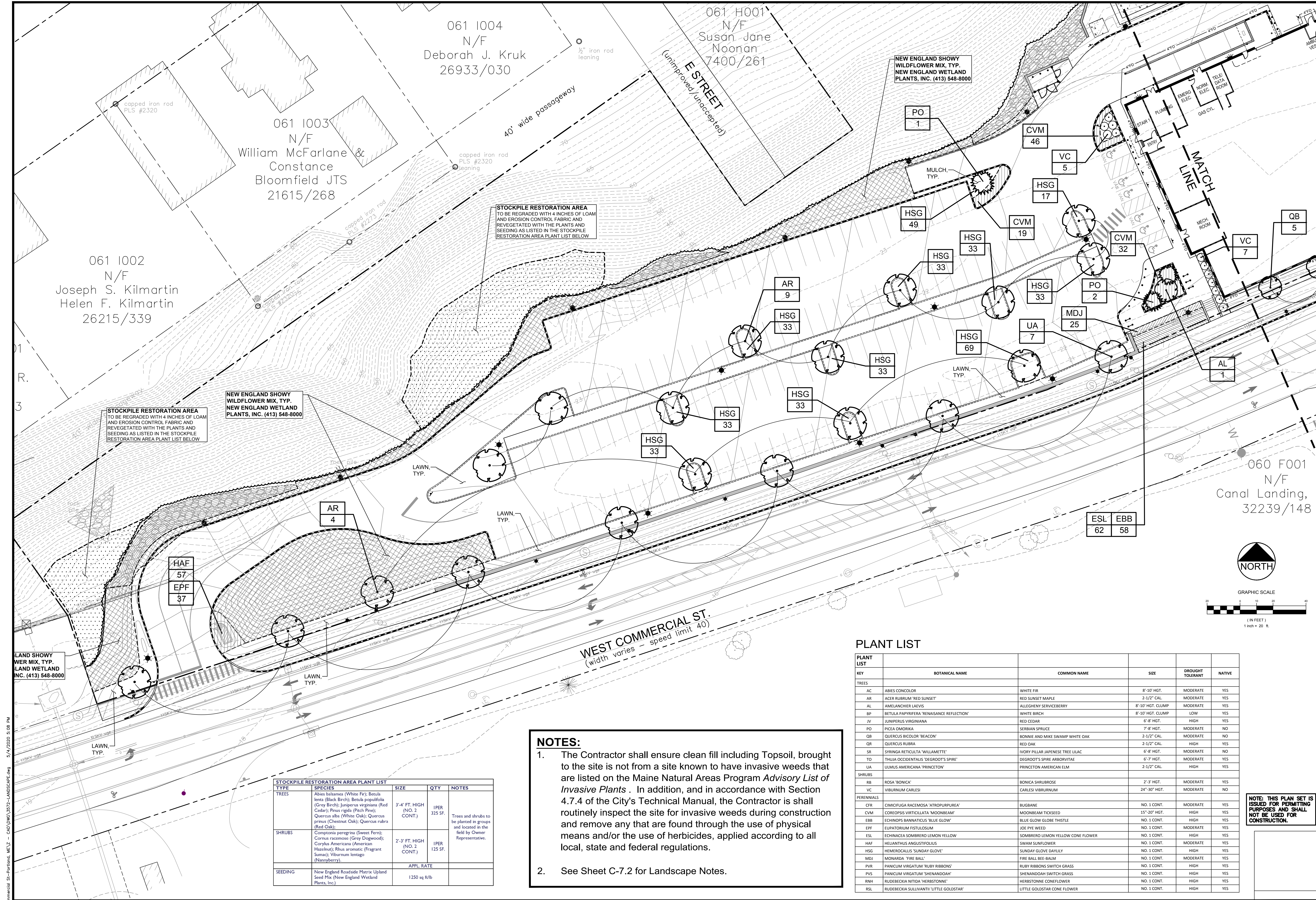
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site 3-12-20 .AGI

DATE: 3/12/2020

Page 1 of 1

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NOTES:

- The Contractor shall ensure clean fill including Topsoil, brought to the site is not from a site known to have invasive weeds that are listed on the Maine Natural Areas Program *Advisory List of Invasive Plants*. In addition, and in accordance with Section 4.7.4 of the City's Technical Manual, the Contractor is shall routinely inspect the site for invasive weeds during construction and remove any that are found through the use of physical means and/or the use of herbicides, applied according to all local, state and federal regulations.
- See Sheet C-7.2 for Landscape Notes.

PLANT LIST

PLANT LIST	BOTANICAL NAME	COMMON NAME	SIZE	DROUGHT TOLERANT	NATIVE
AC	ABIES CONCOLOR	WHITE FIR	8'-10' HGT.	MODERATE	YES
AR	ACER RUBRUM 'RED SUNSET'	RED SUNSET MAPLE	2'-1/2" CAL.	MODERATE	YES
AL	AMELANCHIER LAEVIS	ALLEGHENY SERVICEBERRY	8'-10' HGT. CLUMP	MODERATE	YES
BP	BETULA PAPPYRIFERA 'RENAISSANCE REFLECTION'	WHITE BIRCH	8'-10' HGT. CLUMP	LOW	YES
JV	JUNIPERUS VIRGINIANA	RED CEDAR	6'-8' HGT.	HIGH	YES
PO	PICEA OMORICA	SERBIAN SPRUCE	7'-8' HGT.	MODERATE	NO
QB	QUERCUS BICOLOR 'BEACON'	BONNIE AND MIKE SWAMP WHITE OAK	2'-1/2" CAL.	MODERATE	NO
QR	QUERCUS RUBRA	RED OAK	2'-1/2" CAL.	HIGH	YES
SR	SYRINGA RETICULATA 'WILLAMETTE'	IVORY PILLAR JAPANESE TREE LILAC	6'-8' HGT.	MODERATE	NO
TO	THUJA OCCIDENTALIS 'DEGROOT'S SPIRE'	DEGROOT'S SPIRE ARBORVITAE	6'-7' HGT.	MODERATE	YES
UA	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	2'-1/2" CAL.	HIGH	YES
SHRUBS					
RB	ROSA 'BONICA'	BONICA SHRUBROSE	2'-3' HGT.	MODERATE	YES
VC	VIBURNUM CARLESII	CARLESII VIBURNUM	24"-30" HGT.	MODERATE	NO
PERENNIALS					
CFR	CIMICIFUGA RACEMOSA 'ATROPURPUREA'	BUGBANE	NO. 1 CONT.	MODERATE	YES
CVM	COREOPSIS VIRTICILLATA 'MOONBEAM'	MOONBEAM TICKSEED	15"-20" HGT.	HIGH	YES
EBB	ECHINOPS BANNATICUS 'BLUE GLOW'	BLUE GLOW GLOBE THISTLE	NO. 1 CONT.	HIGH	YES
EPF	EUPATORIUM FISTULOSUM	JOE PYE WEED	NO. 1 CONT.	MODERATE	YES
ESL	ECHEINACEA SOMBRERO LEMON YELLOW	SOMBRERO LEMON YELLOW CONE FLOWER	NO. 1 CONT.	HIGH	YES
HAF	HELIANTHUS ANGIUSTIFOLIUS	SWAM SUNFLOWER	NO. 1 CONT.	MODERATE	YES
HSG	HEMEROCALLIS 'SUNDAY GLOVE'	SUNDAY GLOVE DAYLILY	NO. 1 CONT.	HIGH	YES
MDJ	MONARDA 'FIRE BALL'	FIRE BALL BEE-BALM	NO. 1 CONT.	MODERATE	YES
PVR	PANICUM VIRGATUM 'RUBY RIBBONS'	RUBY RIBBONS SWITCH GRASS	NO. 1 CONT.	HIGH	YES
PVS	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	NO. 1 CONT.	HIGH	YES
RNH	RUDEBECKIA NITIDA 'HERBSTONNE'	HERBSTONNE CONEFLOWER	NO. 1 CONT.	HIGH	YES
RSL	RUDEBECKIA SULLIVANTII 'LITTLE GOLDSTAR'	LITTLE GOLDSTAR CONE FLOWER	NO. 1 CONT.	HIGH	YES

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.

Rev.

Date

Revision

205.01.20

REVISED AND RESUBMITTED TO CITY

03.25.20

REVISED PER CITY REVIEW AND RESUBMITTED

1

Design: SRB

Draft: CDD

Date: NOV. 2019

Checked: SRB

Scale: AS NOTED

Job No.: 3572

File Name: 3572-LANDSCAPE.dwg

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04.08.20

SRB

RELEASED TO CONTRACTOR - 90% PRICING SET

03.06.20

SRB

LEVEL III SITE PLAN APPLICATION

01.20.20

SRB

TMP APPLICATION

11.22.19

SRB

Issued For

By

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Drawing Name:

LANDSCAPE PLAN - WEST SIDE

Project:

U.S. Department of Veterans Affairs - Community Based Outpatient Clinic
141 West Commercial Street, Portland, Maine

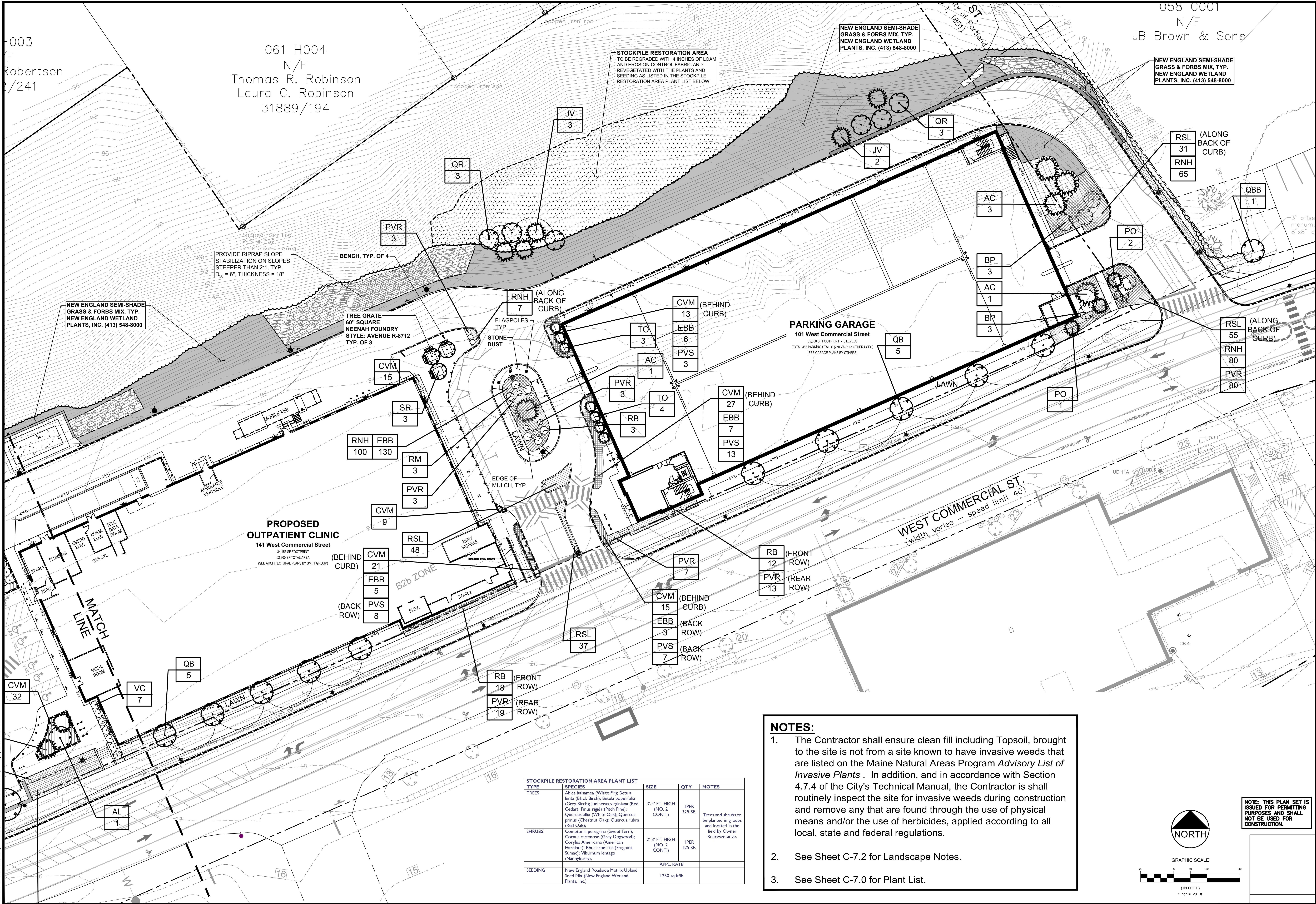
Client:

FDS JBB PORTLAND, LLC
10 Free Street, Portland, Maine 04101

Drawing No.

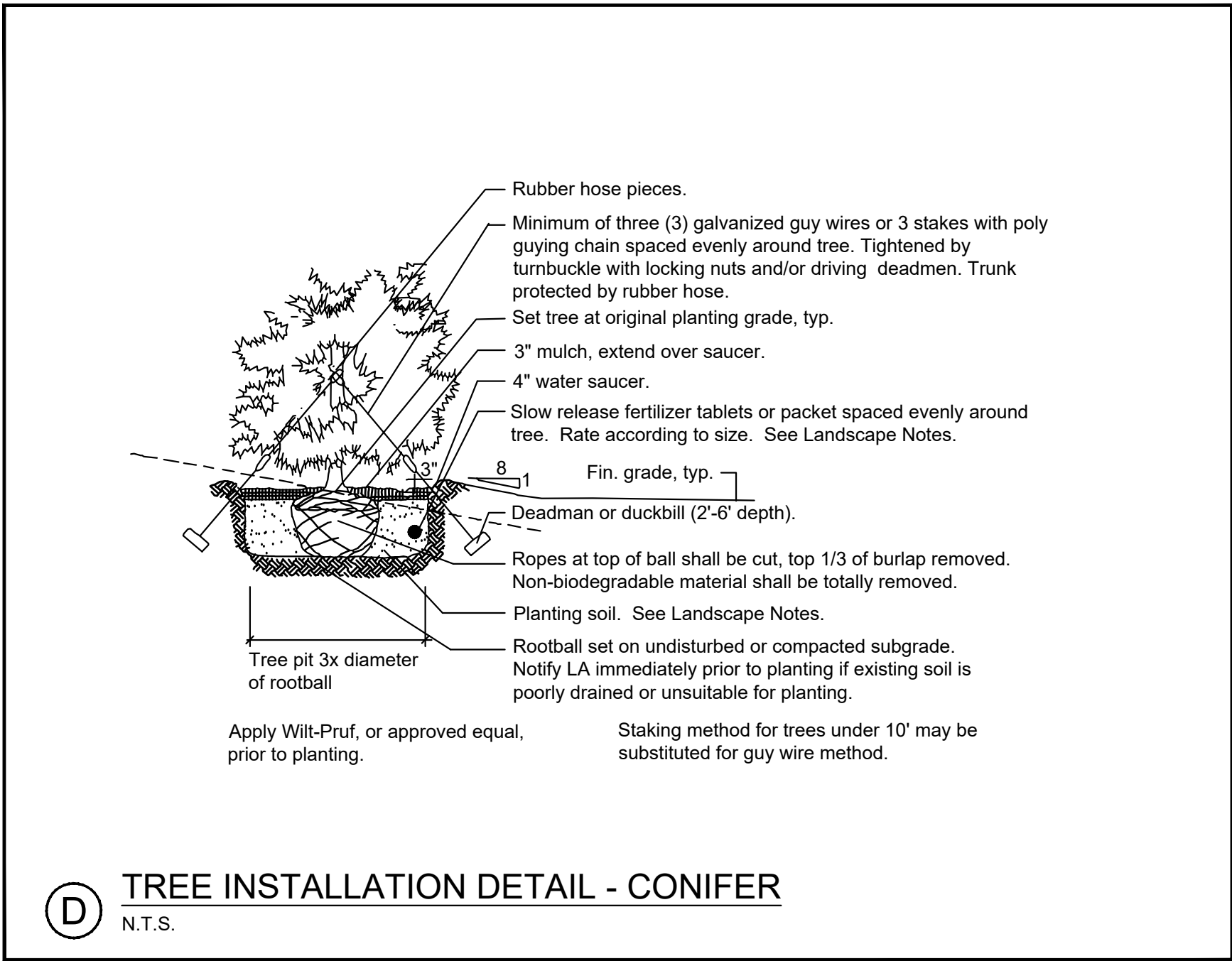
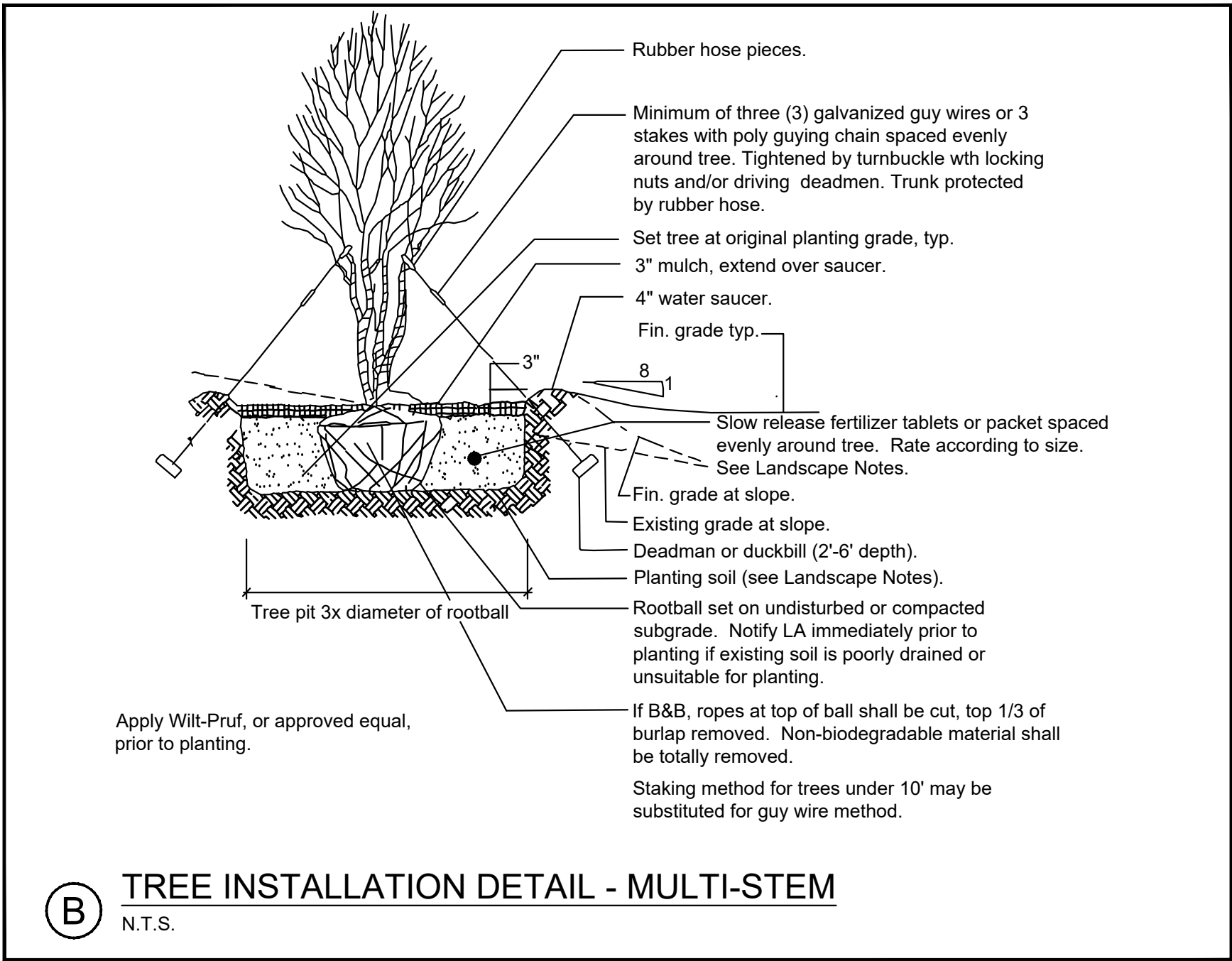
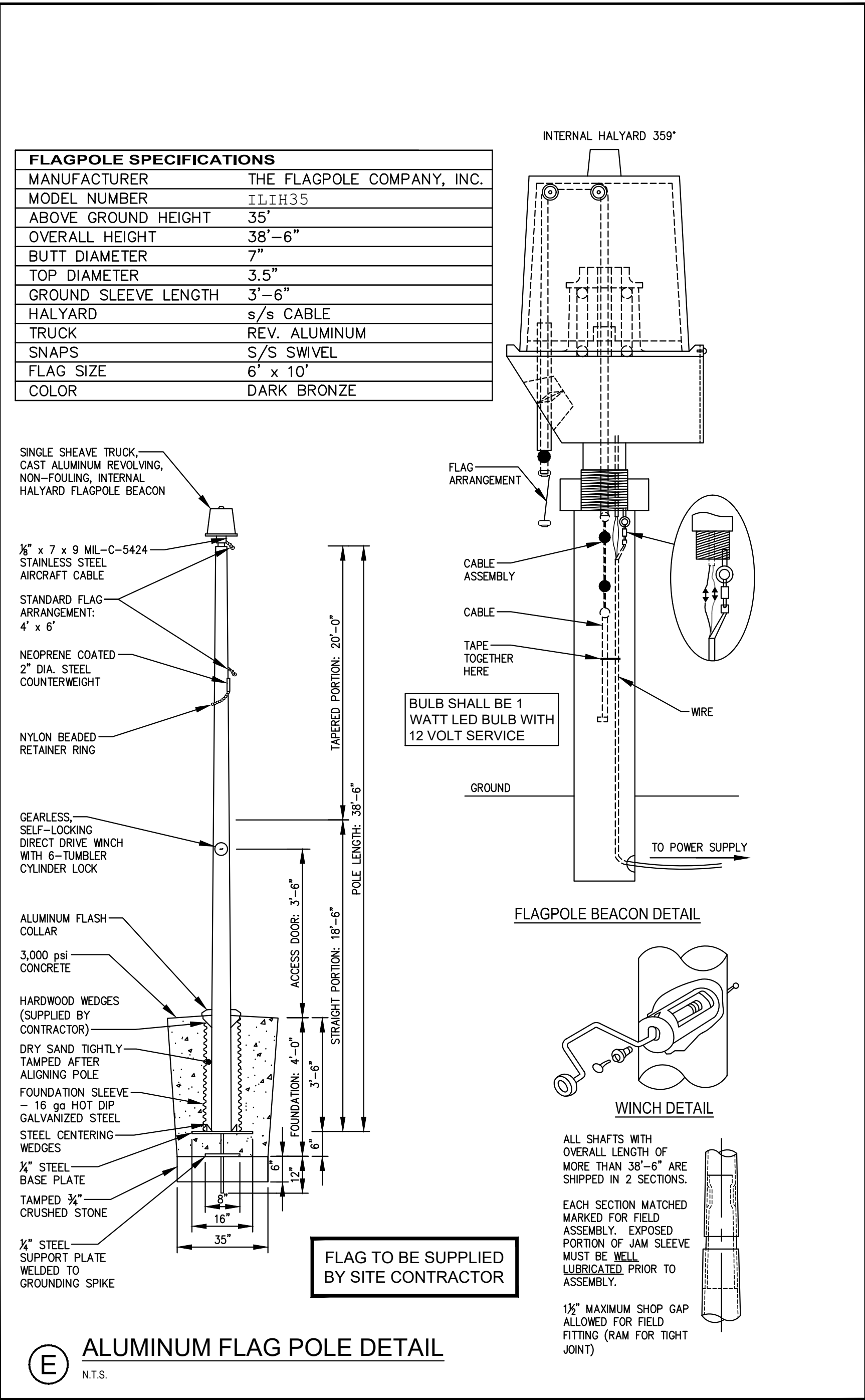
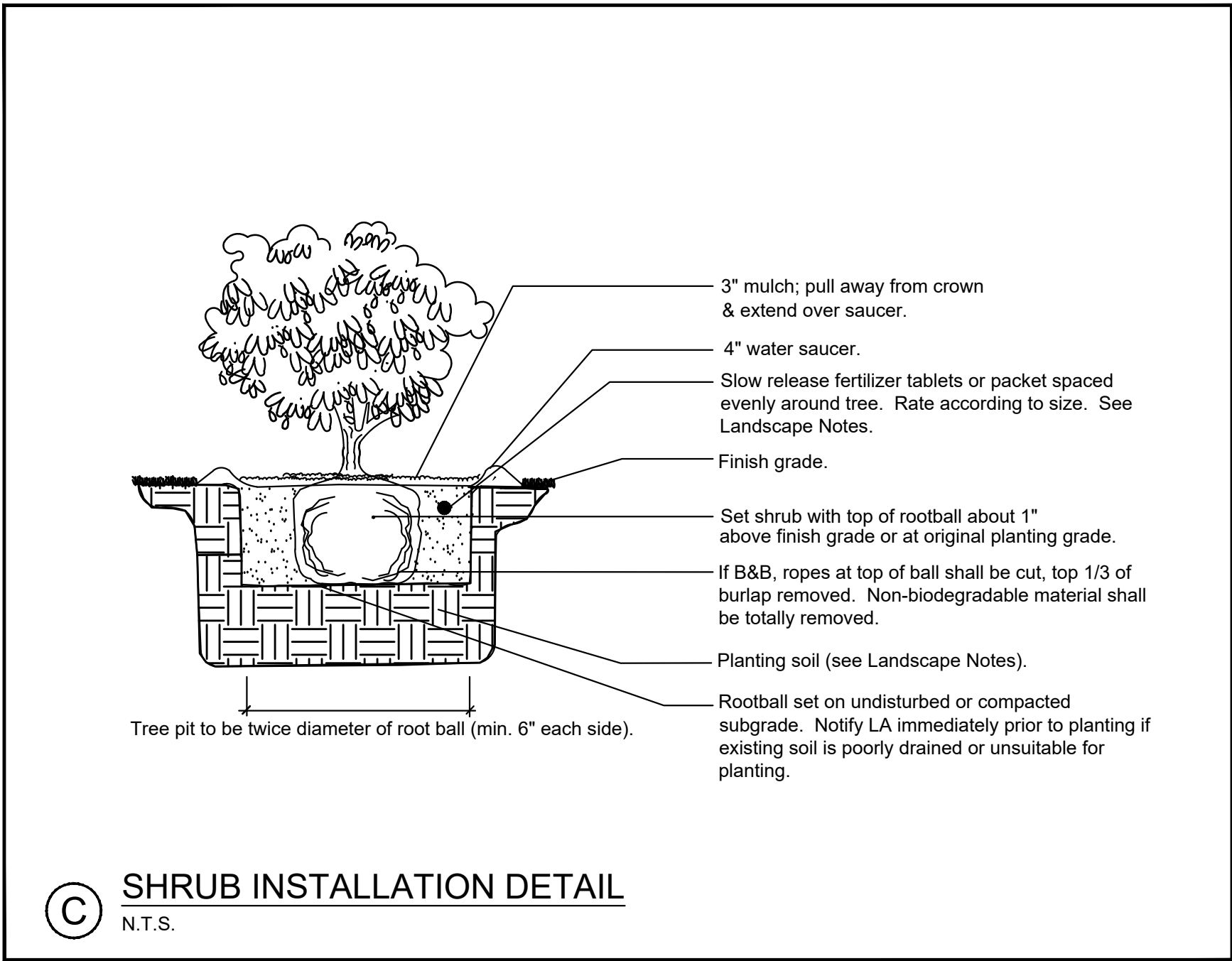
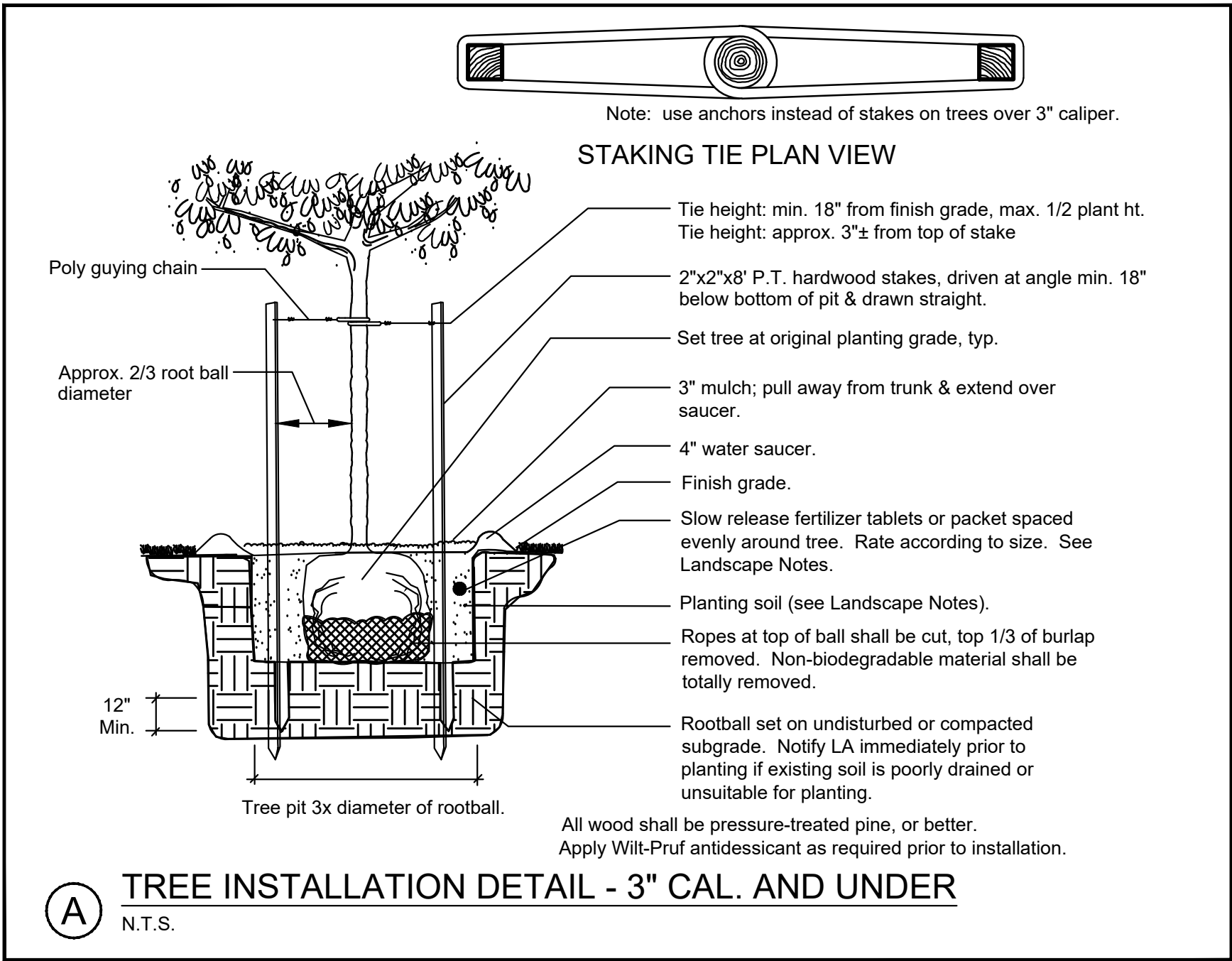
C-7.0

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STOCKPILE RESTORATION AREA PLANT LIST				
TYPE	SPECIES	SIZE	QTY	NOTES
TREES	Abies balsamea (White Fir); Betula lenta (Black Birch); Betula populifolia (Grey Birch); Juniperus virginiana (Red Cedar); Pinus rigida (Pitch Pine); Quercus alba (White Oak); Quercus prinus (Chestnut Oak); Quercus rubra (Red Oak);	3'-4' FT. HIGH (NO. 2 CONT.)	1 PER 325 SF.	Trees and shrubs to be planted in groups and located in the field by Owner Representative.
SHRUBS	Comptonia peregrina (Sweet Fern); Cornus racemosa (Grey Dogwood); Corylus americana (American Hazelnut); Rhus aromatic (Fragrant Sumac); Viburnum lentago (Nannyberry).	2'-3' FT. HIGH (NO. 2 CONT.)	1 PER 125 SF.	
SEEDING	New England Roadside Matrix Upland Seed Mix (New England Wetland Plants, Inc.)	APPL. RATE	1250 sq ft/b	

- NOTES:**
- The Contractor shall ensure clean fill including Topsoil, brought to the site is not from a site known to have invasive weeds that are listed on the Maine Natural Areas Program *Advisory List of Invasive Plants*. In addition, and in accordance with Section 4.7.4 of the City's Technical Manual, the Contractor is shall routinely inspect the site for invasive weeds during construction and remove any that are found through the use of physical means and/or the use of herbicides, applied according to all local, state and federal regulations.
 - See Sheet C-7.2 for Landscape Notes.
 - See Sheet C-7.0 for Plant List.



LANDSCAPE NOTES

- PLANTING OF TREES AND SHRUBS SHALL NOT OCCUR UNTIL ALL GRADING AND PAVING IS COMPLETED IN THE AREA.
- ALL PLANTS SHALL HAVE A NORMAL HABIT OF GROWTH FOR THE SPECIES AND SHALL BE SOUND, HEALTHY AND FREE OF DISEASE AND INSECTS. THEY SHALL CONFORM TO THE SIZE SPECIFICATION INDICATED ON THE PLANT LIST AND SHALL CONFORM TO ANSI Z60.1 - NURSERY STOCK, LATEST REVISION.
- ALL PLANTS SHALL HAVE ALL ROOTBALL WRAPPING MATERIALS (BURLAP, WIRE, STRING, ROPE, POTS, ETC.) REMOVED AT THE TIME OF PLANTING. REMOVE SOIL PLACED ABOVE ROOTS TO EXPOSE TRUNK FLARE AS NECESSARY TO DETERMINE SETTING LEVEL AND PIT DEPTH. CIRCLING ROOTS OR ROOTS THAT WOULD LATER GIRDLE THE PLANT SHALL BE STRAIGHTENED OR CUT OR THE ROOT BALL SHALL BE CUT UTILIZING THE "BUTTERFLY METHOD".
- BACKFILL MIX FOR ALL PLANT MATERIAL, EXCEPT TREES, SHALL BE COMPOSED OF TWO PARTS EXISTING SOIL AMENDED WITH ONE PART COMPOST, OR WITH ONE PART SANDY FILL IF HEAVY SOILS. TREE PITS SHALL BE BACKFILLED WITH EXISTING SOIL. PLANTING PITS SHALL BE EXCAVATED TO TWICE THE DIAMETER AND TO THE SAME DEPTH OF THE PLANT ROOT BALL. BACKFILL 1/2 OF DEPTH OF PIT AT A TIME AND COMPACT. REFER TO FERTILIZER MANUAL AND INSTALL SLOW RELEASE FERTILIZER AFTER FIRST BACKFILL LIFT.
- ALL PLANTINGS SHALL HAVE SLOW RELEASE FERTILIZER TABLETS INSTALLED. TABLETS SHALL BE AGRIFORM 21-GRAM 20-10-5 PLANTING TABLETS OR AN APPROVED EQUAL. APPLICATION RATE: PERENNIALS - 1 TABLET/PLANT. WOODY SHRUBS TO 3'-0" - 2 TABLETS/PLANT. SHRUBS AND TREES 3'-0" TO 6'-0"-3 TABLETS/PLANT AND TREES 6'-0" AND ABOVE - 4 TABLETS/PLANT. AFTER PLANTS ARE INSTALLED, LIQUID FEED ALL PLANTS WITH ROOTS OR AN APPROVED EQUAL. MIX ACCORDING TO MANUFACTURERS INSTRUCTIONS. APPLICATION RATE: PERENNIALS - 2 QT/PLANT, WOODY SHRUBS TO 4'-0" - 1.5 GAL/PLANT, TREES AND SHRUBS 4'-0" TO 10'-0" 3.0 GAL/PLANT AND TREES 10' AND ABOVE - 4.0 GAL/PLANT.
- ALL TREES REQUIRE A MINIMUM OF 2 STAKES EACH AND ALL SHALL BE GUYED OR STAKED. TREE STAKING MATERIAL SHALL BE REMOVED BY THE LANDSCAPE CONTRACTOR AFTER ONE GROWING SEASON.
- ALL PLANTINGS ARE IN MULCHED BEDS. ALL PLANTING BEDS SHALL BE FREE OF WEEDS OR GRASS PRIOR TO INSTALLATION OF MULCH. IF VEGETATION EXISTS, TREAT WITH HERBICIDE. MULCH SHALL BE MEDIUM SHREDDED BARK, 3" DEPTH. ALL PLANTINGS NOT IN BEDS OR ISLANDS SHALL HAVE MULCHED WATER RINGS ACCORDING TO THE DETAIL.
- ALL PLANTS SHALL HAVE THEIR LOCATIONS STAKED AND APPROVED BY THE LANDSCAPE ARCHITECT OR OWNER PRIOR TO PLANT INSTALLATION. ALL PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE.
- PLANT SPECIES SUBSTITUTIONS WILL NOT BE ALLOWED UNLESS FIRST APPROVED BY THE LANDSCAPE ARCHITECT, OWNER, AND MUNICIPAL AUTHORITY (IF APPLICABLE). ANY CHANGE TO PLANT SPECIES, DUE TO LACK OF AVAILABILITY DURING CONSTRUCTION, SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
- ALL PLANTS SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER. ANY PLANTS THAT DIE DURING THE GUARANTEE PERIOD SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER. A WRITTEN WARRANTY, WITH CONTRACTOR'S CONTACT INFORMATION, DATE OF ACCEPTANCE AND LENGTH OF GUARANTEE PERIOD SHALL BE SUBMITTED AS PART OF JOB CLOSEOUT.
- ALL AREAS NOT IDENTIFIED WITH OTHER SURFACE TREATMENTS SHALL BE LAWN. THE LAWN AREA SHALL BE LOAMED, SEEDED AND STRAW MULCHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAWN MAINTENANCE. MAINTENANCE SHALL COMMENCE AT THE TIME OF PLANTING AND CONTINUE UNTIL GRASS IS FULL AND ESTABLISHED AND ACCEPTED BY THE OWNER. SEE SHEET C-7.7 FOR SEED MIX DETAILS.
- ALLOW SHRUBS AND ORNAMENTAL GRASSES TO GROW TOGETHER TO FORM A NATURAL LOOKING PLANT MASS AND ALLOW EVERGREEN SHRUBS TO GROW TOGETHER TO FORM A SOLID GROUND COVER.
- IF QUANTITIES OF PLANTS LISTED IN THE PLANT LIST DO NOT CORRELATE WITH THOSE INDICATED ON THE PLAN, THE QUANTITIES ON THE PLAN SHALL GOVERN.
- REMOVE EXISTING GRASS AND WEEDS FROM ALL AREAS TO BE PLANTED PRIOR TO PLANT INSTALLATION. LOAM, SEED AND STRAW MULCH (OR OTHER SURFACE TREATMENT AS INDICATED) ALL AREAS DISTURBED BY CONSTRUCTION.

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES AND SHALL NOT BE USED FOR CONSTRUCTION.

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Rev.	Date	Revision
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TMP APPLICATION	11.22.19	SRB
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File Name: 3572-LANDSCAPE.dwg		
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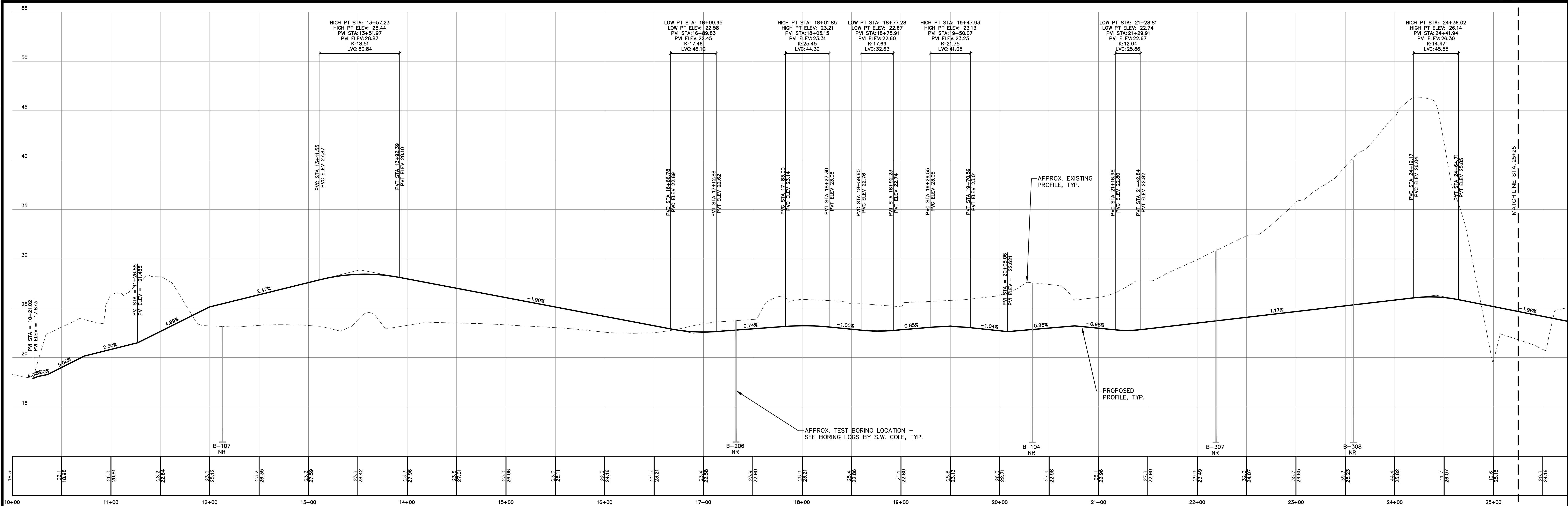
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Drawing Name:	LANDSCAPE DETAILS
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

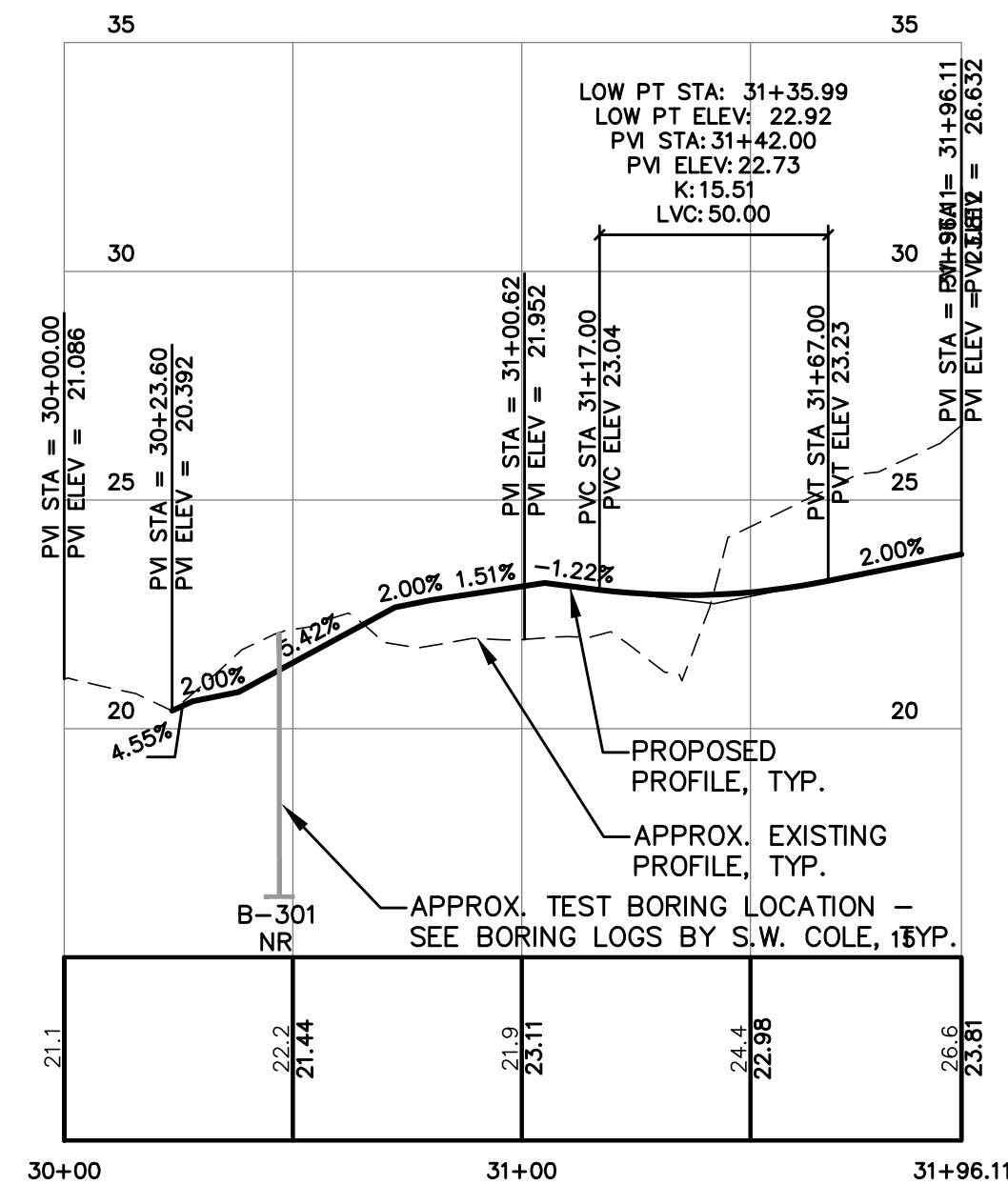
Drawing No.

C-7.2

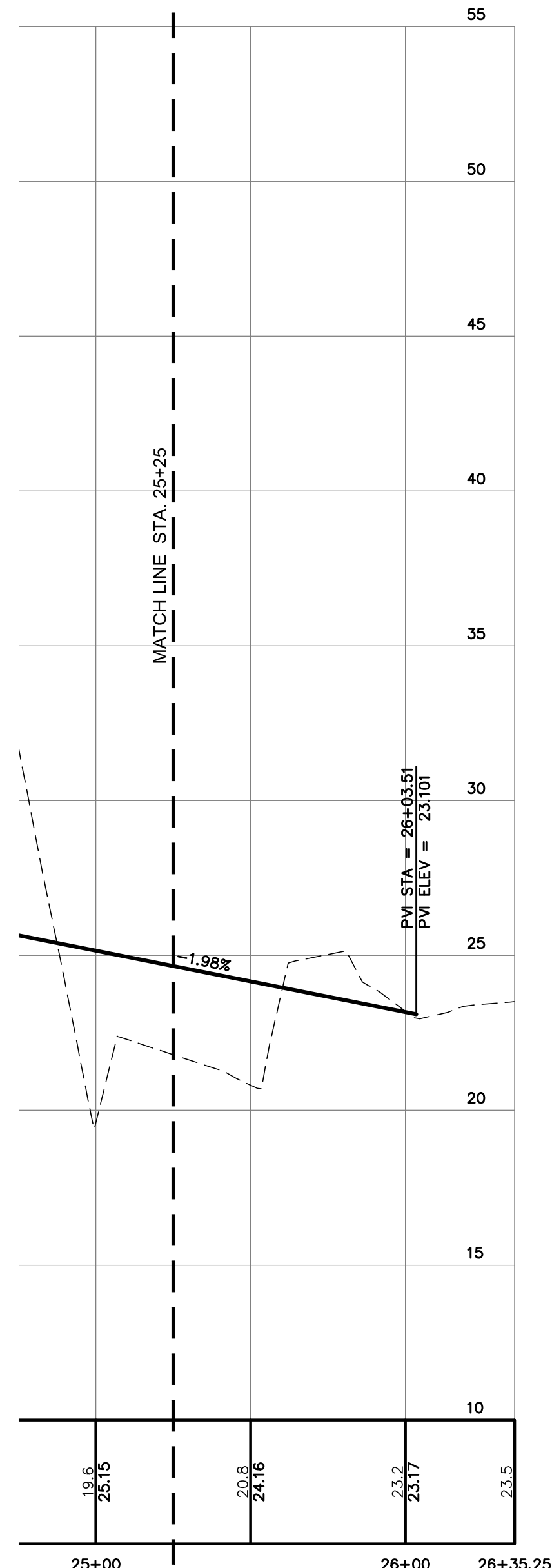
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ACCESS DRIVE 1 PROFILE
SCALE: 1" = 40' HORZ.
1" = 4' VERT.

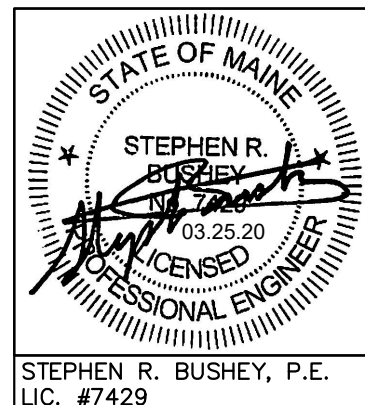


ACCESS DRIVE 2 PROFILE
SCALE: 1" = 40' HORZ.
1" = 4' VERT.



ACCESS DRIVE 1 PROFILE (CONTINUED)
SCALE: 1" = 40' HORZ.
1" = 4' VERT.

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.



Rev.	Date	Revision
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-grading.dwg		
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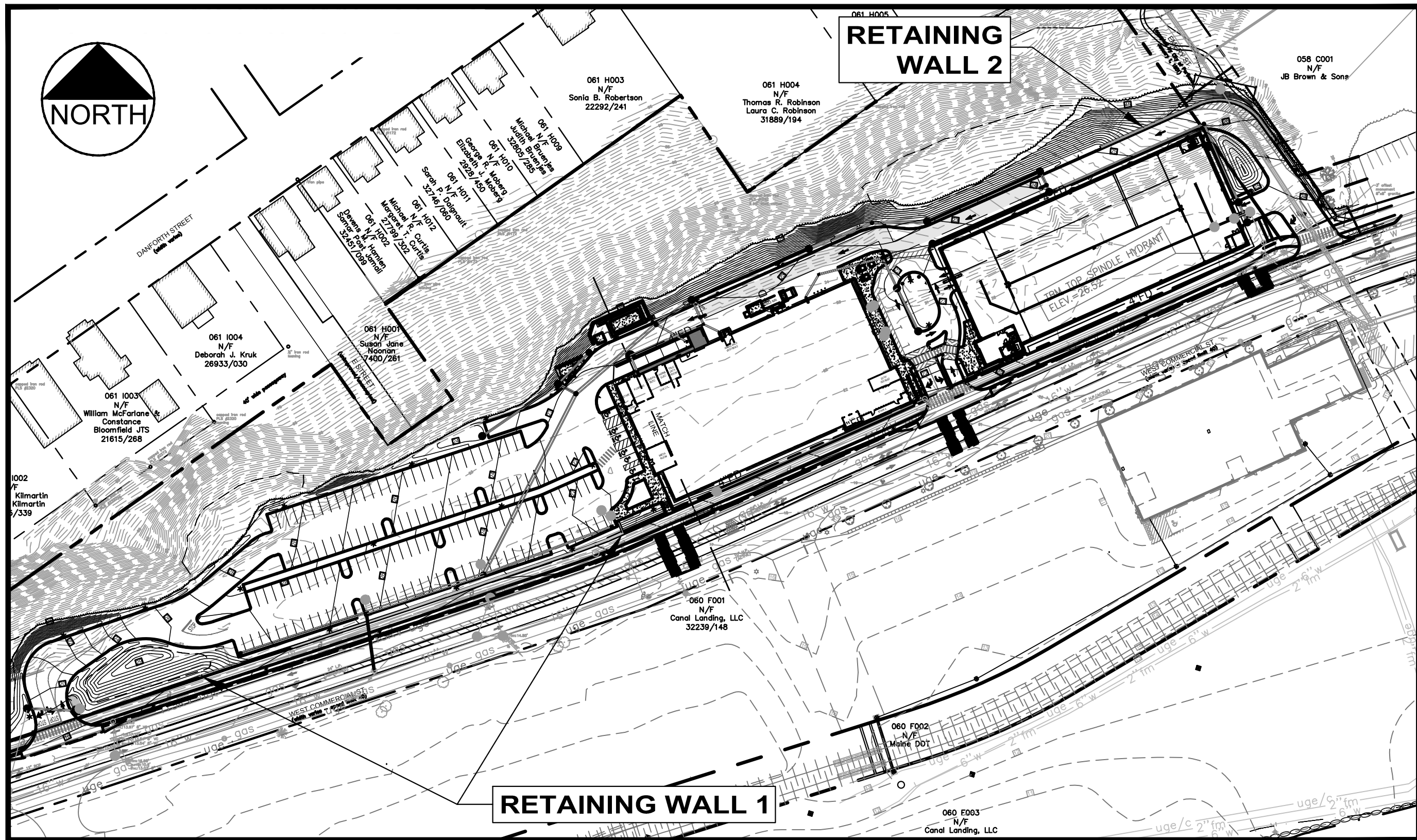


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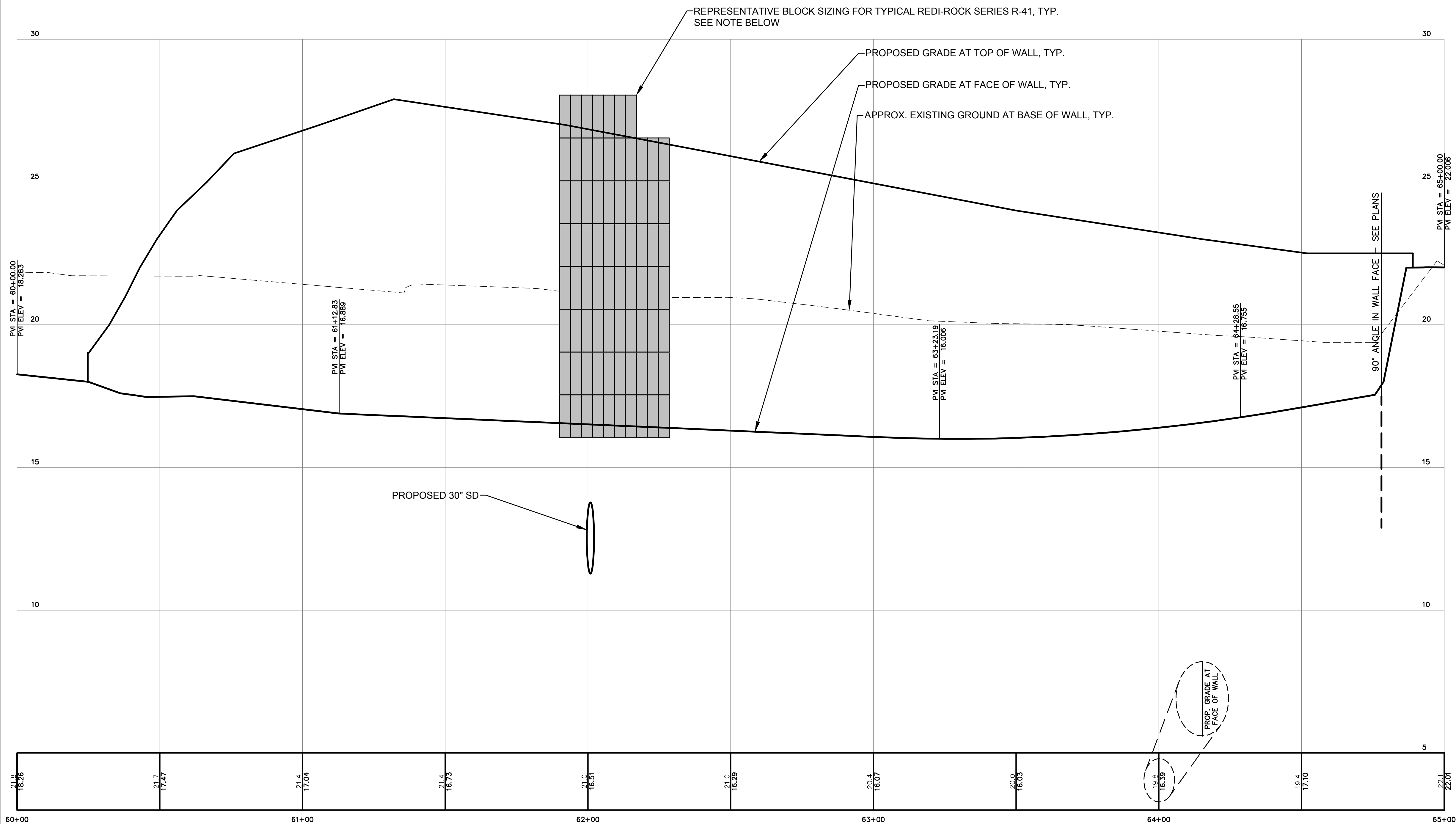
Drawing Name:	ACCESS DRIVE PROFILES
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 133 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-8.0
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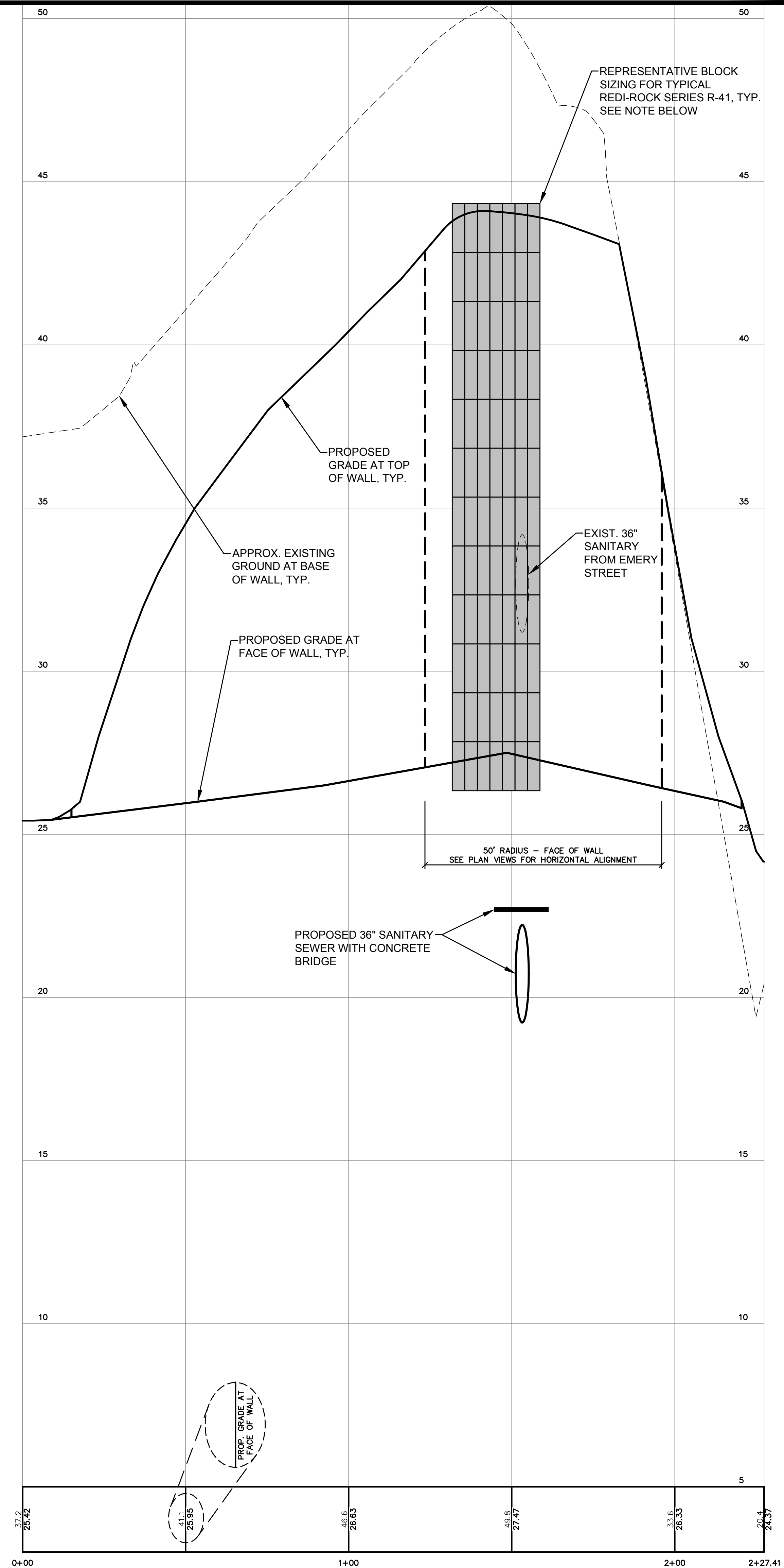


ORIENTATION SKETCH
SCALE: 1" = 100'



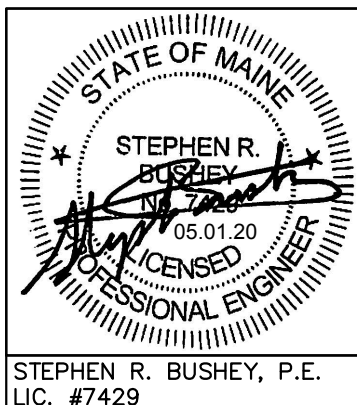
RETAINING WALL 1 PROFILE
SCALE: 1" = 20' HORIZ.
1" = 2' VERT.

NOTE:
THESE WALL PROFILES ARE STRICTLY INFORMATIONAL.
THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS
DESIGNED BY A STRUCTURAL ENGINEER LICENSED IN THE
STATE OF MAINE PRIOR TO CONSTRUCTION OF WALLS



RETAINING WALL 2 PROFILE
SCALE: 1" = 20' HORIZ.
1" = 2' VERT.

**NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES AND SHALL
NOT BE USED FOR
CONSTRUCTION.**



Rev.	Date	Revision
2	05.01.20	REVISED AND RESUBMITTED TO CITY
1	03.25.20	REVISED PER CITY REVIEW AND RESUBMITTED

RELEASED TO CONTRACTOR - 100% PRICING SET	04.08.20	SRB
RELEASED TO CONTRACTOR - 90% PRICING SET	03.06.20	SRB
LEVEL III SITE PLAN APPLICATION	01.20.20	SRB
TMP APPLICATION	11.22.19	SRB
Issued For	Date	By

Design: SRB	Draft: CDD	Date: NOV. 2019
Checked: SRB	Scale: AS NOTED	Job No.: 3572
File Name: 3572-grading.dwg		
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Drawing Name:	RETAINING WALL PROFILES
Project:	U.S. Department of Veterans Affairs - Community Based Outpatient Clinic 141 West Commercial Street, Portland, Maine
Client:	FDS JBB PORTLAND, LLC 10 Free Street, Portland, Maine 04101

Drawing No.	C-8.1
-------------	-------

VA PORTLAND CBOC

141 W. COMMERCIAL ST.
PORTLAND, MAINE 04102

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CIVIL / I A
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SOUTH PORTLAND, ME 04106
207.772.2515

LJB Inc.
STRUCTURAL
2500 NEWMARK DRIVE
MIAMISBURG, OH 45342
937.259.5000

[illegible]

SEALS AND SIGNATURES

NOT FOR
CONSTRUCTION

SHEET TITLE

BUILDING IMAGERY

PROJECT NUMBER

G1.2-CS

SHEET NUMBER





PLANNING BOARD REPORT PORTLAND, MAINE

Forest Avenue Substation Expansion Project
14 Marginal Way
Level III Conditional Use
Central Maine Power, Applicant
Project #: CU-001086-2020

Submitted to: Portland Planning Board
Public Hearing Date: May 12, 2020

Prepared by: Shukria Wiar, Planner
Date: May 8, 2020

I. INTRODUCTION

Central Maine Power (CMP) has applied for a Level III Conditional Use and a Level II Site Plan approval for a single story, 2,944 sf building and two new power station service transformers as part of the CMP Union Street Substation upgrade project located at 14 Marginal Way. The lot is 39,300 sf in size and is located within the B-7 Mixed Development District Zone. The project proposes to update, redesign, and expand the existing substation which will increase reliability, stability, and remote monitoring capability for CMP.

The use and proposed expansion in the use of a substation in B-7 zone requires a Conditional Use Permit to be approved by the Planning Board. The proposed development will need meet the requirements of the B-7 Conditional Use standards Section 14-296 and Section 14-474 (general standards in that apply to all conditional uses).



The Planning Authority reviewed the proposal for conformance with the standards of Portland's site plan ordinance, as well as the B-7 Design Standards, and approved the site plan with conditions, [Attachment 1](#).

Property Owner:	Central Maine Power Company
Applicant:	Central Maine Power Company
Agent and Engineer:	James Morin, Burns and McDonnell
Architect:	Sameer Mathur, Burns and McDonnell
Surveyor:	Stephen Gould, Sackett and Brake

II. REQUIRED REVIEWS

<i>Applicant's Proposal</i>	<i>Applicable Standards</i>
New Structure Under 50,000 SF	Level II Site Plan
Conditional Use for Substations in B-7 zone	Level III Conditional Use in the B-7 zone (Section 14-296)
Design Review	B-7 Design Standards

III. PROJECT DATA

<i>SUBJECT</i>	<i>DATA</i>
Total area of the site	37,303 sf
Total Disturbed Area	37,026 sf
Existing Zoning	B-7
Existing Use	Substation
Proposed Use	Substation
Impervious Surface Area	
--Existing	11,676 sf
--Proposed	21,881 sf
--Net Change	-10,205 sf
Building Floor Area	
--Existing	134 sf
--Proposed	6,022 sf
-Net Change	+5,078 sf
Estimated Cost of the project:	unknown

IV. PUBLIC COMMENT

A notice of this Hearing was sent to thirty-two (32) property owners within 500 feet and interested citizens, and appeared in the May 4th and 5th, 2020 editions of the *Portland Press-Herald*. A Neighborhood Meeting is not required for this project and the Planning Division has not received any public comments.

V. RIGHT, TITLE AND INTEREST AND FINANCIAL/TECHNICAL CAPACITY

The owner of the property is Central Maine Power Company. The applicant has provided a copy of quitclaim deed, recorded at the Cumberland County Registry of Deeds (Book 3523 Page 84), which demonstrates their right, title and interest in the property.

The estimated cost of the development is unknown. The applicant has submitted a letter from Central Maine Power Company, as demonstration of their financial and technical capacity to complete the proposed development, Attachment H.

VI. STAFF REVIEW

A. ZONING ASSESSMENT

The proposal is a conditional use in the B-7 zone and meets all of the B-7 dimensional requirements.

B. CONDITIONAL USE REVIEW

Utility stations are permitted in the B-7 zone as conditional use, requiring review by the Planning Board. The applicant has submitted an analysis addressing how the proposal meets the B-7 Conditional Use Standards (Attachment B) and staff confirm that the project meets the requirements of the conditional use standards as follows:

Sec. 14-296. Conditional uses. (a) The following uses shall be permitted as conditional uses in the B-7 zone as provided in section 14-474 (conditional uses), provided that, notwithstanding 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:

*4. Utility substations including wastewater collection and pumping stations, water pumping stations, transfer stations, telephone electronic equipment enclosures, **electrical transmission and distribution***

substations and similar structures larger than one-hundred (100) square feet of floor area are permitted provided the following standards are met:

- a. Notwithstanding sec. 14-298 (maximum setback) utility substations shall be setback no less than thirty-five (35) feet from the street right-of-way except in the case of a lot having frontage on Marginal Way and I-295 provided the minimum thirty-five (35) foot setback is met along Marginal Way; and*

Staff Comments: The substation building and improvements are outside the thirty-five (35) foot setback along Marginal Way. The site plan shows the thirty-five (35) foot setback along Marginal Way and Forest Avenue, Attachment B.

- b. The applicant demonstrates that the structure is as small in size as practicable; and*

Staff Comments: In order to meet future energy needs for the serviceable area, the CMP substation needs to be upgraded with components that include two new transformers with four separate sets of gas insulated switchgear). The CMP substation has been designed to be "as small in size as practicable" while trying to meet the need for future energy distribution.

- c. The remainder of the lot not consumed by the utility substation and its related access; and shall be designed and designated for future development; and*

Staff Comments: The property located at this site is owned by CMP. According to this application, "the project includes expanding the substation yard and installing new technology, infrastructure and corresponding updates that include two new transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single-story, climate-controlled control house". Due to these improvements, CMP has developed the whole site, therefore there is no chance of any other developments.

- d. The substation equipment is fully enclosed within a structure.*

Staff Comments: The substation is a single-story building, which will contain the switchgear, station service batteries and other protection, control and communication equipment. Due to the nature of the substation operation, there are some components that are operated outdoors, such as transformers. The transformers will be surrounded by a three-sided, 16-foot 8-inch-tall firewall made of concrete material, thereby enclosed from the public.

The following standards in 14-474 apply to all conditional uses:

1. *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*

Staff comment: The traffic generation for the proposed use will stay the same and the parking layout and circulation area is not substantially greater that would normally occur at surrounding uses.

- 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*

Staff comment: The proposal would not create harmful conditions.

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.

Staff comment: The design and operation of the proposed use is anticipated to have similar or fewer effects/impacts than surrounding uses.

VII. STAFF RECOMMENDATION

Subject to the proposed motions and conditions of approval listed below, Planning Division staff recommends that the Planning Board approve the proposed substation building at 14 Marginal Way. The applicant has worked to meet the relevant standards.

VIII. PROPOSED MOTIONS

A. CONDITIONAL USE

On the basis of the application, plans, reports and other information submitted by the applicant, the findings and recommendations contained in the Planning Board Report for the public hearing on May 12, 2020 for application CU-001086-2020 relevant to Portland's Conditional Use Standards and other regulations, and the testimony presented at the Planning Board hearing:

The Planning Board finds the proposed conditional use for the expansion of the substation use [does or does not] meet the standards of Section 14-484 and Section 14-296 for the B-7 zone.

IV. ATTACHMENTS

PLANNING BOARD REPORT ATTACHMENTS

1. Level II Site Plan Approval
2. Site Plan Memo
3. Department of Public Works review (memo from Mike Tremblay)
4. City Arborist review (memo from Jeff Tarling)
5. Design Review (memo from Caitlin Cameron)
6. Consulting Civil Engineer Review (memo from Lauren Swett)

APPLICANT'S SUBMITTAL

- A. Level-II-Site-Plan-and-Subdivision-Checklist
- B. Level II Site Plan Narrative
- C. Project Summary Cover Letter_cmplogo
- D. Staff Review Response Letter
- E. 4-7-2020 Staff review response letter_FINAL
- F. Zoning Analysis Table
- G. CMP Cert of Good Standing
- H. CMP Technical Capabilities
- I. Construction Management Plan
- J. Forest Ave Deeds
- K. Lighting Catalog Cut Sheets
- L. Forest Ave Stormwater Management Study

PLANS

Plan 1	Boundary Survey_2017180 24X36 2-27-18
Plan 2	Site Plan.pdf
Plan 3	Site Utility Plan
Plan 4	Layout_General Arrangement Plan
Plan 5	Grading and Drainage Plan
Plan 6	Erosion Control Plan
Plan 7	Erosion Control Details
Plan 8	Erosion Control Notes
Plan 9	Yard Lighting ¹
Plan 10	Yard Lighting ²
Plan 11	Site Details 1 of 4
Plan 12	Site Details 2 of 4
Plan 13	Site Details 3 of 4
Plan 14	Site Details 4 of 4
Plan 15	Control House FOUNDATION PLAN ¹
Plan 16	FOUNDATION PLAN layout overview
Plan 17	Control House FOUNDATION PLAN ²
Plan 18	Control House layout SH 001
Plan 19	Control House layout SH 002
Plan 20	Control House layout SH 003
Plan 21	Control House Plan_Interior layout
Plan 22	Control House Plans_Parkline
Plan 23	Control House-FOUNDATION DETAILS ¹
Plan 24	Control House-FOUNDATION DETAILS ²
Plan 25	General Arrangement SH ¹
Plan 26	Control house-FOUNDATION DETAILS ³
Plan 27	General Arrangement SH ²
Plan 28	Transformer Firewall Foundation details
Plan 29	Transformer FOUNDATION DETAILSS
Plan 30	Typical Security Fence Details



Att. I

CITY OF PORTLAND
Planning & Urban Development
Christine Grimando, AICP, Director

May 6, 2020

Jeremy Pettengill
Central Maine Power Company
83 Edison Drive
Augusta, ME 04101

James Morin
Burns and McDonnell
27 Pearl Street
Portland, ME 04101

Project Name: Forest Avenue Substation Project
Address: 14 Marginal Way
Applicant: Central Maine Power Company
Planner: Shukria Wiar

Project ID: PL-000959-2020
CBL: 113 A013001

Dear Mr. Pettengill:

On May 6, 2020, the Planning Authority approved a Level II Site Plan application for the expansion of the existing Forest Avenue substation at 14 Marginal Way. The decision is based upon the application, documents and plans as submitted. The proposal was reviewed for conformance with the standards of Portland's Site Plan Ordinance and Mixed Development District Zone B-7 Design Standards.

Site Plan Review

The Planning Authority finds that the plan is in conformance with the site plan standards of the Land Use Code, subject to the following conditions of approval:

PRIOR TO THE ISSUANCE OF A BUILDING PERMIT

1. The applicant shall add a note to the landscaping plan which indicates that the applicant or their designee will meet with the city's arborist on site prior to planting in order to review plant placement details in the field;
2. The applicant shall provide a revised construction management site plan, including the details regarding safe pedestrian detours and ADA compliance sidewalk for review and approval by the Department of Public Works;
3. The applicant shall:
 - a. Submit revised elevations showing full cutoff light fixtures on the building or add shielding as necessary in order to minimize light trespass to the adjacent property, in accordance with the cut sheets provided;
 - b. Provide an updated lighting plan, including maximum, minimum, and average illumination levels, based on the proposed light fixtures and add a note to the lighting plan which indicates that the transformer lights will be switched on only temporarily for maintenance or emergency purposes

The approval is based on the submitted plans and the findings related to site plan review standards in the application PL-000959-2020 which is attached.

Standard Procedures

Note: The following standard conditions of approval and requirements apply to all approved site plans:

1. Site Plan Expiration The site plan approval will be deemed to have expired unless work has commenced within one (1) year of the approval or within a time period up to three (3) years from the approval date as agreed upon in writing by the City and the applicant. Requests to extend approvals must be received before the one (1) year expiration date.
2. Separate Building Permits Are Required This approval does not constitute approval of building plans, which must be reviewed and approved by the City of Portland's Permitting and Inspections Department.
3. Performance Guarantee and Inspection Fees A performance guarantee covering the site improvements and an inspection fee payment of 2.0% of the guarantee amount and three (3) final sets of plans must be submitted to and approved by the Planning and Urban Development Department and Public Works Department prior to the release of a building permit, street opening permit or certificate of occupancy for site plans.
7. Construction Management Plans The applicant, contractor and subcontractors are required to conform to the approved Construction Management Plan, and all conditions contained within the project's approval, for the entire duration of the project. Any amendments to the approved Construction Management Plan shall be reviewed and approved by the Department of Public Works prior to the execution. The Planning Authority and the Department of Public Works have the right to seek revisions to an approved Construction Management Plan. The applicant shall coordinate the project's construction schedule with the timing of nearby construction activities to avoid cumulative impacts on a neighborhood and prevent unsafe vehicle and pedestrian movements. Accordingly, nearby construction activities could involve a delay in the commencement of construction.
8. Preconstruction Meeting Prior to the release of a building permit and scheduling of a preconstruction meeting, a hard copy set of approved plans shall be submitted to the Development Review Coordinator. A pre-construction meeting shall be held at the project site with the contractor, Development Review Coordinator, Public Works representative and owner to review the construction schedule and critical aspects of the site work. At that time, the Development Review Coordinator will confirm that the contractor is working from the approved site plan and the approved Construction Management Plan. The site/building contractor shall provide one (1) copy 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 pre-construction meeting.
9. Department of Public Works Permits If work or obstructions will occur within the public right-of-way, such as utilities, curb, sidewalk, driveway construction, site deliveries and equipment siting, a Street Opening and/or Occupancy Permits are required for your site. Please contact the Department of Public Works Permit Clerk at (207) 874-8300, ext. 8828. (Only excavators licensed by the City of Portland are eligible.)
10. Develop Site According to Plan The site shall be developed and maintained as depicted on the site plan and in the written submission of the applicant. Any modifications of an approved site

plan or alteration of a parcel, which was the subject of site plan approval after May 20, 1974, shall require the prior approval of an amended site plan by the Planning Board or Planning Authority pursuant to the terms of Chapter 14, Land Use, of the Portland City Code.

11. Design Review of Exterior Elevations If the project is subject to design review, then the exterior elevations shall be constructed and maintained as depicted on the approved elevation drawings and in the written submission of the applicant. Modification of any approved exterior elevations shall require the approval of the revised plans by the Planning Board or Planning Authority pursuant to the terms of Chapter 14, Land Use of the Portland City Code.
12. Defect Guarantee A defect guarantee, consisting of 10% of the performance guarantee, must be posted before the performance guarantee will be released.
13. As-Built Final Plans 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.
14. Mylar Copies Mylar copies of the as-built drawings for the public streets and other public infrastructure in the subdivision must be submitted to Public Works prior to the issuance of a certificate of occupancy.
15. Impact Fees New development or changes of use that result in net new residential dwelling units, non-residential building square footage, or water meters, are subject to the City of Portland's impact fee ordinance (Chapter 14, Article XVII). Impact fees are calculated at the time of building permit and must be paid prior to the certificate of occupancy. For more information, visit <https://www.portlandmaine.gov/2409/Impact-Fees>

The Development Review Coordinator must be notified five (5) working days prior to the date required for final site inspection. The Development Review Coordinator can be reached at the Planning and Urban Development Department at (207) 874-8632. All site plan requirements must be completed and approved by the Development Review Coordinator prior to issuance of a Certificate of Occupancy. Please schedule any property closing with these requirements in mind.

If there are any questions, please contact Shukria Wiar at (207) 756-8080 or via shukriaw@portlandmaine.gov

Sincerely,

Christine Grimando, AICP
Director

Attachments:

1. Planning Board Report
2. Sample Stormwater Maintenance Agreement
3. Performance Guarantee Packet



Memorandum PORTLAND, MAINE

Forest Avenue Substation Expansion Project
14 Marginal Way
Level III Conditional Use
Central Maine Power, Applicant
Project #: PL-000959-2020 and
CU-001086-2020

Prepared by: Shukria Wiar, Planner
Date: May 6, 2020

I. INTRODUCTION

Central Maine Power (CMP) has applied for a Level III Conditional Use and a Level II Site Plan approval for a single story, 2,944 sf building and two new power station service transformers as part of the CMP Union Street Substation upgrade project located at 14 Marginal Way. The lot is 39,300 sf in size and is located within the B-7 Mixed Development District Zone. The project proposes to update, redesign, and expand the existing substation which will increase reliability, stability, and remote monitoring capability for CMP.

The use and proposed expansion in the use of a substation in B-7 zone requires a Conditional Use Permit to be approved by the Planning Board. The proposed development will need meet the requirements of the B-7 Conditional Use standards Section 14-296 and Section 14-474 (general standards in that apply to all conditional uses).



The Planning Authority reviewed the proposal for conformance with the standards of Portland's site plan ordinance, as well as the B-7 Design Standards, and approved the site plan with conditions.

Property Owner:	Central Maine Power Company
Applicant:	Central Maine Power Company
Agent and Engineer:	James Morin, Burns and McDonnell
Architect:	Sameer Mathur, Burns and McDonnell
Surveyor:	Stephen Gould, Sackett and Brake

II. REQUIRED REVIEWS

<i>Applicant's Proposal</i>	<i>Applicable Standards</i>
New Structure Under 50,000 SF	Level II Site Plan
Conditional Use for Substations in B-7 zone	Level III Conditional Use in the B-7 zone (Section 14-296)
Design Review	B-7 Design Standards

III. PROJECT DATA

SUBJECT	DATA
Total area of the site	37,303 sf
Total Disturbed Area	37,026 sf
Existing Zoning	B-7
Existing Use	Substation
Proposed Use	Substation
Impervious Surface Area	
--Existing	11,676 sf
--Proposed	21,881 sf
--Net Change	-10,205 sf
Building Floor Area	
--Existing	134 sf
--Proposed	6,022 sf
--Net Change	+5,078 sf
Estimated Cost of the project:	unknown

IV. PUBLIC COMMENT

A notice of this Hearing was sent to thirty-two (32) property owners within 500 feet and interested citizens, and appeared in the May 4th and 5th, 2020 editions of the *Portland Press-Herald*. A Neighborhood Meeting is not required for this project and the Planning Division has not received any public comments.

V. RIGHT, TITLE AND INTEREST AND FINANCIAL/TECHNICAL CAPACITY

The owner of the property is Central Maine Power Company. The applicant has provided a copy of quitclaim deed, recorded at the Cumberland County Registry of Deeds (Book 3523 Page 84), which demonstrates their right, title and interest in the property.

The estimated cost of the development is unknown. The applicant has submitted a letter from Central Maine Power Company, as demonstration of their financial and technical capacity to complete the proposed development.

VI. STAFF REVIEW

A. ZONING ASSESSMENT

The project is located within the B-7 zone on the intersection of Forest Avenue and Marginal Way; for the propose of the review, the Marginal Way will be the frontage. Under the Level II Site Plan application, the project was reviewed for compliance with the zoning and dimensional standards. The proposal is a conditional use in the B-7 zone. The project meets all of the B-7 dimensional requirements.

	Required	Proposed
Lot Size	None	0.856 ac
Area Per Dwelling Unit	NA	NA
Minimum Street Frontage	None	Meets Standard
Front Yard Minimum	35'	35'
Front Yard Maximum	None	Meets Standard
Rear Yard	None	Meets Standard
Yard Right	None	Meets Standard
Yard Left	None	Meets Standard
Side Street Setback	None	Meets Standard
Step Back	None	Meets Standard
Maximum Lot Coverage	100%	Meets Standard
Minimum Lot Coverage		
Maximum Height	125'	22'
Open Space		
Maximum Impervious Area		21,881 sq. ft.
Pavement Setback		
Floor Area Ratio		
Off Street Parking Spaces		gravel yard
Loading Bays		NA
Other 1		
Other 2		
Other 3		

B. CONDITIONAL USE REVIEW

Utility stations are permitted in the B-7 zone as conditional use, requiring review by the Planning Board. The applicant has submitted an analysis addressing how the proposal meets the B-7 Conditional Use Standards and staff confirm that the project meets the requirements of the conditional use standards as follows:

Sec. 14-296. Conditional uses. (a) The following uses shall be permitted as conditional uses in the B-7 zone as provided in section 14-474 (conditional uses), provided that, notwithstanding 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:

4. Utility substations including wastewater collection and pumping stations, water pumping stations, transfer stations, telephone electronic equipment enclosures, electrical transmission and distribution substations and similar structures larger than one-hundred (100) square feet of floor area are permitted provided the following standards are met:

a. Notwithstanding sec. 14-298 (maximum setback) utility substations shall be setback no less than thirty-five (35) feet from the street right-of-way except in the case of a lot having frontage on Marginal Way and I-295 provided the minimum thirty-five (35) foot setback is met along Marginal Way; and

Staff Comments: The substation building and improvements are outside the thirty-five (35) foot setback along Marginal Way. The site plan shows the thirty-five (35) foot setback along Marginal Way and Forest Avenue.

b. The applicant demonstrates that the structure is as small in size as practicable; and

Staff Comments: In order to meet future energy needs for the serviceable area, the CMP substation needs to be upgraded with components that include two new transformers with four separate sets of gas insulated switchgear). The CMP substation has been designed to be "as small in size as practicable" while trying to meet the need for future energy distribution.

c. The remainder of the lot not consumed by the utility substation and its related access; and shall be designed and designated for future development; and

Staff Comments: The property located at this site is owned by CMP. According to this application, “the project includes expanding the substation yard and installing new technology, infrastructure and corresponding updates that include two new transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single-story, climate-controlled control house”. Due to these improvements, CMP has developed the whole site, therefore there is no chance of any other developments.

d. The substation equipment is fully enclosed within a structure.

Staff Comments: The substation is a single-story building, which will contain the switchgear, station service batteries and other protection, control and communication equipment. Due to the nature of the substation operation, there are some components that are operated outdoors, such as transformers. The transformers will be surrounded by a three-sided, 16-foot 8-inch-tall firewall made of concrete material, thereby enclosed from the public.

The following standards in 14-474 apply to all conditional uses:

1. *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

Staff comment: The traffic generation for the proposed use will stay the same and the parking layout and circulation area is not substantially greater that would normally occur at surrounding uses.

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

Staff comment: The proposal would not create harmful conditions.

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.

Staff comment: The design and operation of the proposed use is anticipated to have similar or fewer effects/impacts than surrounding uses.

C. DEVELOPMENT REVIEW (SITE PLAN STANDARDS in Section 14-526)

The proposed development has been reviewed by staff for conformance with the relevant review standards of Portland’s site plan ordinance and applicable regulations, and meets the standards except in a few cases where suggested conditions are recommended to fully address site plan standards.

1. *Transportation Standards*

Impact on Surrounding Street system, Access and Circulation

The site plan has been reviewed by Tom Errico, Consultant Traffic Engineer, and is okay with the access and circulation. The project will not generate traffic and will not impact to the surrounding street system.

2. *Environmental Quality Standards*

Landscape Preservation, Buffers and Parking Lot Landscaping

Jeff Tarling has reviewed and wanted more trees which the applicant adheres to and has added more landscaping, as shown on the revised site plan.

Water quality; Stormwater Management; Erosion Control:

The project has been reviewed by Lauren Swett, Consultant Civil Engineer, and the applicant has fully addressed those comments.

3. *Public Infrastructure and Community Safety Standards*

Public Safety and Fire Prevention

The proposals are generally acceptable in relation to the CPTED standards which encourage natural surveillance, access control, and territorial reinforcement. The Fire Department has confirmed that the proposals meet conditions in respect of access, hydrants, and construction.

Public Utilities

The applicant sent letters to the Portland Water District and Portland Department of Public Services in respect of the water supply and sewerage capacity. Confirmation of capacity has not yet been received and a suggested condition of approval has been included requiring these be received before the issuance of a building permit.

4. *Site Design Standards*

Historic Resources: Not applicable.

Exterior Lighting: The applicant has submitted a photometric plan. The plan omits some of the information required (such as the specs for the lights to confirm they are full cut-off) and shows levels considerably above the Technical Standards for trespass along the eastern boundary. While this boundary is not “sensitive” at this area since it abuts surface parking for Bangor Savings Bank, the high lighting levels could impact a future development or use of the site. Staff recommend a condition that requires a revised lighting plan with further details and revised levels to meet these concerns.

B7 Design Standards: the applicant has been working with the Planning Division’s Urban Designer Caitlin Cameron to address the extensive B7 Design Guidelines and Standards. Ms. Cameron’s final comments are included as and confirm that most of the associate requirements have been met.

VII. STAFF RECOMMENDATION

Planning Division staff recommends the approval of the proposed Site Plan associated with this proposal with the following conditions:

PRIOR TO THE ISSUANCE OF A BUILDING PERMIT

1. The applicant shall add a note to the landscaping plan which indicates that the applicant or their designee will meet with the city’s arborist on site prior to planting in order to review plant placement details in the field;
2. The applicant shall provide a revised construction management site plan, including the details regarding safe pedestrian detours and ADA compliance sidewalk for review and approval by the Department of Public Works;
3. The applicant shall:
 - a. Submit revised elevations showing full cutoff light fixtures on the building or add shielding as necessary in order to minimize light trespass to the adjacent property, in accordance with the cut sheets provided;
 - b. Provide an updated lighting plan, including maximum, minimum, and average illumination levels,

based on the proposed light fixtures and add a note to the lighting plan which indicates that the transformer lights will be switched on only temporarily for maintenance or emergency purposes.

IV. ATTACHMENTS

PLANNING BOARD REPORT ATTACHMENTS

1. Level II Site Plan Approval
2. Site Plan Memo
3. Department of Public Works review (memo from Mike Tremblay)
4. City Arborist review (memo from Jeff Tarling)
5. Design Review (memo from Caitlin Cameron)
6. Consulting Civil Engineer Review (memo from Lauren Swett)

APPLICANT'S SUBMITTAL

- A. Level-II-Site-Plan-and-Subdivision-Checklist
- B. Level II Site Plan Narrative
- C. Project Summary Cover Letter_cmplogo
- D. Staff Review Response Letter
- E. 4-7-2020 Staff review response letter_FINAL
- F. Zoning Analysis Table
- G. CMP Cert of Good Standing
- H. CMP Technical Capabilities
- I. Construction Management Plan
- J. Forest Ave Deeds
- K. Lighting Catalog Cut Sheets
- L. Forest Ave Stormwater Management Study

PLANS

- | | |
|---------|--|
| Plan 1 | Boundary Survey_2017180 24X36 2-27-18 |
| Plan 2 | Site Plan.pdf |
| Plan 3 | Site Utility Plan |
| Plan 4 | Layout_General Arrangement Plan |
| Plan 5 | Grading and Drainage Plan |
| Plan 6 | Erosion Control Plan |
| Plan 7 | Erosion Control Details |
| Plan 8 | Erosion Control Notes |
| Plan 9 | Yard Lighting ₁ |
| Plan 10 | Yard Lighting ₂ |
| Plan 11 | Site Details 1 of 4 |
| Plan 12 | Site Details 2 of 4 |
| Plan 13 | Site Details 3 of 4 |
| Plan 14 | Site Details 4 of 4 |
| Plan 15 | Control House FOUNDATION PLAN ₁ |
| Plan 16 | FOUNDATION PLAN layout overview |
| Plan 17 | Control House FOUNDATION PLAN ₂ |
| Plan 18 | Control House layout SH 001 |
| Plan 19 | Control House layout SH 002 |
| Plan 20 | Control House layout SH 003 |
| Plan 21 | Control House Plan_Interior layout |
| Plan 22 | Control House Plans_Parkline |

Plan 23	Control House-FOUNDATION DETAILS ₁
Plan 24	Control House-FOUNDATION DETAILS ₂
Plan 25	General Arrangement SH ₁
Plan 26	Control house-FOUNDATION DETAILS ₃
Plan 27	General Arrangement SH ₂
Plan 28	Transformer Firewall Foundation details
Plan 29	Transformer FOUNDATION DETAILSS
Plan 30	Typical Security Fence Details



Shukria Wiar <shukriaw@portlandmaine.gov>

14 Marginal Way Comments

Mike Tremblay <mtremblay@portlandmaine.gov>

Thu, Mar 12, 2020 at 9:01 AM

To: Shukria Wiar <shukriaw@portlandmaine.gov>

Cc: Lauren Swett <lswett@woodardcurran.com>, Robert Thompson <rmt@portlandmaine.gov>

Shukria,

- The applicant should clarify where, if anywhere, trucks will park on-site. The existing site tends to have several trucks parked on a gravel section, which should be designated as a formal parking lot with appropriate stormwater treatment elements.
- The current driveway is an acceptable width; however, the sidewalk along Marginal Way is not ADA-compliant through the driveway. The applicant should extend their work to include reconstruction of the driveway apron. Given the low-volume nature of the driveway, the sidewalk should be prioritized; the driveway should ramp up to sidewalk level using an apron, and the sidewalk should stay at a continuous elevation through the driveway.
- The applicant should work with the City's arborist, Jeff Tarling, on providing screening around the site.

That's the extent of my comments.

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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Shukria Wiar <shukriaw@portlandmaine.gov>

14 Marginal Way PL -000959-2020

Jeff Tarling <jst@portlandmaine.gov>

Fri, Feb 21, 2020 at 3:55 PM

To: Shukria Wiar <shukriaw@portlandmaine.gov>

Hi Shukria -

In review of the proposed CMP substations improvement project upgrade the tree and landscape plan, which is included on the Site Plan drawing looks good as shown. I met with the project team after the initial pre-application meeting and walked the site. The primary focus of the tree and landscape plan is to replace the existing Callery Pear trees along Forest Avenue with 'Armstrong' Red Maples, along with planting Red Pine near the corner of the substation on the Marginal Way side. The existing galvanized chain link fence will be replaced with an improved fencing material. The project use as a substation and the required safety protocols exclude some of the typical landscape treatment. The site location has been problematic with unwanted activity making views to the site more important.

Overall, the plan looks good as proposed, the only note would be that the Red Pine trees should be listed as being 6-7' (H), height vs 3.5" caliper.

Thanks,

Jeff Tarling
City Arborist - City of Portland Maine
Parks, Recreation & Facilities Department
Forestry & Horticulture
212 Canco Road - Suite A
Portland, ME. 04103
(207) 808-5400
jst@portlandmaine.gov

On Thu, Feb 20, 2020 at 2:42 PM Shukria Wiar <shukriaw@portlandmaine.gov> wrote:

[Quoted text hidden]

Planning and Urban Development Department Planning Division



Subject: B-7 Design Review – 14 Marginal Way

Written by: Caitlin Cameron, Urban Designer

Date of Review: Monday, April 12 2020

The project at 14 Marginal Way was reviewed according to the *City of Portland Design Manual* standards by Caitlin Cameron, Urban Designer and Shukria Wiar, Planner, against the *B7 Bayside Mixed Use Urban District Zone Standards* (Section (f) and Appendix 4 of the Design Manual).

Design Review Comments: *(questions and unmet standards in red)*

The review for this project is limited because the building is a small, utilitarian building to house equipment. The goal is to make it as recessive as possible and avoid safety concerns. The building is already purchased and CMP appears to be exempt from meeting the City's design standards on the basis that many of their safety standards are in conflict with the active, urban goals of the zone.

This corner is somewhat anomalous in that it is a gateway corner lot into the Bayside neighborhood, but because of the proximity of the freeway interchanges and the industrial nature of the site, the best approach is not to herald the building there but to make it recessive and safe. The proposal is completely utilitarian and the form, materials, placement, and façade design are based on CMP standards related to function and safety. This leaves little room for alteration based on urban design principles or vision for the neighborhood.

(f) B-7 Bayside Mixed Use Urban District Zone

Building relationship to the street – The building is only one story – this is short compared with the width of the streets – Forest and Marginal – however, functionally, there is no reason to build a taller building. The building is placed relatively close to the corner and includes a fence that will create a sense of street wall. The driveway and parking are away from the street and interior to the lot.

Screening and landscaping – The applicant worked with the City Arborist to discuss the appropriate placement and choices as relates to the planting plan for this corner lot. To keep sight lines and safety, minimal planting is used. A new screening fence will be provided which will give some sense of street wall while limiting access to the site.

Form – The scale and form of the building is pre-determined by the CMP standards.

Façade Design – Choices related to the window and door openings are dictated by CMP standards. The doors must face interior to the site and no additional openings are allowed for security reasons. It is for these reasons there are blank and inactive walls facing the street frontages. The fence, landscaping, and materials will provide a small level of visual interest. However, the primary goal is of function, security, and therefore, making this installation recessive should be the urban design goal.

Materials - The material choices are standard for CMP buildings of this type and are pre-fabricated. The siding is a standing seam metal with a pitched roof. The standards prohibit the use of thin-gauge metal siding and highly reflective finishes. This selection meets the standards.



Shukria Wiar <shukriaw@portlandmaine.gov>

IMPORTANT!!!! 14 Marginal Way

Lauren Swett <lswett@woodardcurran.com>
To: Shukria Wiar <shukriaw@portlandmaine.gov>

Thu, May 7, 2020 at 8:17 AM

Hi Shukria,

I've reviewed the project, and the only thing that I will note is that they need final utility ability to serve confirmation. They are just providing a small bathroom, so there is no question on capacity – they just need confirmation of their proposed utility service connections prior to starting construction.

They have provided a stormwater management plan in conformance with Maine DEP Chapter 500 and City of Portland Section 5 stormwater standards. They are providing adequate erosion and sedimentation control per the Basic Standards, they are treating the site using a grassed underdrained soil filter and the "substation yard section" which is an approved BMP for these types of projects, and they have adequately accounted for the Flooding Standard for this area with the recently constructed downstream separated stormwater system.

I have no other comments. If you have any questions, let me know!

Thanks,
Lauren

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Notice: Under Maine law, documents - including e-mails - in the possession of public officials or city employees about government business may be classified as public records. There are very few exceptions. As a result, please be advised that what is written in an e-mail could be released to the public and/or the media if requested.

CITY OF PORTLAND
Planning & Urban Development Department

Att. A

**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
Yes ☒	NA ☐	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
Yes ☒	NA ☐	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
Yes ☐	NA ☒	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)
Yes ☐	NA ☒	Public Transit (14-526 (a) 3), if applicable - Existing available transit services - Proposed site plan design details, such as easement, pad base, and shelter
Yes ☐	NA ☒	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
Yes ☐	NA ☒	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)
Yes ☒	NA ☐	Snow Storage (14-526 (a) 4 d) Management plan for snow removal and locate snow storage areas on plan
Yes ☐	NA ☒	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)

- ☒ Must be in compliance with Technical Manual, Section 13

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

Existing Conditions

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

Proposed Site Plan

- ☒ Ground floor area, and grade elevations for all buildings

Access, Circulation, and Parking

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

Site Considerations

- ☒ Identify snow storage areas
- ☐ Location of fire hydrants
- ☐ Location of solid waste management facilities

UTILITY PLAN including:

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

GRADING AND DRAINAGE PLAN including:

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

EROSION CONTROL

- ☒ Must be in compliance with Technical Manual, Section 5

LANDSCAPE PLAN including:

- ☒ Existing vegetation to be preserved and preservation measures
- ☒ Proposed landscaping and buffers
- ☒ 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

Level II Site Plan Application

for the

Forest Avenue Substation Project 14 Marginal Way Portland, Maine

Prepared for:



**Central Maine Power Company
83 Edison Drive
Augusta, Maine 04336**

Prepared by:



**Burns & McDonnell
27 Pearl Street, 2nd Floor
Portland, Maine 04101**

December 2019

Cover Letter/Project Summary



December 20, 2019

Mr. James Rather
Development Review Manager
Planning & Urban Development Department
389 Congress Street
Portland, Maine 04101

**RE: Central Maine Power Company's (CMP) Proposed Forest Avenue Substation
Expansion Project (Project); 14 Marginal Way; Chart, Block, Lot: 113 A013 001**

Dear Mr. Rather,

On behalf of CMP, Burns & McDonnell is submitting this Level II – Site Plan Application along with the supporting materials for the Project located at 14 Marginal Way.

As detailed in this application, CMP is proposing to update, redesign and expand the existing substation located at the corner of Forest Ave and Marginal Way. The upgrades will increase the reliability, stability, remote monitoring capability and operability of the associated electric transmission and distribution grid.

The proposed redesigned substation will be outfitted with new technology, infrastructure and corresponding updates that include two 34.5/12kV transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single story 32 foot x 92 foot (2,944 square foot), climate-controlled control house.

Once the new substation is built and in-service it is not anticipated to have any impact on local traffic patterns because the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and or routine maintenance.

If you have any questions regarding this application or the materials presented, please give me a call at (207) 808-4924 or email jmorin@burnsmcd.com.

Sincerely,

A handwritten signature in black ink, appearing to read "James P. Morin".

James P. Morin
Senior Environmental Scientist
Burns & McDonnell.

Enclosures

cc: Jeremy Pettengill/CMP; Jack Wu/CMP; Mark Goodwin/BMcD
File: CMP Substation Modernization



Level II Site Plan
Application Narrative

Introduction

Central Maine Power Company's (CMP) proposed Forest Avenue Substation Project (Project) at 14 Marginal Way in Portland will help modernize CMP's system by expanding the substation yard, upgrading all the electrical components, and building a new control house.

The Project described in these application materials is classified as an electrical transmission and distribution substation and is located in the City's Mixed Development District Zone (B-7). In accordance with the City of Portland Code of Ordinances, CMP seeks approval from Planning & Urban Development for the proposed expansion to the existing substation facility.

The following exhibits referenced in this application have been uploaded to the City of Portland Citizen Self Service portal as separate documents:

- Exhibit 1 – Site Plan
- Exhibit 2 – Grading Plan
- Exhibit 3 – General Arrangement and Control House Plans
- Exhibit 4 – Lighting Plans & Lighting Cut Sheets
- Exhibit 5 – Stormwater Management Study
- Exhibit 6 – Title, Rights or Interest (Deed)
- Exhibit 7 – Boundary Survey
- Exhibit 8 – Financial and Technical Capability
- Exhibit 9 – Construction Management Plan

Project Description

The subject property is located at the corner of Forest Avenue and Marginal Way in the Mixed Development District Zone (B-7). The site is 0.856 acres and currently improved with a small electrical substation within a 134 foot X 64 foot (8,576 square foot) crushed stone yard built on the eastern portion of the property.

CMP is proposing to expand the existing crushed stone yard by 10,162 square feet, for a total area of 18,738 square feet (irregular in shape). Within this expanded crushed stone yard CMP is proposing to build a new, single-story control house and replace the electrical equipment within the yard. These upgrades will increase the reliability, stability, remote monitoring capability and operability of the associated electric transmission and distribution grid.

This rebuilt substation will be outfitted with new technology, infrastructure and corresponding updates that include two new 34.5/12kV transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single story 32 foot X 92 foot (2,944 square foot), climate-controlled control house. Oil containment is provided by a graded yard draining to a catch basin which will connect to an oil containment structure. A gravel containment berm will also be installed within the yard fence. (See Exhibit 1 Site Plans) The existing brick control house will be retained for storage. A detailed list of upgraded substation components is provided below.

- Removal of existing transformer (34/12kV 12/22MVA) and associated foundation and oil containment system.
- Removal of existing 34kV and 12kV switchgear buildings and associated foundations.
- Installation of two new transformers (34/12kV 13.4/22.4 MVA w/ Load Tap Changers), and associated foundations with a site wide oil containment as described above including isolation barriers around the transformers.
- Installation of two new station service transformers providing low voltage power to the site for site lighting as well as power and lighting to the building.
- Installation of new site lighting.
- Construction of a new 2,944 square foot (32 foot X 92 foot) single story, climate-controlled control house and foundation.

The substation's crushed stone yard facility will be enclosed by a gated, double entrance, eight-foot-tall chain-link security fence painted black. Access to the substation will be from the existing 20-foot-wide by 75-foot-long asphalt pavement driveway directly off Marginal Way.

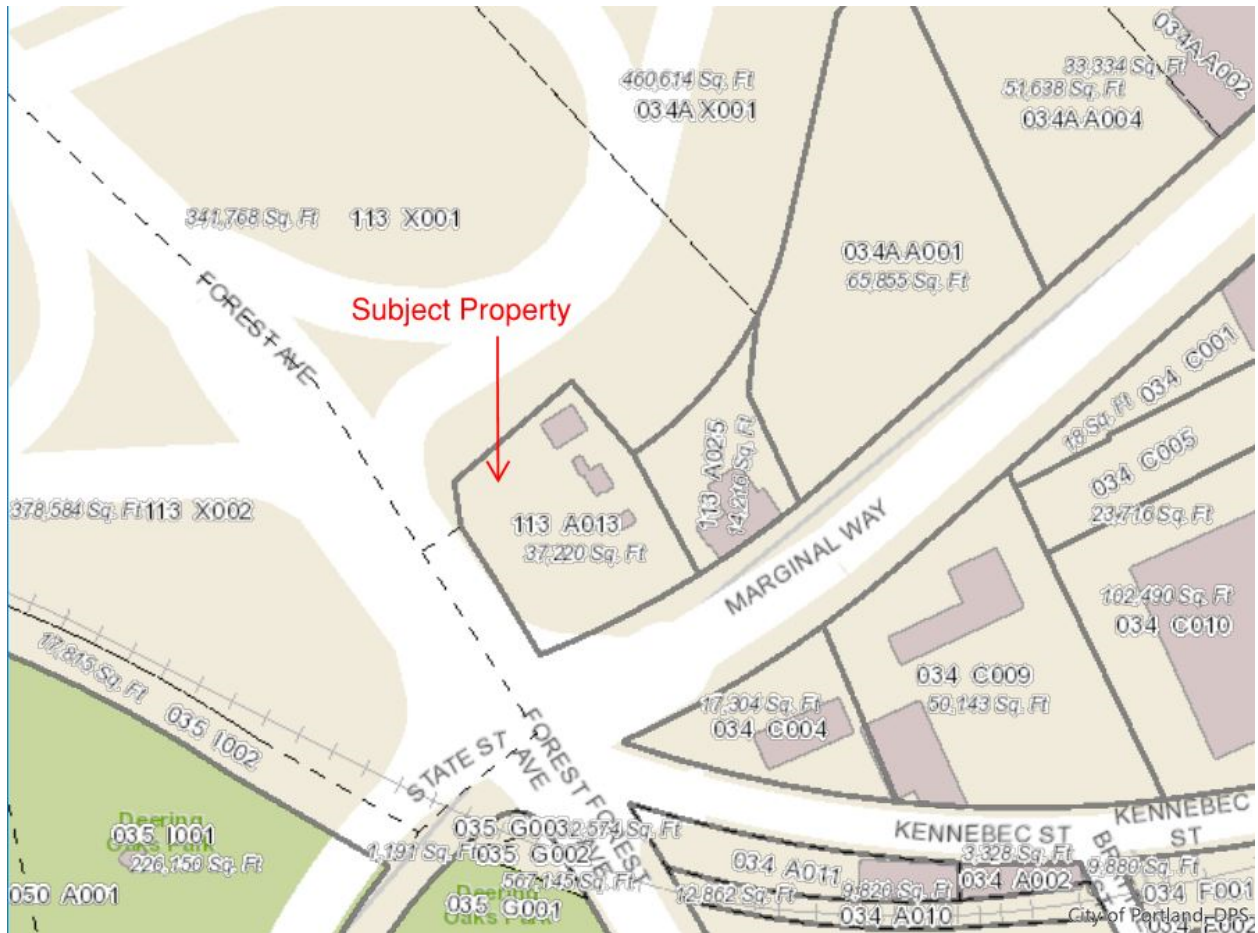
The Project will tie into the city water, storm, and sewer lines (the new control house will have a small bathroom outfitted with a toilet and wash basin), and interconnect with the transmission and distribution lines that are already underground at this location.

As part of site development, CMP will preserve the natural landscape and existing vegetation to the extent practical. The row of pine trees along the eastern boundary will remain. However, if any of the pine trees are impacted by grading, they will be replaced. There are several trees in the center of the parcel that will need to be removed to make room for the new control house. All ground disturbance and exposed soils associated with the project will be revegetated with groundcover plantings; grass. As recommended by Jeff Tarling, Portland City Arborist, CMP will remove and replace the three existing trees along the Forest Avenue frontage with Armstrong Red Maple trees. Two new additional Armstrong Red Maple trees will be planted; one in the open space at the southern corner of the property near the intersection of Marginal Way and Forest Avenue, and one in the northern corner of the property, adjacent to the bank parking lot. There is one additional tree along Marginal Way, west of the driveway, that may be impacted by grading; if so, it will all be replaced with an Armstrong Red Maple. See Site and Grading Plans for tree locations.

Once the new substation is built and in-service, it is not anticipated to have any impact on local traffic patterns because the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and routine maintenance.

Figure 1: Site Location Map

City of Portland Maine Parcel Viewer



Parcel: 113 A013

The following application narrative describes the Project's conformity with the criteria of the City of Portland, Code of Ordinances, Chapter 14 Land Use.

Article III, Division 17. B-7 Mixed Development District Zone, Section 14-294 - 14-304 Criteria

The Project is located within the City's B-7 Mixed Development District Zone. The purpose of the B-7, Mixed Development District Zone is to establish a zoning district for urban areas in which the city has adopted master plans for redevelopment. Electrical transmission and distribution substations are an allowed use under Section 14-296, Conditional Uses.

Sec. 14-296 Conditional Uses

4. "Utility substations including wastewater collection and pumping stations, water pumping stations, transfer stations, telephone electronic equipment enclosures, electrical transmission and distribution substations and similar structures larger than one-hundred (100) square feet of floor area are permitted provided the following standards are met:

- a. Notwithstanding sec. 14-298 (maximum setback) utility substations shall be setback no less than thirty-five (35) feet from the street right-of-way except in the case of a lot having frontage on Marginal Way and I-295 provided the minimum thirty-five (35) foot setback is met along Marginal Way; and
- b. The applicant demonstrates that the structure is as small in size as practicable; and
- c. The remainder of the lot not consumed by the utility substation and its related access; and shall be designed and designated for future development; and
- d. The substation equipment is fully enclosed within a structure.

As shown in the engineering plans, the Project meets these standards, however there are some electrical components that are customarily operated outdoors, such as transformers. The Project conforms to Standard 14-299(i) *Enclosure of uses: All uses shall be operated within a fully enclosed structure, except for those customarily operated in open air.*

Sec. 14-298. Dimensional Requirements:

In addition to the provisions of Article III, Division 25 of this code, lots in the B-7 mixed use urban district zone shall meet the following requirements:

<i>Minimum lot size</i>	<i>None</i>
<i>Minimum frontage</i>	<i>None</i>
<i>Front setback</i>	<i>35', as noted above</i>
<i>Rear & Side Yard</i>	<i>None</i>
<i>Maximum building lot coverage</i>	<i>One hundred percent (100%)</i>

The Project meets these Dimensional Requirements as shown in Exhibit 1, Site Plan.

The proposed substation meets the performance standards enumerated in the City of Portland's Code of Ordinance as discussed below.

Chapter 14 Land Use; Section 14-299 Performance Standards.

- a) Storage: Any storage of new materials, finished products, or related equipment must be suitably screened from the public way and from abutting properties by a solid fence at least six feet in height. All waste shall be stored in covered containers that do not leak or otherwise permit liquids or solids to escape from the container. All food processing waste shall be stored within a completely enclosed structure and if not refrigerated shall be removed from the site in an enclosed container within forty-eight (48) hours of its generation. All enclosed and exterior areas shall be cleaned and sanitized on a regular basis. Outdoor storage of refuse or debris shall be in an appropriate container or located within a designated, screened area. All dumpsters shall be screened on all four (4) sides by a minimum six (6) foot high solid fence or shall otherwise be fully enclosed as approved by the planning board or the planning and urban development department*

Not applicable; outdoor storage is not part of the substation design. The substation will be surrounded by an eight-foot chain-link security fence.

- b) Noise:*
- 3. Maximum permissible sound levels: The maximum permissible sound level of any continuous, regular or frequent source of sound produced by an activity shall be as follows:*
- a. Sixty (60) dBA between the hours of 7:00 a.m. and 10:00 p.m.*
- b. Fifty (50) dBA between the hours of 10:00 p.m. and 7:00 a.m., as measured at or within the boundaries of any residential zone.*

In addition to the sound level standards established above, all uses located within this zone shall employ best practicable sound abatement techniques to prevent tonal sounds and impulse sounds or, if such tonal and impulse sound cannot be prevented, to minimize the impact of such sounds in residential zones.

The proposed substation will have sound producing equipment, primarily the step-down transformer and the HVAC equipment. Sound levels generated by this equipment are similar to what is currently existing on site and similar to what would be expected in an urban environment. Based on design specifications provided from the transformer vender, the maximum decibel rating for the transformer shall not exceed 65 dBA as measured at the source. The design specifications for the Bard HVAC equipment state that the equipment shall not exceed 70 dBA, as measured at five feet from the source. Sound generated by the transformer and HVAC equipment would attenuate as the sound moves from the source to the

property line. Based on the location and position of the HVAC equipment and the transformers, the sounds level would be below the City's allowable limit when measured at the property line. The onsite sound emitting sources emit sound at levels detectable from the lot line that are at or below what would be expected in an urban setting such as the subject site.

- c. Vibration: Vibration inherently and recurrently generated shall be imperceptible without instruments at lot boundaries*

Not applicable; the substation will not generate any noticeable vibrations at the property boundary.

- d. Federal and state environmental regulations: All uses shall comply with federal and state environmental statutes and regulations regarding emissions into the air, except where provisions of this code are more stringent.*

Not applicable; the electrical substation will not produce any air emissions

- e. Storage of vehicles: Outdoor storage of any unregistered automotive vehicles on the premises for more than ten (10) days, and outdoor storage of any used automotive tires on the premises shall not be permitted.*

Not applicable; there will be no outdoor storage of unregistered automotive vehicles or used automotive tires at the substation.

- f. Off-street parking and loading: Off-street parking is required as provided in division 20 (off-street parking) of this article. Division 21 (off-street loading) of this article shall not apply. Surface parking shall meet the following standards:*

- 1. None of the spaces shall occupy all or a portion of a sidewalk within a street right-of-way.*
- 2. Driveway entrances shall meet the City of Portland Technical Manual standards.*
- 3. The parking area shall meet the landscape and buffer standards of the City of Portland Technical and Design Manuals.*

Once the project is complete the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and routine maintenance. During inspection and routine maintenance, all vehicle and equipment parking and loading will be in the driveway or within the fenced-in substation yard.

- g. Shoreland and flood plain management regulations: Any lot or portion of a lot located in a shoreland zone as identified on the city shoreland zoning map or in a flood hazard zone shall be subject to the requirements of division 26 and/or division 26.5.*

Not applicable; the subject property is not located in a shoreland or flood hazard zone.

- h. Glare, radiation or fumes: Glare, radiation or fumes shall not be emitted to an obnoxious or dangerous degree beyond lot boundaries.*

Not applicable; the substation will not generate or emit any glare, radiation or fumes.

- i. Enclosure of uses: All uses shall be operated within a fully enclosed structure, except for those customarily operated in open air.*

The substation facility will have a 32' x 92', single story, climate-controlled control house. There are some electrical components that will be required to be outside in open air, such as transformers.

- j. Materials or wastes: Any permitted outdoor storage of materials shall be done in such a manner as to prevent the breeding and harboring of insects or vermin, to prevent the transfer of such materials from the site by natural causes or forces and to contain fumes, dust, or other materials which constitute a fire hazard. This storage shall be accomplished within enclosed containers or by one (1) or more of the following methods: raising materials above ground, separating materials, preventing stagnant water, or by some other means. Any areas used for permitted outdoor storage of materials shall be screened from view of any adjoining properties and public rights-of-way. NO outdoor storage shall be permitted between the front of any building on the site and the street*

Not applicable; once the project is complete the substation will not generate any waste as noted above.

- k. Odor: Uses in the B-7 zone shall adhere to the odor regulations of the IL zone.*

Not applicable; the substation will not generate any industrial emitting toxic or odoriferous substances.

- l. Smoke: Discharges of smoke shall not exceed opacity percentage of forty percent (40%) or number two (2) on the ringelman chart.*

Not applicable; the substation will not generate any smoke.

- m. Discharge into sewers: No discharge shall be permitted at any point into any private sewage disposal system, or surface drain, or into the ground, of any materials in such a way or of such nature or temperature as to contaminate any water supply, or the harbor, or otherwise cause the emission of dangerous or objectionable elements, except in accordance with standards approved by the health authority or by the public works authority.*

The substation will be designed with a small bathroom (toilet and wash basin) for incidental use and be tied into public water and sewer. The Project will not generate or discharge wastewater or contaminants into any private sewers, surface drains or grounds as referenced above.

- n. Lighting: All lighting shall be designed and installed with cut-off fixtures to direct illumination onto the site and to prevent illumination from such fixtures on neighboring properties and as otherwise governed by the site lighting standards of the City of Portland Technical Manual*

Substation yard and control house lighting will be installed for security and night maintenance purposes. Several factors are considered in substation yard lighting design, including: public impact, ordinance requirements, security, safety, maintenance, light pollution, spillage, and lighting system control.

The development will include working yard lights. The working yard lights ("work lights") will only be used for infrequent maintenance or repairs that may occur during the evening hours. Adequate dusk-to-dawn lighting will be provided to access the control house (as needed), and for supporting normal operations.

Exterior control house lights will be wall-mounted, "full cut off – down luminaire," or an approved equal. One fixture will be mounted above each control house entry. Controls for wall mounted luminaires will be designed such that they may be either manually turned on and off or placed in an "auto" mode via a control switch. The "auto" position would allow CMP continuous "dusk to dawn" operation as controlled by a photo eye. The primary function of the control house mounted exterior luminaires is for maintenance (nighttime visibility to the control house for utility workers) as well as overall station and control house security and to deter vandalism.

Light poles will be placed at a minimum of five feet inside of the perimeter fence for security reasons. The controls for the perimeter luminaires will be designed such that they may be manually turned on and off or placed in an "auto" mode via a control switch. The "auto" position would allow continuous "dusk to dawn" operation, as controlled by a photo eye. The normal operation would be to place the perimeter lights in an "off" position which would not allow them to operate automatically. Certain operational or security requirements may warrant operating these lights in the "auto" mode.

Outdoor "work lights" will be installed on appropriate structures as required throughout the substation yard for maintenance and operation purposes. These flood type luminaires will be directed to areas common for maintenance and switching but operated so as not to contribute to light pollution. The luminaires will be installed at a tilt determined by the lighting design such that the aiming point is directed to high voltage equipment at the standard equipment heights. The work light controls will be designed such that they may be manually turned on and off only,

with no “auto” mode, as the intended use is for occasional and specific nighttime use only and not for security or general lighting.

All exterior lighting will be designed and shielded to avoid undue adverse impact on neighboring properties. See Exhibit 4 for more information on the Lighting Plan.

- o. Building entrances: All buildings shall have a minimum of one (1) public pedestrian entrance facing the street frontage of the lot. Such building entrances shall also be reviewed under the B-7 bayside design standards*

Not applicable; the substation is not designed for public access.

Chapter 14 Land Use; Section 14-526: Site Plan Standards.
Level II (and Level III) Site Plan Standards and Submission Checklist

Transportation Standards

Transportation Analysis – Traffic Impact (14-526 (a)1)

No applicable; once the Project is complete, the substation will not have any impact on local traffic patterns because the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and or routine maintenance.

Access and Circulation (14-526 (a) 2a)

Pre-existing conditions remain; access to the substation is from the existing 20' wide by 75' long asphalt pavement driveway off Marginal Way.

Loading and Servicing (14-526 (a) 2 b)

Not applicable; once the project is complete the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and or routine maintenance.

Sidewalks (14-526 (a) 2 c)

Not applicable. There will be no pedestrian access associated with this site. The existing sidewalks associated with Marginal Way will remain open and accessible during and post construction.

Public Transit (14-526 (a) 3), if applicable

Not applicable. There is no public access associated with the project.

Off-Street Parking: Vehicle & Motorcycle/Scooter (14-526 (a) 4 a and c)

Not applicable, there will be no public access or public parking associated with the Project. All parking for the substation will be in association with routine inspection and maintenance activities and in the driveway or within the fenced in yard.

Bicycle Parking (14-526 (a) 4 b)

Not applicable; there is no bicycle parking associated with the project.

Snow Storage (14-526 (a) 4 d)

Snow storage will be on site along the private driveway and within the confines of the fenced-in yard.

Traffic Demand Management (TDM) (14-526 (a) 5), if applicable

No applicable; once the project is complete, the substation will be like before, it will not have any impact on local traffic patterns because the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and routine maintenance.

Environmental and Landscape Features

Preservation of Significant Natural Features (14-526 (b) 1), if applicable

Not applicable; there are no significant natural features, endangered plants, trees, or unique habitats or waterbodies on or associated with the property.

Landscaping and Landscape Preservation (14-526 (b) 2 a)

As part of site development, CMP will preserve the natural landscape and existing vegetation to the extent practical. The row of pine trees along the eastern boundary are outside the Project's limit of disturbance (LOD) and will remain. However, if any of these pine trees are impacted by grading, they will be replaced. There are several trees in the center of the parcel that will need to be removed to make room for the new control house. All ground disturbance and exposed soils associated with the project will be revegetated with groundcover plantings; grass. As recommended by Jeff Tarling, Portland City Arborist, CMP will replace the three existing trees along the Forest Avenue frontage with Armstrong Red Maple trees. Two new additional Armstrong Red Maple trees will be planted; one in the open space at the southern corner of the property near the intersection of Marginal Way and Forest Avenue, and one in the northern corner of the property, adjacent to the bank parking lot. There is one additional tree adjacent to Marginal Way that may be impacted by grading; if so, it will be replaced with an Armstrong Red Maple. Due to the small amount of landscaping required by the City of Portland for this project, no separate landscaping plan has been prepared. See Site and Grading Plans for new tree locations and details.

Site Landscaping (14-526 (b) 2 b)

As noted above, the row of pine trees along the eastern boundary will remain. However, if any are impacted by grading, they will be replaced with similar type pine trees. All disturbed or exposed soils associated with the project will be revegetated with grass. Per the recommendation of Jeff Tarling, City Arborist, CMP will replace the three existing trees on CMP's property that are directly adjacent to Forest Avenue with Armstrong Red Maple. Two new additional Armstrong Red Maple will be planted; one in the open space at the southern corner of the property near the intersection of Marginal Way and Forest Avenue, and one in the northern corner of the property, adjacent to the bank parking lot. There is one additional tree adjacent to Marginal Way that may be

impacted by grading; if so, it will be replaced with an Armstrong Red Maple to match the others.

Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable

Not applicable; there is no public parking lot associated with the project.

Street Trees (14-526 (b) 2 b iii)

There are no Heritage Trees abutting or adjacent to the project. Trees directly adjacent to Forest Avenue will be replaced with Armstrong Red Maple. See Exhibit 1 and 2; Site and Grading Plans vegetation associated with the project.

Environmental and Stormwater

Water Quality, Stormwater Management and Erosion Control (14-526 (b)3 a)

The Stormwater Management Study (SMS) for the Project describes the stormwater controls and Best Management Practices (BMP) that will be applied during construction. Erosion control techniques will also be consistent with Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (CMP 2018), which is an appendix to the SMS.

As noted in the SMS, post development stormwater drainage patterns will mimic pre-development conditions. To treat and control stormwater runoff the Project's yard section is considered a BMP as approved by the Maine DEP. The majority of stormwater from the exterior of the substation will be intercepted by a grassed, underdrained soil filter. Overflow from these BMP's will drain to a proposed storm drain line with ultimate discharge to the City's storm drain system along the western side of the property. This underdrained soil filter will be vegetated to blend in with the surrounding environment. See Exhibit 5 for more information on Stormwater Management.

Public Infrastructure and Safety

Consistency with City Master Plans (14-526 (c) 1)

The use is consistent with the City Council approved master plans. The site is currently improved with an electrical substation and a paved driveway. After the project is complete the site will still be improved with an electrical substation, albeit larger, and a paved driveway.

Public Safety and Fire Prevention (14-526 (c))

The substation will be enclosed by a double entrance, eight-foot-tall chain-link security fence around the entire perimeter. The control house and electrical components will be outfitted with smoke and heat detectors and will be remotely monitored by CMP. CMP

will work with first responders to provide access to the substation during emergency situations.

Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)

The substation facility will be designed with a new single-story, climate-controlled control house outfitted with a small bathroom that will have sporadic and infrequent use. The control house will be connected to City water and sewer in accordance with the provisions outlined in Section 2 and Section 9 of the Technical Manual.

Site Design

Massing, Ventilations and Wind Impact (14-526 (d) 1)

Not applicable; the project's single-story climate-controlled control house and associated HVAC equipment will not have any massing, ventilation and wind impacts on adjacent structures, adjoining properties, or open public spaces. See Exhibit 3 for the General Arrangement.

Shadows (14-526 (d) 2), if applicable

Not applicable in the B7 development zone district. In addition, the project is not anticipated to have any "shadow" impact on publicly accessible open spaces.

Snow and Ice Loading (14-526 (d) 3)

Not applicable; the project is not anticipated to pose a risk of snow and ice from loading or falling onto adjacent properties or public ways.

View Corridors (14-526 (d) 4), if applicable

Not applicable; the site is already improved with an existing substation. The project does not change the use of the site, or the viewshed of the surrounding properties.

Historic Resources (14-526 (d) 5), if applicable

Not applicable; the site is already improved with an existing substation. The project does not change the use of the site or impose undo impacts on surrounding properties that do not already exist.

Exterior Lighting (14-526 (d) 6)

Substation yard and control house lighting will be installed for security and night maintenance purposes. Several factors are considered in substation yard lighting design,

including: public impact, ordinance requirements, security, safety, maintenance, light pollution, spillage, and lighting system control.

The development will include working yard lights. The working yard lights ("work lights") will only be used for infrequent maintenance or repairs that may occur during the evening hours. Adequate dusk-to-dawn lighting will be provided to access the control house (as needed), and for supporting normal operations.

Exterior control house lights shall be wall-mounted, "full cut off – down luminaire," or an approved equal. One fixture will be mounted above each control house entry. Controls for wall mounted luminaires will be designed such that they may be either manually turned on and off or placed in an "auto" mode via a control switch. The "auto" position would allow CMP continuous "dusk to dawn" operation as controlled by a photo eye. The primary function of the control house mounted exterior luminaires is for maintenance (nighttime visibility to the control house for utility workers) as well as overall station and control house security and to deter vandalism.

Light poles will be placed at a minimum of five feet inside of the perimeter fence for security reasons. The controls for the perimeter luminaires will be designed such that they may be manually turned on and off or placed in an "auto" mode via a control switch. The "auto" position would allow continuous "dusk to dawn" operation, as controlled by a photo eye. The normal operation would be to place the perimeter lights in an "off" position which would not allow them to operate automatically. Certain operational or security requirements may warrant operating these lights in the "auto" mode.

Outdoor "work lights" will be installed on appropriate structures as required throughout the substation yard for maintenance and operation purposes. These flood type luminaires will be directed to areas common for maintenance and switching but operated so as not to contribute to light pollution. The luminaires will be installed at a tilt determined by the lighting design such that the aiming point is directed to high voltage equipment at the standard equipment heights. The work light controls will be designed such that they may be manually turned on and off only, with no "auto" mode, as the intended use is for occasional and specific nighttime use only and not for security or general lighting.

All exterior lighting will be designed and shielded to avoid undue adverse impact on neighboring properties. See Exhibit 4 for more information on the Lighting Plan.

Noise and Vibration (14-526 (d) 7)

The proposed substation will have sound producing equipment, primarily the step-down transformer and the HVAC equipment. Sound levels generated by this equipment are similar to what would be expected in an urban environment. Based on design

specifications provided from the transformer vendor, the maximum decibel rating for the transformer shall not exceed 65 dBA as measured at the source. The design specifications for the Bard HVAC equipment state that the equipment shall not exceed 70 dBA, as measured at five feet from the source. Sound generated by the transformer and HVAC equipment would attenuate as the sound moves from the source to the property line. The sound emitting sources onsite emit sound at levels that are below the town's allowable property line limit when measured next to the respective source. Therefore, there are no expected exceedances of the noise limit provided in Section 14-299(b), due to operation of the substation.

Vibrations associated with the substation's electrical components will be minimal and not noticeable beyond the perimeter fencing and will have no discernible effect on the surrounding properties.

Signage and Wayfinding (14-526 (d) 8), if applicable

There will be no permanent, free standing signs associated with the substation. There will be a small sign attached to the substation perimeter fence showing the street address, CMP and emergency contact information, and stating private property, no trespassing, and safety as standard at all CMP substations.

Zone Related Design Standards (14-526 (d) 5)

The substation's single-story climate-controlled control house is a pre-fabricated, metal structure assembled on site on a concrete foundation. See the General Arrangement and the Control House Plans in Exhibit 3 for additional information on the control house and other electrical components of the substation.

Construction Management Plan

Construction Management Plan

A Construction Management Plan has been prepared by CMP. See Exhibit 9 for the Construction Management Plan.

EXHIBIT 1

Site Plan

EXHIBIT 2

Grading Plan

EXHIBIT 3

General Arrangement and Control House Plans

EXHIBIT 4

Lighting Plans & Cut Sheets

EXHIBIT 5

Stormwater Management Study

EXHIBIT 6

Proof of Title, Right or Interest (Deed)

EXHIBIT 7
Boundary Survey

EXHIBIT 8

Financial and Technical Capability

EXHIBIT 9

Construction Management Plan



CREATE AMAZING.

December 20, 2019

Mr. James Rather
Development Review Manager
Planning & Urban Development Department
389 Congress Street
Portland, Maine 04101

**RE: Central Maine Power Company's (CMP) Proposed Forest Avenue Substation
Expansion Project (Project); 14 Marginal Way; Chart, Block, Lot: 113 A013 001**

Dear Mr. Rather,

On behalf of CMP, Burns & McDonnell is submitting this Level II – Site Plan Application along with the supporting materials for the Project located at 14 Marginal Way.

As detailed in this application, CMP is proposing to update, redesign and expand the existing substation located at the corner of Forest Ave and Marginal Way. The upgrades will increase the reliability, stability, remote monitoring capability and operability of the associated electric transmission and distribution grid.

The proposed redesigned substation will be outfitted with new technology, infrastructure and corresponding updates that include two 34.5/12kV transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single story 32 foot x 92 foot (2,944 square foot), climate-controlled control house.

Once the new substation is built and in-service it is not anticipated to have any impact on local traffic patterns because the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and or routine maintenance.

If you have any questions regarding this application or the materials presented, please give me a call at (207) 808-4924 or email jmorin@burnsmcd.com.

Sincerely,



James P. Morin
Senior Environmental Scientist
Burns & McDonnell.

Enclosures

cc: Jeremy Pettengill/CMP; Jack Wu/CMP; Mark Goodwin/BMcD
File: CMP Substation Modernization



March 25, 2020

Shukria Wiar, City Planner
City of Portland
389 Congress Street, 4th Floor
Portland, Maine 04101

RE: Response to the March 13th email with staff review comments on materials submitted for Central Maine Power Company (CMP) Forest Avenue Substation Level II Site Plan Application.

Dear Ms. Wiar:

On behalf of Central Maine Power Company (CMP), Burns and McDonnell is pleased to provide this response to your March 13th email that contained City staff comments on material submitted for CMP's Forest Avenue Substation Level II Site Plan Application. The email contained comments from the Planning Division, the City Arborist and the Department of Public works; each of which are addressed below.

Planning Division Comments:

Utility stations are permitted in the B-7 zone as a conditional use; all conditional uses are reviewed by the Planning Board. After further review of the zoning, staff has determined that the application will need to be reviewed and approved by the Planning Board based on the section below:

Sec. 14-296. Conditional uses. (a) The following uses shall be permitted as conditional uses in the B-7 zone as provided in section 14-474 (conditional uses), provided that, notwithstanding 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:

4. Utility substations including wastewater collection and pumping stations, water pumping stations, transfer stations, telephone electronic equipment enclosures, electrical transmission and distribution substations and similar structures larger than one hundred (100) square feet of floor area are permitted provided the following standards are met:

- a. Notwithstanding sec. 14-298 (maximum setback) utility substations shall be setback no less than thirty-five (35) feet from the street right-of-way except in the case of a lot having frontage on Marginal Way and I-295 provided the minimum thirty-five (35) foot setback is met along Marginal Way; and

CMP Response:

All foundations for the substation improvements are outside the thirty-five (35) foot setback along Marginal Way. The Site Plan has been updated to show the thirty-five (35) foot setback along Marginal Way and Forest Avenue. This revised Site Plan has been uploaded to the Portland Citizen Self Service Portal.



- b. The applicant demonstrates that the structure is as small in size as practicable; and

CMP Response:

Based on CMP substation modernization requirements and the infrastructure needed to meet future energy needs for the serviceable area, the substation yard and associated components (two transformer configuration, four separate gas insulated switchgear (GIS) lineups, associated protection and control equipment and battery system) have been designed to be “as small in size as practicable”.

- c. The remainder of the lot not consumed by the utility substation and its related access; and shall be designed and designated for future development; and

CMP Response:

The subject property located at 14 Marginal Way is wholly owned by CMP. As stated in the Level II Site Plan Narrative, the project includes expanding the substation yard and installing new technology, infrastructure and corresponding updates that include two new transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single-story, climate-controlled control house. In by doing this CMP has developed the majority of the site, and any future development will be within the confines of the newly expanded fenced in area.

- d. The substation equipment is fully enclosed within a structure.

CMP Response:

As noted in the Level II Site Plan Narrative, the substation plans call for a single-story climate-controlled control house, which will contain the switchgear, station service batteries and other protection, control and communication equipment. However, there are some electrical components that are customarily operated outdoors, such as transformers. The transformers will be surrounded by a three-sided, 16-foot 8-inch-tall firewall made of concrete material. This is shown on the Transformer Firewall Foundation Details, which was uploaded to the Citizen Self Service Portal.

Additionally, as noted on page 8 of the Level II Site Plan Narrative, the Project conforms to Standard 14-299(i) Enclosure of uses: All uses shall be operated within a fully enclosed structure, except for those customarily operated in open air.

**City Arborist Comments:**

In review of the proposed CMP substations improvement project upgrade the tree and landscape plan, which is included on the Site Plan drawing looks good as shown. I met with the project team after the initial pre-application meeting and walked the site. The primary focus of the tree and landscape plan is to replace the existing Callery Pear trees along Forest Avenue with 'Armstrong' Red Maples, along with planting Red Pine near the corner of the substation on the Marginal Way side. The existing galvanized chain link fence will be replaced with an improved fencing material. The project use as a substation and the required safety protocols exclude some of the typical landscape treatment. The site location has been problematic with unwanted activity making views to the site more important.

Overall, the plan looks good as proposed, the only note would be that the Red Pine trees should be listed as being 6-7' (H), height vs 3.5" caliper.

CMP Response:

The size of the Red Pine listed in the Landscape Plant Schedule on the Site Plan has been changed from 3.5" caliper to 6-7' height. The revised Site Plan has been uploaded to the Citizen Self Service Portal.

Department of Public Works:

1. The applicant should clarify where, if anywhere, trucks will park on-site. The existing site tends to have several trucks parked on a gravel section, which should be designated as a formal parking lot with appropriate stormwater treatment elements.

CMP Response:

As noted on page 10 of the Level II Site Plan Narrative, "Once the project is complete the facility will be unmanned. Visits to the facility will be infrequent and mainly for inspection and routine maintenance. During inspection and routine maintenance, all vehicle and equipment parking and loading will be in the driveway or within the fenced-in substation yard."

As an additional note, the only vehicles that will be parked on site will be for inspection and routine maintenance. The trucks that have been parking on the site will no longer be doing so, as the site development will not allow this to continue.

Department of Public Works:

2. The current driveway is an acceptable width; however, the sidewalk along Marginal Way is not ADA-compliant through the driveway. The applicant should extend their work to include reconstruction of the driveway apron. Given the low-volume nature of the driveway, the sidewalk should be prioritized; the driveway should ramp up to sidewalk level using an apron, and the sidewalk should stay at a continuous elevation through the driveway.

CMP Response:

CMP's substation modernization plan includes expanding the substation yard, building a new control house, installing new transformers and upgrading all the associated electrical components, among other improvements. The project does not include making any alterations to the driveway within the City ROW. (See the Site Plan, Site Utility Plan and the Grading and Drainage Plan)

The Americans with Disabilities Act (ADA) defines "Alterations" as (a) General. (1) Any alteration to a place of public accommodation or a commercial facility, after January 26, 1992, shall be made so as to ensure that, to the maximum extent feasible, the altered portions of the facility are readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. (b) Alteration. For the purposes of this part, an alteration is a change to a place of public accommodation or a commercial facility that affects or could affect the usability of the building or facility or any part thereof. ([See Section 36.402 Alterations](#)¹)

Additionally, the ADA specifically has exemptions for electrical substations, as referenced in [Chapter 2: Scoping Requirements](#)², 203.5 Machinery Spaces. Spaces frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment shall not be required to comply with these requirements or to be on an accessible route. Machinery spaces include, but are not limited to, elevator pits or elevator penthouses; mechanical, electrical or communications equipment rooms; piping or equipment catwalks; water or sewage treatment pump rooms and stations; electric substations and transformer vaults; and highway and tunnel utility facilities.

Since CMP is not altering the existing driveway, or altering a facility that is "readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs" the need to go forward with the City's request to have a new ADA compliant driveway apron is not necessary.

Department of Public Works:

3. The applicant should work with the City's arborist, Jeff Tarling, on providing screening around the site.

CMP Response:

CMP meet with Jeff Tarling/City Arborist on 10/10/2019. At that time, it was decided that no screening would be installed around the perimeter of the site due to safety reasons and

¹ <https://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm#36402>

² <https://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm#c2>



from a security standpoint. An email to support this perspective is included as an attachment to this letter.

Additionally, as noted on pages 6 and 15 of the Level II Site Plan Narrative, CMP received landscape options from Jeff Tarling/City Arborist; referenced below.

“As recommended by Jeff Tarling, Portland City Arborist, CMP will remove and replace the three existing trees along the Forest Avenue frontage with Armstrong Red Maple trees. Two new additional Armstrong Red Maple trees will be planted; one in the open space at the southern corner of the property near the intersection of Marginal Way and Forest Avenue, and one in the northern corner of the property, adjacent to the bank parking lot. There is one additional tree along Marginal Way, west of the driveway, that may be impacted by grading; if so, it will all be replaced with an Armstrong Red Maple. See Site and Grading Plans for tree locations”. (page 6 of the Level II Site Plan Narrative)

This letter serves as CMP’s response to the email addressing staff reviewer comments.

The revised engineering drawing and or plans described above have been uploaded to the City of Portland Citizen Self Service Portal.

If you have any questions regarding these responses please call me at (207) 808-4924, or email jmorin@burnsmcd.com.

Sincerely,

A handwritten signature in black ink, appearing to read "James P. Morin".

James P. Morin
Senior Environmental Specialist
Burns & McDonnell

Enclosures

cc: Darrel Speed/CMP, Jeremy Pettengill/CMP, Jack Wu/CMP

File: CMP Substation Modernization/Forest Avenue



Morin, James

From: Jeff Tarling <jst@portlandmaine.gov>
Sent: Thursday, October 24, 2019 11:27 AM
To: Morin, James
Cc: WU, EN; PETTENGILL, JEREMY; James Rather
Subject: Re: Forest Ave Site Visit

Hi James -

The reply memo covers the details of our site visit last week at the Forest Avenue sub-station. Fencing wise, would you recommend the typical 6 gauge vinyl fence with coating vs the black painted galvanized chain-link? Tree tree replacement removes the existing Callery Pear trees that have a shorter life expectancy with 'Armstrong' Red Maples. Unfortunately, due to the unwanted, challenging, human activities present in this area, additional shrub planting would be problematic from a safety / security standpoint. We would see the concept plan in our Site Plan Review meeting and discuss with other City staff members.

Thanks,

Jeff

Fence information:

<http://www.mainlinefence.com/commercial/chain-link-fags>

Jeff Tarling
City Arborist - City of Portland Maine
Parks, Recreation & Facilities Department
Forestry & Horticulture
212 Canco Road
Portland, ME. 04103
(207) 808-5446
jst@portlandmaine.gov

On Mon, Oct 14, 2019 at 11:05 AM Morin, James <jmorin@burnsmcd.com> wrote:

Jeff,

Thank you for talking with us last Thursday about the city's preferences regarding the security fencing and landscaping at CMP's proposed Forest Ave. Substation modernization project.

Based on our conversation, CMP will incorporate a perimeter security fence around the substation that would tie into the fencing associated with the highway on-ramp. The newly installed security fence will be similar to the one at the Highland Ave Substation in South Portland. However, upon recent inspection, the Highland Ave. Substation security fencing is actually a galvanized fence that is painted black. Please confirm this would be acceptable for the new Forest Ave. Substation security fencing.

Additionally, based on your recommendation, CMP will remove and replace the three trees on CMP's property along Forest Ave. with Armstrong Red Maple, as well as planting one Armstrong Red Maple in the open space at the corner of Forest Ave and Marginal Way and one in the open space at the northern corner of the site, behind the adjacent bank parking lot. (See attached Google Earth Map).

These site design components will be reflected on the final Site Plans submitted as part of the official permitting documents. Due to the small amount of landscaping required, no separate landscape plan will be prepared.

Please let me know if there are other considerations the City would require for this substation modernization project as part of the permitting standards with regard to landscaping and security fencing.

Thanks,

Jim

James P. Morin, LF*, CPESC \ Burns & McDonnell

Sr. Environmental Scientist \ Forester LF3318

Office 207-808-4924 \ **Mobile** 207-229-6752

jmorin@burnsmcd.com \ burnsmcd.com

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April 10, 2020

Shukria Wiar, City Planner
City of Portland
389 Congress Street, 4th Floor
Portland, Maine 04101

RE: Response to your April 7th email with Ms. Cameron's review comments on materials submitted for Central Maine Power Company (CMP) Forest Avenue Substation Level II Site Plan Application.

Dear Ms. Wiar:

On behalf of Central Maine Power Company (CMP), Burns and McDonnell is pleased to provide this response to your April 7th email that contained comments from Ms. Caitlin Cameron/Urban Designer on materials and information submitted for CMP's Forest Avenue Substation Level II Site Plan Application. The comments from Ms. Cameron are addressed below.

Comment #1:

The building is placed near the street with landscape and fence screening. This corner is a gateway and is a transition from the wide and busy Forest Avenue and Deering Oaks to the Bayside neighborhood. A heavily landscaped edge that downplays the industrial structure is appropriate.

CMP Response:

CMP meet with Jeff Tarling/City Arborist on 10/10/2019. At that time, it was decided that no screening would be installed around the perimeter of the site due to safety reasons and from a security standpoint. An email to support this perspective is included as an attachment to this letter.

Additionally, as noted on pages 6 and 15 of the Level II Site Plan Narrative, CMP received landscape options from Jeff Tarling/City Arborist; referenced below.

"As recommended by Jeff Tarling, Portland City Arborist, CMP will remove and replace the three existing trees along the Forest Avenue frontage with Armstrong Red Maple trees. Two new additional Armstrong Red Maple trees will be planted; one in the open space at the southern corner of the property near the intersection of Marginal Way and Forest Avenue, and one in the northern corner of the property, adjacent to the bank parking lot. There is one additional tree along Marginal Way, west of the driveway, that may be impacted by grading; if so, it will all be replaced with an Armstrong Red Maple. See Site and Grading Plans for tree locations". (page 6 of the Level II Site Plan Narrative)



Additionally, in the March 13th email from Shukria Wiar that contained city staff comments, the City Arborist Comments included:

“In review of the proposed CMP substations improvement project upgrade the tree and landscape plan, which is included on the Site Plan drawing looks good as shown. I met with the project team after the initial pre-application meeting and walked the site. The primary focus of the tree and landscape plan is to replace the existing Callery Pear trees along Forest Avenue with 'Armstrong' Red Maples, along with planting Red Pine near the corner of the substation on the Marginal Way side. The existing galvanized chain link fence will be replaced with an improved fencing material. The project use as a substation and the required safety protocols exclude some of the typical landscape treatment. The site location has been problematic with unwanted activity making views to the site more important. Overall, the plan looks good as proposed, the only note would be that the Red Pine trees should be listed as being 6-7' (H), height vs 3.5" caliper.

CMP addressed this comment by revising the Site Plan to show the Red Pine as being 6-7' (H) vs 3.5" caliper and uploaded the revised plan to the City's Electronic Plan Review Portal.

Comment #2

However, the materials on the buildings requires some clarification and must be labeled on the elevations:

- a. - are the three-sided enclosures brick or concrete masonry? What is the finish?

CMP Response:

The three-sided enclosures are built using CMUs (Concrete Masonry Units) and will have a bare, concrete finish. The main purposes of the three-sided enclosures are for fire protection and to act as a sound buffer.

- b. This zone does not allow thin-gauge metal siding - more information about the metal siding is needed. Is this corrugated or standing seam? What is the finish? Overly reflective material would not be considered appropriate.

CMP Response

The building walls are standing seam construction, made of 0.028" thick, ASTM A 653, G90, SQ 50 Grade 1 material. The wall finish is a Desert Tan and the roof color is Arctic White. The picture below is an example of a completed control house. This color, style and design is standard for all CMP electrical substation control houses, and what has been purchased for this project.



- c. Why was the pitched roof chosen?

CMP Response

The roof pitch is standard CMP design required for all new control house installations, and what has been purchased for this project.

- d. Will the building wall facing Forest Avenue be a blank wall?

CMP Response

Other than an exhaust fan, the wall facing Forest Avenue will be blank. For safety and security reasons, electrical substations do not have any windows. Per CMP standards, all doors face into the substation yard. The images below represent the orientation, layout and general arrangement for the substation. All substation and control house plans have been uploaded to the City's Electronic Plan Review portal.



This letter serves as CMP's response to the April 7th email addressing Ms. Cameron's comments.

If you have any questions regarding these responses please call me at (207) 229-6752, or email jmorin@burnsmcd.com.

Sincerely,

A handwritten signature in black ink, appearing to read "James P. Morin".

James P. Morin
Senior Environmental Specialist
Burns & McDonnell

Enclosures

cc: Darrel Speed/CMP, Jeremy Pettengill/CMP, Jack Wu/CMP

File: CMP Substation Modernization/Forest Avenue



Morin, James

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Thanks,

Jeff

Fence information:

<http://www.mainlinefence.com/commercial/chain-link-fags>

Jeff Tarling
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Forestry & Horticulture
212 Canco Road
Portland, ME. 04103
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jst@portlandmaine.gov

On Mon, Oct 14, 2019 at 11:05 AM Morin, James <jmorin@burnsmcd.com> wrote:

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Additionally, based on your recommendation, CMP will remove and replace the three trees on CMP's property along Forest Ave. with Armstrong Red Maple, as well as planting one Armstrong Red Maple in the open space at the corner of Forest Ave and Marginal Way and one in the open space at the northern corner of the site, behind the adjacent bank parking lot. (See attached Google Earth Map).

These site design components will be reflected on the final Site Plans submitted as part of the official permitting documents. Due to the small amount of landscaping required, no separate landscape plan will be prepared.

Please let me know if there are other considerations the City would require for this substation modernization project as part of the permitting standards with regard to landscaping and security fencing.

Thanks,

Jim

James P. Morin, LF*, CPESC \ Burns & McDonnell

Sr. Environmental Scientist \ Forester LF3318

Office 207-808-4924 \ **Mobile** 207-229-6752

jmorin@burnsmcd.com \ burnsmcd.com

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ZONING ANALYSIS Relevant Zone(s) B-7; Mixed Development

All Projects:

	Required	Proposed
Lot Size	None	0.856 ac
Area Per Dwelling Unit	NA	NA
Minimum Street Frontage	None	
Front Yard Minimum	35'	
Front Yard Maximum	None	
Rear Yard	None	
Yard Right	None	
Yard Left	None	
Side Street Setback	None	
Step Back	None	
Maximum Lot Coverage	100%	
Minimum Lot Coverage		
Maximum Height	125'	22'
Open Space		
Maximum Impervious Area		21,881 sq. ft.
Pavement Setback		
Floor Area Ratio		
Off Street Parking Spaces		gravel yard
Loading Bays		NA
Other 1		
Other 2		
Other 3		

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		

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):			



MAINE

Department of the Secretary of State
Bureau of Corporations, Elections and Commissions

Corporate Name Search

Information Summary

[Subscriber activity report](#)

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CENTRAL MAINE POWER COMPANY	19050014 D	BUSINESS CORPORATION	GOOD STANDING

Filing Date	Expiration Date	Jurisdiction
07/20/1905	N/A	MAINE

Other Names (A=Assumed ; F=Former)

MAINEPOWER - CANCELLED	A
MAINE POWER, INC.-CANCELLED	A
COMBINED ENERGIES - CANCELLED	A
THE MESSALONSKEE ELECTRIC COMPANY	F

Clerk/Registered Agent

JUSTIN P. ATKINS
ONE CITY CENTER, 5TH FLOOR
PORTLAND, ME 04101

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Central Maine Power Company (CMP) Technical Capabilities

CMP is a subsidiary of AVANGRID Networks, a diversified international energy and utility company with \$31 billion in assets and operations in 23 states. CMP was founded in 1899 and is Maine's largest transmission and distribution utility serving over 615,000 customers in southern, western, and central Maine. CMP is responsible for operating and maintaining the transmission and distribution system throughout its service territory, including functions like service connections, outage restoration, and system improvements and upgrades as required, delivering more than 9 billion kilowatt hours of electricity yearly to retail electric customers. This service territory contains about 78 percent of Maine's population and the major commercial, manufacturing, and residential area of the State.

CMP's delivery system comprise of 2,536 miles of overhead transmission line, 23,463 pole-miles of distribution line, 155 miles of underground or submarine cable, and 254 substations. CMP has constructed over 500 miles of new transmission facilities in the previous 10 years. CMP has high-voltage connections with other electric systems at the New Hampshire and New Brunswick borders. Peak power demand on the CMP system reached 1,682 megawatts. The utility employs an estimated 1,200 people.

Forest Avenue Substation Construction Management Plan

Project Description

Central Maine Power (CMP), a subsidiary of AVANGRID Networks, Inc., will be expanding the existing Forest Avenue Substation, located at the corner of Forest Avenue and Marginal Way in Portland. The proposed expansion will help modernize CMP's system and improve electrical transmission and distribution needs in the area. The rebuilt substation will be outfitted with new technology, infrastructure and corresponding updates that include two new 34.5/12 kV transformers on concrete foundations, two new station service transformers on concrete foundations, new site lighting, and a new single story 32 foot by 92 foot (2,944 square foot), climate controlled control house. Oil containment is provided by a graded yard draining to a catch basin which will connect to an oil containment structure. A gravel containment berm will also be installed within the yard fence. The existing brick control house will be retained for storage.

The substation's crushed stone yard facility will be enclosed by a gated, double entrance, eight-foot-tall chain-link security fence painted black. Access to the substation will be from the existing 20-foot-wide by 7-foot-long asphalt pavement driveway directly off Marginal Way.

In accordance with the City of Portland's Level II Site Plan Review, the following Construction Management Plan will be referenced by the general contractor during construction.

A. Construction Management Principles

CMP and its general contractor understands the importance of minimizing impacts from construction, such as noise, vibration, ground movement, traffic, public safety, and other construction related factors to adjacent businesses and communities. CMP and its general contractor will obtain all pertinent permits prior to commencement of work. Construction activities performed by the general contractor will be in accordance and comply with the City's ordinances addressing construction hours, noise, traffic, public safety, erosion and stormwater management. Additionally, the general contractor will perform Best Management Practices (BMPs) and adhere to the erosion control techniques consistent with CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (CMP 2018).

B. Development Review of Construction Management Plan

Prior to construction commencement, CMP and its general contractor will develop a comprehensive logistics and safety program for construction and submit to the City for review and comment. CMP and its general contractor will address and resolve any issues or concerns from the City prior to construction commencement.

C. Performance Guarantees, Inspection Fees, Preconstruction Meeting and Permits

Performance guarantees and fees will be paid in accordance with milestones identified in permit application. CMP and the general contractor will coordinate with the City of Portland and schedule the preconstruction meeting, as well as obtain all pertinent permits, prior to commencement of work on-site.

1. Street Opening and Street Occupancy Permits

Expansion of the existing substation will include the installation of a bathroom within the control house, outfitted with a toilet and wash basin. The installed bathroom facility will tie into the City's water, storm, and sewer lines. Additionally, the general contractor may need to enter adjacent manholes in the street to adjust cable routing. Construction associated with the above reference activities will be in compliance and adhere to the regulations from the City's ordinances of Chapter 24 Sewers, Chapter 25 Streets, Sidewalks, and Other Public Places, and Chapter 32 Stormwater.

2. Blasting

No blasting will be required for construction of the proposed substation expansion.

3. Building Code

CMP and its general contractor will employ the best practices, as applicable, of Chapter 33 Safeguards During Construction, from the 2015 International Building Code.

D. Construction Administration and Communication

Prior to construction commencement, the proper construction signage will be posted on-site and will remain on-site throughout construction. The construction sign will include contact information for both CMP and the general contractor. CMP and the general contractor will work closely with adjacent businesses and provide pertinent information, as far in advance as possible, in regards to scheduled work, particularly construction activities that would result in any significant rise in noise, vibration, or dust.

All construction signage will be temporary and removed at the completion of construction. However, CMP will affix proper and permanent substation signs on the perimeter of the substation fence after completion of the construction. The permanent signs will provide substation identification (address) and CMP contact information.

E. Construction Schedule

A timeline of the construction schedule will be submitted at or prior to the preconstruction meeting with the City. The general contractor will adhere and comply with the construction hour and noise ordinances as defined in Section 17-28 Construction Activities for Building Permit and Section 25-129 Noise, Dust, and Debris. However, due to required outages, installation of mobile station, and cutover of circuits from the old equipment to the newly installed gear, night work may be needed to complete those activities. To the best extent possible, night work activities will be limited and completed in an orderly fashion. CMP and its general contractor

will also coordinate with the City and inform adjacent businesses prior to the start of any night work.

All equipment and material delivered to the site will be off-loaded as soon as possible without drastically affecting adjacent pedestrian and vehicle traffic.

F. Security & Public Safety

1. Proper construction signage will be placed along Marginal Way and Forest Avenue to inform the public of the substation expansion construction. Additionally, the general contractor will erect a temporary chain-link fence around the perimeter of the substation expansion yard, but not obstructing the public walkways on Marginal Way and Forest Avenue. The temporary chain-link fence will provide public safety, serving as a barrier between public and construction activities, as well as security of the gear and equipment within the substation yard throughout construction. Upon completion of construction, a permanent eight-foot-tall chain-link security fence will be erected around the entire perimeter of the substation yard and the temporary chain-link fence will be removed.
2. CMP and its general contractor will ensure all activities associated with construction, alteration and demolition, include those involved with underground activities comply with the NFPA 1 Chapter 16 Safeguarding Construction, Alteration, and Demolition Operations.
3. Prior to construction, an overall construction of demolition fire safety program will be developed. The program will include, but not limited to:
 - Good housekeeping
 - On-site security
 - Organization and training of an on-site fire brigade
 - Development of a pre-fire plan with the location fire department
 - Rapid communication
 - Consideration of special hazards
 - Protection of existing structures and equipment from exposure fires resulting from construction, alteration, and demolition operations
 - Per discussions during a pre-application meeting with the City's fire department, upon completion of the project the substation will be outfitted with a fire detection system for remote monitoring. The fire detection system will also be tied into the City's fire and safety system, where the City will automatically be notified of an event.
4. Not applicable. There will be no blasting associated with the project.
5. Prior to construction, the general contractor will identify the temporary lighting on the construction management plan's site plan. Due to the potential need on night work, the temporary lighting will be installed as "work light". The work light controls will be designed such that they may be manually turned on and off only. The luminaries will be in place such that the aiming point is directed at the work areas. All lighting will be designed and shielded to avoid undue adverse impact on neighboring properties.

G. Construction Permitting and Traffic Control Plans

CMP and the general contractor will coordinate with the City of Portland and obtain all pertinent permits prior to commencement of work on-site.

1. *Construction Activity in Public Streets*

The general contractor will adhere and comply with the rules and regulations standard from Chapter 25 Street, Sidewalks, and Other Public Places of Portland's City Code of Ordinance. Additionally, the general contractor will perform BMPs and adhere to the erosion control techniques consistent with CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (CMP 2018).

2. *Sewer and Stormwater*

The general contractor will adhere and comply with the rules and regulations standards from Chapters 24 Sewer and 32 Stormwater of Portland's City Code of Ordinance. Additionally, the general contractor will adhere to the standards in the Stormwater Management Study (SMS), which describes the stormwater controls and BMPs that will be applied during construction.

3. *Traffic Control Plans*

As indicated above, the project will tie into the City's sewer and stormwater system and may need to access adjacent manholes for cable routing. Additionally, per discussion with Jeff Tarling, Portland City Arborist, trees will be replaced along the Forest Avenue frontage and additional trees will be planted along Marginal Way as well. As a result of and for safety concerns, the public sidewalk and adjacent traffic lane would be rerouted during construction. CMP and its general contractor will coordinate with the City and submit a satisfactory 'maintenance of traffic' (MOT) plan. The MOT plan will be implemented with techniques and devices in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

Vehicles travel to and from the project site will adhere to the speed limit and traffic pattern imposed for Forest Avenue and Marginal Way. Access to the substation will be strictly limited to the driveway, which is located at 14 Marginal Way. To the best of their abilities, the general contractor will utilize the driveway/yard as much as possible, particularly in regards to equipment load and unload. Should load and unload of equipment extent into the street, proper signs and flaggers will be in place to accomplish the task.

H. Site Management and Controls

The general contractor will address maintaining the site in a safe condition and will include regular trash and debris removal, street cleaning and damage controls (if necessary), dust control per City of Portland's Section 25-129 on Noise, Dust and Debris, and noise control per City of Portland's Section 17-18 of the City Code and Section 25-129 on Noise, Dust, and Debris. In the event that construction is conducted in the winter season, snow/ice removal will comply with Section 25-173 Contractors. Specific snow/ice removal activities will include:

- Snow/ice removal or commence automatically from 1" of snow (or ice) and up
- Remove snow as needed within the work zone, include parking spaces and not blocking any driveways or sight lines with piles of snow

- Clear all walks and ramps within the work zone
- Sand or salt as needed
- Clear all basin or drainage to aid in snow melt

I. Erosion Control and Preservation of Trees

The general contractor will install erosion and sediment control measures prior to start of construction, to be inspected by the City. In addition to BMPs, the general contractor will perform erosion and sediment control techniques consistent with CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (CMP 2018), which will be attached as an appendix to the SMS. The general contractor will be responsible for routine inspection, and repair where necessary, of the erosion and sediment control measures on-site.

As part of the site development, CMP will preserve the natural landscape and existing vegetation to the extent practical. The row of pine trees along the eastern boundary are outside the limit of disturbance (LOD) and will remain. However, if any of these pine trees are impacted by grading, they will be replaced. There are several pine trees and birches in the center of the parcel that will be removed to make room for the expansion. All ground disturbance and exposed soil associated with the project will be revegetated with groundcover planting; grass.

As recommended by Jeff Tarling, Portland City Arborist, CMP will replace the three existing trees along the Forest Avenue frontage with Armstrong Red Maple trees. Two new additional Armstrong Red Maple trees will be planted; one in the open space at the southern corner of the property near the intersection of Marginal Way and Forest Avenue, and one in the northern corner of the property, adjacent to the bank parking lot. One additional tree adjacent to Marginal Way may be impacted by grading; if so, it will be replaced with an Armstrong Red Maple.

All equipment and material stored on-site during construction will be locked and secured, and to the best extent possible away from trees and adjacent sidewalks.

J. Construction Staging Area

A general site plan will be submitted at or prior to the pre-construction meeting. The general site plan will depict the locations of material staging areas, on-site temporary construction trailers, on-site truck delivery holding areas, general location of the construction security fence and the general location of the temporary construction dumpster.

Access to the substation yard will be from the driveway at Marginal Way. To the best of their abilities, the general contractor will utilize the driveway/yard as much as possible, particularly in regards to parking and equipment load and unload. However, the overall storage space is limited at the yard, where off-site storage and marshalling area may be needed. If needed, the general contractor will be responsible for identifying the off-site location. Once available, the off-site location will be submitted to the City for review and comment.

K. Parking During Construction

During construction, access to the substation will be strictly limited to the driveway, which is located at 14 Marginal Way. To the best of their abilities, the general contractor will utilize the

driveway/yard as much as possible, particularly in regards to parking and equipment load and unload. Should load and unload of equipment extent into the street, proper signs and flaggers will be in place to accomplish the task.

Construction will result in removal of excavated spoils. Gravel/crushed stone will be trucked in and placed within the fenced yard to grade. The overall truck volume from the activities will vary throughout the course of the construction period. The general contractor will adhere to the speed limit and traffic pattern imposed for Forest Avenue and Marginal Way and comply with the standards in the MOT plan when on-site.

L. Dewatering Plans

A SMS has been developed for the project. The general contractor will adhere to the standards in the SMS, which describes the stormwater controls and BMPs that will be applied during construction. The treatment and control stormwater runoff at the substation yard is considered a BMP, as approved by the Maine Department of Environmental Protection. During construction, the stormwater drainage patterns will mimic pre-development conditions. Majority of stormwater from the exterior of the substation will be intercepted by a grassed, underdrained filter. Overflow from these BMPs will drain to a proposed storm drain line with ultimate discharge to the City's storm drain system along the western side of the property. CMP and its general contractor will obtain approval from the City prior to discharge.

M. Special Measures as Necessary

Once commenced, construction activities on expanding of the substation yard will be continuous and completed in a timely fashion. As a result, there are no special measures needed for this project.

3523/84

4836

Att. J

QUITCLAIM DEED
(without covenant)

CENTRAL MAINE POWER COMPANY, a Maine corporation having its principal office at 9 Green Street, Augusta, Kennebec County, Maine 04330, for consideration paid, releases to the STATE OF MAINE, Department of Transportation, Bureau of Highways, Augusta, Maine 04330, the following described parcels of land, situated in Portland, Cumberland County, Maine:

Being Parcels Nos. (967-2) and (967-3) as shown on Sheet No. 60 of 73 sheets of a map entitled "Maine State Highway Commission, Right of Way Map, State Highway '295', Portland, Cumberland County, Federal Aid Project No. I-295-3(29)", dated January 1967. Said map is filed in the office of the Department of Transportation, Bureau of Highways (File No. 3-185) and will be recorded in Cumberland County Registry of Deeds. Said parcels being more particularly bounded and described as follows:

Parcel No. (967-2)

Beginning at a point on the northwesterly line of land of Central Maine Power Company and on the southeasterly line now of the State of Maine formerly of A. R. Wright Company, said point being about thirty-nine and five tenths (39.5) feet distant southeasterly from and as measured along a line at right angles to the Ramp "F.A.7" Base Line at P. T. Station 0+78.54;

Thence southwesterly by a direct course a distance of thirty-eight and ninety-four hundredths (38.94) feet to a point twelve and five tenths (12.5) feet distant northeasterly from and as measured along a line at right angles to the Ramp "F.A.7" Base Line at P. C. Station 0+00.00;

Thence S. 33° 08' 04" E. a distance of one hundred thirty-eight and sixty-five hundredths (138.65) feet to a point forty-seven and five tenths (47.5) feet distant northeasterly from and as measured along a line at right angles to Forest Avenue Base Line at P. C. Station 9+75.66;

Thence along a curved line to the left having a radius of sixty-five and five tenths (65.5) feet, a distance of eighty-four and sixty hundredths (84.60) feet to a point;

Thence N. 72° 51' 56" E. a distance of about thirty-five (35) feet to a point on the present northeasterly side line of Marginal Way, said point being about one hundred thirty-one (131) feet distant northeasterly from and as measured along a line at right angles to Forest Avenue Base Line at about Station 9+02.5;

Thence southwesterly and northwesterly along the present side lines of Marginal Way and Forest Avenue, respectively, a distance of about two hundred forty-five (245) feet to its intersection with the southeasterly line of land now of the State of Maine, formerly of A. R. Wright Company;

Thence northeasterly along the southeasterly line of land now of the State of Maine, formerly of A. R. Wright Company, a distance of about forty (40) feet to the point of beginning.

Said parcel contains approximately 1680 square feet.

Parcel No. (967-3)

Beginning at a point on a line between land of the Grantor and land formerly of A. R. Wright Company, now State of Maine, and being about forty-one (41) feet distant southeasterly from and as measured along a line at right angles to the Ramp "F.A.7" Base Line at P. C. Station 2+16.36;

Thence northeasterly along land of the State of Maine a distance of about one hundred four (104) feet to a point;

Thence southerly along the westerly line of land formerly of Portland Terminal Company, now State of Maine, a distance of about one hundred twenty-three (123) feet to a point one hundred twenty-five (125) feet distant southeasterly from and as measured along a line normal to the Ramp "F.A.7" Base Line at about Station 2+25;

Thence northwesterly by a direct course a distance of about eighty-five (85) feet to the point of beginning.

Said parcel contains approximately 4615 square feet.

Meaning and intending to convey and hereby conveying portions of the premises conveyed to Cumberland County Power and Light Company by Portland Electric Company by deed dated July 24, 1912 and recorded in Cumberland County Registry of Deeds, Book 899, Page 118. Said premises were acquired by Central Maine Power Company by deed of Cumberland County Power and Light Company dated December 3, 1942 and recorded in said Registry, Book 1699, Page 476.

And for the aforesaid consideration, the Grantor does hereby grant unto the State of Maine, its successors and assigns, the right to enter, construct and maintain an Overhead Truss Sign Base, on land of the Grantor herein, adjoining the boundary lines of State Highway "295", as established, and within the limits defined by "Construction Easement Lines" as shown on said Right of Way Map, located within the following described parcel of land:

Beginning at a point on the Right of Way line as established under a Notice of Layout and Taking for State Highway "295", Portland, dated March 8, 1973 and recorded in Cumberland County Registry of Deeds, Book 3367, Page 58, said point being northeasterly of and on a line normal to the Forest Avenue Base Line at Station 9+93;

Thence N. 33° 08' 04" W. along said Right of Way line a distance of about twenty-five (25) feet to a point, said point being northeasterly of and on a line normal to the Forest Avenue Base Line at Station 10+17;

Note:
Incorrect
Deed
Reference

56
Thence northeasterly along said normal line extended a distance of two and five tenths (2.5) feet to a point;

Thence S. 33° 08' 04" E. a distance of about twenty-five (25) feet to a point northeasterly of a line normal to the Forest Avenue Base Line at Station 9+93;

Thence southwesterly along said normal line a distance of two and five tenths (2.5) feet to the point of beginning.

Said lot contains approximately 62 square feet.

Also granting unto the State of Maine, its successors and assigns, the right to enter upon land of the Grantor outside of and adjoining the land herein conveyed, for all purposes necessary to grade said adjoining land from right of Forest Avenue Base Line at about Station 9+55 to about Station 11+14, being defined as "Grading Limits" as shown on said Right of Way Map.

Also granting unto the State of Maine, its successors and assigns, the right of access to or egress from State Highway "295" to or from adjoining land of the Grantor from right of Forest Avenue Base Line at Station 9+02.5 to right of Ramp "F.A.7" Base Line at Station 2+25.

The Grantor hereby consents to said State of Maine constructing and maintaining a highway within the boundaries designated as Item No. 968-1 as shown on Temporary Sheet No. 3 of 5 sheets and Item No. 968-2 as shown on Sheet No. 61 of 73 sheets of said Right of Way Maps upon which land said Grantor has joint pole line easement rights with NET&T Co. at the following locations: extending northeasterly from the northeasterly side of Forest Avenue southerly of Station 318+18 to 319+25; and extending northwesterly from the northerly side of Winslow Street and about 280 feet southwesterly of the southwesterly line of Forest Avenue.

Excepting and reserving to the Grantor, its successors and assigns, the perpetual right and easement to construct, repair, replace, operate and maintain its electric distribution lines, together with appurtenant equipment and facilities connected therewith as the same are now or hereafter may be located, over, along and across the premises hereby conveyed; also the right to cut, trim, spray, treat with a chemical preparation and remove such trees, branches and underbrush as may in the opinion of the Grantor, its successors and assigns, interfere with or endanger the operation and maintenance of said electric lines; together with the right to enter upon the premises hereby conveyed at any time for any or all of the foregoing purposes.

This conveyance is in confirmation of a certain taking by eminent domain of said property and rights of Central Maine Power Company by the State of Maine, acting through its Department of Transportation, Bureau of Highways, as described in a "Notice of Layout and Taking" for State Highway "295" Portland, dated February 28, 1973 and recorded in Cumberland County Registry of Deeds, Book 3367, Page 58.

The Grantor covenants and agrees that it will obtain the release of the premises hereby conveyed from the lien of its First and General Mortgage to The First National Bank of Boston, Trustee, Successor to Old Colony Trust Company, dated as of June 1, 1921, and indentures supplemental thereto, on or before May 1, 1975.

IN WITNESS WHEREOF, Central Maine Power Company has caused its corporate name to be signed and its ~~corporate~~ seal affixed hereto by F. F. Ludwig, its Treasurer, thereunto duly authorized, this eighteenth day of March, in the year of our Lord one thousand nine hundred and seventy-four.

Signed, Sealed and Delivered
in presence of

CENTRAL MAINE POWER COMPANY

G. H. Beman

By: F. F. Ludwig
Treasurer



STATE OF MAINE
COUNTY OF KENNEBEC

The foregoing instrument was acknowledged before me this eighteenth day of March, 1974, by F. F. Ludwig, Treasurer of Central Maine Power Company, on behalf of the corporation.

Gerald H. Beman
Justice of the Peace

Consideration: \$12,100.

MAR 26 1974

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE

Received at 8 H 30 AM, and recorded in

BOOK 3523

PAGE 84

Margaret E. Beman Register

State Highway "295" Portland
Project I-295-3(29) D.O.T. File #3-185
Parcel No. 967-2.3

QUITCLAIM DEED
(without covenant)

CENTRAL MAINE POWER COMPANY

to

STATE OF MAINE

Dated: March 18, 1974

*m
St Dept of Transp.*

MAR 26 1974

8-30

Copy
Xr Trans - Original Documents

Cum. Registry
Book 1768 Page 54

KNOW ALL MEN BY THESE PRESENTS

12/27/44

That PORTLAND RAILROAD COMPANY, a corporation duly organized and existing under and by virtue of the laws of the State of Maine and having its office and principal place of business at Portland, in the County of Cumberland, said State, in consideration of One Dollar and other valuable consideration to it paid by CENTRAL MAINE POWER COMPANY, a corporation duly organized and existing under and by virtue of the laws of the State of Maine and having its office and principal place of business at Augusta, in the County of Kennebec, said State, the receipt whereof is hereby acknowledged, does hereby remise, release, bargain, sell and convey, and forever quitclaim unto the said Central Maine Power Company, its successors and assigns forever, the following described property:

1. A certain lot or parcel of land, with wharf and buildings located thereon, together with the electrical equipment and appurtenances therein, situated in said City of Portland at the northerly corner of Forest Avenue and Marginal Way, and bounded and described as follows: Beginning at the corner formed by the intersection of the northeasterly side line of Forest Avenue with the northwesterly side line of Marginal Way; thence northwesterly along said northeasterly side line of Forest Avenue about two hundred and seven (207) feet to land or flats conveyed to George F. Wescott and others by Francis Fessenden et als by deed dated August 19, 1889, and recorded in Cumberland County Registry of Deeds in Book 564, Page 180; thence easterly on a line at right angles with the northeasterly side line of what was formerly Deering's Bridge or making an included angle of eighty-nine degrees and eight minutes (89°-08') with said side line of Forest Avenue and along the southeasterly line of land formerly of said Wescott two hundred seventy-six (276) feet, more or less, to what was formerly the center of the channel; thence in a general southwesterly direction by what was formerly the center of said channel to a point in the westerly

line of flats formerly owned by W. W. Thomas, said point being one hundred and thirty-five (135) feet, more or less, northwesterly from the northwesterly side line of Marginal Way; thence southerly by said Thomas flats one hundred and thirty-five (135) feet, more or less, to said Marginal Way; thence southwesterly along the aforesaid northwesterly side line of Marginal Way one hundred and sixty-nine (169) feet, more or less, to the point of beginning; together with whatever rights the Grantor may have in what was formerly said channel; being the piece of land, formerly flats, marked A on a plan recorded in Cumberland County Registry of Deeds in Plan Book 4, Page 25, and a lot of land comprised of the premises numbered five (5) and six (6) on a plan recorded in said Registry of Deeds in Plan Book 4, Page 26.

All of the above described land was conveyed to the said Grantor by Henry Leering et als by their deed of warranty dated June 17, 1891, and recorded in said Registry of Deeds in Book 581, Page 257, and by the Portland Terminal Company by its quitclaim deed dated June 30, 1927 and recorded in said Registry of Deeds in Book 1268, Page 367, and is subject to the rights of Jerome L. Watson and Portland and Rochester Railroad Company to maintain a railroad track across said property as described in a certain agreement between said Grantor, Jerome L. Watson and Portland and Rochester Railroad Company dated September 14, 1896, recorded in said Registry of Deeds in Book 907, Page 229.

The above described premises are conveyed subject to the rights of the City of Portland to repair, replace and maintain its sewers as the same are now located under the above described premises.

Excepting and reserving from the premises hereby conveyed that part of the premises conveyed by this Grantor to Portland Terminal Company by deed dated July 5, 1927, recorded in said Registry, Book 1262, Page 335, which is located within the limits of the premises hereby conveyed.

2. A certain lot or parcel of land, with buildings located thereon, situated in said City of Portland, on the westerly side of that part of St. John Street which runs southerly from Congress Street, and bounded and described as follows: Beginning at a point in the westerly side of St. John Street at the southerly corner of land now or formerly of the City of Portland, being the corner near No. 148 on City valuation plans; thence southerly along said

1/20/51
Cyr
KNOW ALL MEN BY THESE PRESENTS

That CENTRAL MAINE POWER COMPANY, a corporation duly organized and existing under the laws of the State of Maine and having an office and place of business at Portland, in the County of Cumberland, said State, in consideration of One Dollar and other valuable consideration to it paid by the ~~THE CITY OF PORTLAND~~ CITY OF PORTLAND, a body politic organized and existing under the laws of the State of Maine and located in said County of Cumberland, the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey unto the said ~~THE CITY OF PORTLAND~~ City of Portland, its successors and assigns forever, a certain lot or parcel of land situated on the easterly side of Forest Avenue and on the northerly side of Marginal Way, in the City of Portland, more particularly bounded and described as follows:

Beginning at a point on the northerly street line of Marginal Way, said point being distant easterly 32.50 feet, along the said northerly street line of Marginal Way from its intersection with the easterly street line of Forest Avenue as widened by Order of the City Council June 29, 1875, City of Portland Records, Vol. 18, Page 362; thence northwesterly on a curve to the right, said curve having a radius of 40 feet and being tangent to said northerly side line of Marginal Way, to an intersection with the easterly street line of Forest Avenue as above described; thence southerly along said easterly street line of Forest Avenue to the intersection of the easterly side line of Forest Avenue and the northerly street line of Marginal Way; thence easterly along the northerly street line of Marginal Way 32.50 feet to the point of beginning, containing 200 square feet, more or less.

The above described premises are a portion of the premises conveyed to this Grantor by Portland Railroad Company by deed dated December 29, 1944, recorded in Cumberland County Registry of Deeds, Book 1768, Page 54, being a portion of the premises described in Parcel 1 of said deed.

The Grantor hereby covenants and agrees for itself, its successors and assigns, that it will obtain the release of the premises hereby conveyed from the lien of its First and General Mortgage to Old Colony Trust Company, Trustee, dated as of June 1, 1921, and indentures supplemental thereto, on or before May 1, 1951.

TO HAVE AND TO HOLD the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said ~~Central Maine Power Company~~ City of Portland, its successors and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby covenant with the said Grantee, its successors and assigns, that it is lawfully seized in fee of the premises; that they are free of all incumbrances, except as aforesaid; 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 and assigns forever, against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, the said Central Maine Power Company has caused this instrument to be sealed with its corporate seal and signed in its corporate name by H. D. Jennings, its Treasurer, thereunto duly authorized, this 22nd day of January, in the year one thousand nine hundred and fifty-one.

Signed, Sealed and Delivered
in presence of

Richard W. Wilson

CENTRAL MAINE POWER COMPANY

By

H. D. Jennings
Treasurer

WALLPACK® LED

W4PLED - POLYCARBONATE LENS

Perimeter and security lighting requires excellent control and uniformity while minimizing light trespass and glare. The Wallpack LED luminaires excel at this, requiring fewer luminaires to achieve required light levels in infrastructure, industrial and municipal applications. With energy cost reductions up to 77%, expected service life of over 20 years and a vandal-resistant polycarbonate refractor, the Wallpack LED provides the latest lighting technology from the company that introduced the very first Wallpack to the market.



Quick Facts

- + Replaces 100-250W MH
- + Lumen packages from 2,200 - 5,200 lumens
- + Type III optics
- + 4000K, 5000K CCT
- + Weight: 15 lbs

Features

- + Energy savings of up to 77% vs comparable metal halide luminaires; saves more than \$100 per luminaire, per year over 250W metal halide
- + 20+ years service life with lumen maintenance of L98/100,000 hours
- + Luminaire incorporates a one-piece vandal-resistant polycarbonate lens
- + Traditional wallpack form factor for seamless integration into existing applications
- + High-performance LED optics focus the light on the prismatic refractor for higher efficiency and coverage
- + Robust die-cast aluminum housing and durable paint finish for longevity

ORDERING INFORMATION

INFRASTRUCTURE

Wallpack LED - W4PLED

PREFERRED SELECTIONS:

Most Frequently Ordered Catalog Numbers

W4PLED	10C	700	40K	T3M	MVOLT	DMG	SF	BKSDP
1	2	3	4	5	6	7	8	9
LUMINAIRE	PERFORMANCE PACKAGE	DRIVE CURRENT	COLOR TEMPERATURE	DISTRIBUTION	VOLTAGE	CONTROL OPTIONS	OPTIONS	COLOR
W4PLED	10C 20C 30C	700	40K 50K	T3M	MVOLT 120 208 240	PE DMG	SF DF TP LWG	BKSDP GYSDP WHSDP BZSDP

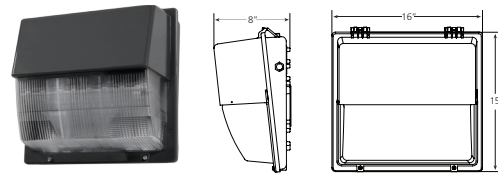
CATALOG NUMBERS FOR ENTIRE PRODUCT OFFERING

(Pricing and lead times may be affected)

STEP 1: LUMINAIRE		
W4PLED Wallpack LED Polycarbonate Lens		
STEP 2: PERFORMANCE PACKAGE		
10C	10 LEDs (one engine)	
20C	20 LEDs (two engines)	
30C	30 LEDs (one engine)	
STEP 3: DRIVE CURRENT		
700	700 mA (.7A)	
STEP 4: COLOR TEMPERATURE		
40K	4000K	
50K	5000K	
STEP 5: DISTRIBUTION		
T3M	Type III Medium	
STEP 6: VOLTAGE		
MVOLT ¹	240 ¹	347 ²
120 ¹	277 ¹	480 ²
208 ¹		
STEP 7: CONTROL OPTIONS		
SHIPPED	INSTALLED	
PE ³	Photoelectric cell, button type	
DMG	0-10V Dimming driver (no controls)	
STEP 8: OPTIONS		
SHIPPED	INSTALLED	
SF ⁴	Single fusing (120,277V)	
DF ⁴	Double fusing (208,240V)	
TP	Tamper resistant screws	
LWG ⁶	Wire guard	

STEP 9: COLOR (REQUIRED)	
GYSDP	Gray
WHSDP	White
BKSDP	Black
BZSDP	Bronze
*Colors are just a representation. Custom colors are available upon request	
STEP 10: ACCESSORIES	
W4GWGU5	Wire guard
1 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options) or photocontrol (PE). 2 Not available with 10C option. 3 Must specify voltage; not available with MVOLT or 480 voltage option. 4 Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option. 5 Required field modification (only when ordered as a separate accessory). 6 Casting is pre-drilled for guard. Wire guard ships separate. Vandal guard ships separate.	

DIMENSIONAL DETAILS



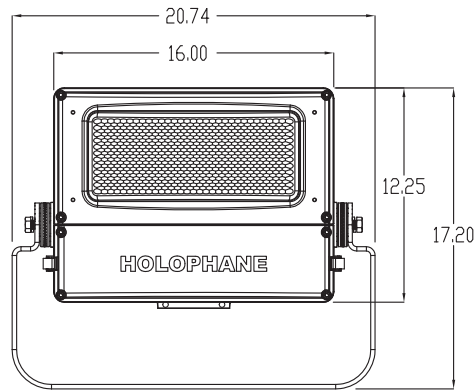
Maximum weight: 15lbs

Model	Watts	Lumens	Metal Halide Replacement
W4PLED 10C 50K	26W	2,200	Up to 100W
W4PLED 20C 50K	45W	4,200	Up to 175W
W4PLED 30C 50K	67W	5,200	Up to 250W

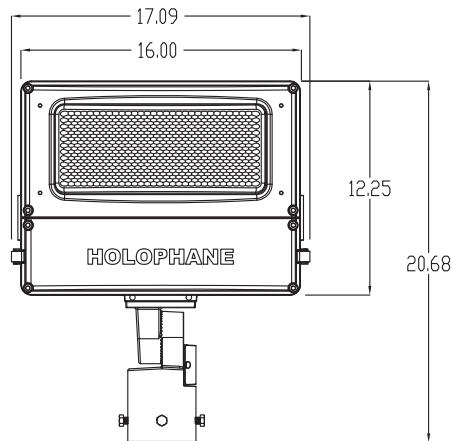
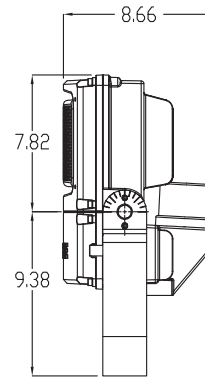


Warranty Five-year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Product specifications may change without notice. Please contact your sales representative for the latest product information.

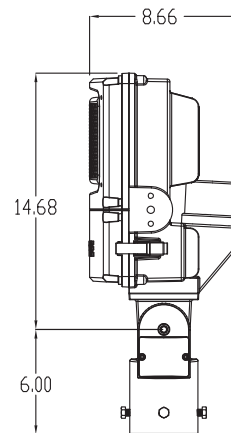
Contact your local Holophane factory sales representative for application assistance, and computer-aided design and cost studies.
For information on other Holophane products and systems, call the Inside Sales Service Department at 866-759-1577.
In Canada call 905-886-8967 or fax 905-886-7973.



Yoke Mount: EPA= 1.76 ft. sq. & Weight of 30 lbs.



Tenon Mount: EPA= 1.89 ft. sq. & Weight of 28 lbs.



Customer Preferred: (Most Frequently Ordered Catalog Numbers)
PSLED

PSLED				
Series	Performance Package	Voltage	Direct Distribution	
Predator Small LED	PK1 = 6,000 Lumen Package PK2 = 10,000 Lumen Package PK3 = 14,000 Lumen Package PK4 = 18,000 Lumen Package PK5 = 22,000 Lumen Package	MVOLT = 120-277V 347 = 347V 480 = 480V	NSP = Narrow Spot MFL = Medium Flood FL = Flood WFL = Wide flood WFR = Wide flood rectangle	
Color Temperature	Mounting Method	Color		
30K = 3,000K CCT 40K = 4,000K CCT 50K = 5,000 K CCT	1 = Tenon Slipfitter 3 = Yoke Stainless Steel (Marine Listed) ¹² 4 = Yoke Galvanized	BZSDP = Bronze Super Durable Paint Finish BKSDP = Black Super Durable Paint Finish GYSDP = Grey Super Durable Paint Finish WHSDP = White Super Durable Paint Finish GHSDP = Graphite Super Durable Paint Finish		
Surge Protection		Controls Options		
20KV = 20kV/10kA extreme surge (fail off) 10KVIL = 10kV/5kA fail off w/indicator light 10KVMP = 10kV/5kA MOV (fail on)		PER7 = P7 rotating PC receptacle ¹ PER3 = P3 receptacle ¹ NR = No Photocontrol Receptacle ⁴ DM = 0-10V Driver (No controls) ² DSS = Solid State Photocontrol ¹ DLL = Solid State Long Life ¹ Photocontrol	SH = Shorting Cap ¹ F1 = Single Fusing F2 = Double Fusing AO = Field Adjustable Output ³ PNMT = Part night dimming- Consult factory DALI = Dali Driver Option- Consult Factory	

ORDERING INFORMATION:

Predator[®]
Small LED

Infrastructure
Specialty

HOLOPHANE[®]
LEADER IN LIGHTING SOLUTIONS
An Acuity Brands Company
© 2010 Acuity Brands Lighting, Inc., All Rights Reserved

THIS DRAWING, WHEN APPROVED, SHALL BECOME THE COMPLETE SPECIFICATION FOR THE MATERIAL TO BE FURNISHED BY HOLOPHANE ON THE ORDER NOTED ABOVE. A UNIT OF SIMILAR DESIGN MAY BE SUBSTITUTED FOR THE UNIT ORDERED WITHOUT NOTICE. THE VENDOR SHALL BE RESPONSIBLE FOR ORDERING AND PROVIDING THE MATERIAL TO BE SUPPLIED WITH EACH ANCHOR BOLT ORDER TO MATCH THE POLE LOADED SUBJECT TO RETURN UPON DEMAND AND UPON EXPRESS WRITTEN NOTICE TO OUR INTERESTS, AND ONLY IN CONNECTION WITH MATERIAL FURNISHED BY HOLOPHANE.

ORDER #:
TYPE:
DRAWN: BGW
DATE: 1-29-19
DWG #: LUM_PSLED

Cord Length Option ^{5,6}
04 4 ft. cord length
05 5 ft. cord length
06 6 ft. cord length
08 8 ft. cord length
10 10 ft. cord length
12 12 ft. cord length
15 15 ft. cord length
20 20ft. cord length
25 25ft. cord length
30 30ft. cord length

Cord Length Option
63 16 gage, 3 conductor cord
43 14 gage, 3 conductor cord
23 12 gage, 3 conductor cord
65 16 gage, 5 conductor cord ¹¹

Options/Controls
TL = Tool-less entry
NL = NEMA Label

Accessories
PSLEDV-BZSDP = Full Visor Bronze ⁷
PSLEDV-BKSDP = Full Visor Black ⁷
PSLEDV-GYSDP = Full Visor Grey ⁷
PSLEDV-WHSDP = Full Visor White ⁷
PSLEDV-GHSDP = Full Visor Graphite ⁷
PSLEDUBV-BZSDP = Upper/Bottom Visor Bronze ⁸
PSLEDUBV-BKSDP = Upper/Bottom Visor Black ⁸
PSLEDUBV-GYSDP = Upper/Bottom Visor Grey ⁸
PSLEDUBV-WHSDP = Upper/Bottom Visor White ⁸

PSLEDUBV-GHSDP = Upper/Bottom Visor Graphite ⁸
PSLEDVG = Vandal Guard ⁹
PSLEDWG = Wire Guard ¹⁰
08657-BZSDP = Yoke to 2.375" OD Tenon Adaptor Bronze
08657-BKSDP = Yoke to 2.375" OD Tenon Adaptor Black
08657-GYSDP = Yoke to 2.375" OD Tenon Adaptor Grey
08657-WHSDP = Yoke to 2.375" OD Tenon Adaptor White
08657-GHSDP = Yoke to 2.375" OD Tenon Adaptor Graphite

Notes:

1. Not available with NR
2. Not available with AO
3. Not available with DM
4. Not available with DM, PER7, PER3, SH, DSS, DLL
5. Requires cord length and cord type
6. Not available with TM mounting

7. Not compatible with WG, VG, UBV
8. Not compatible with WG, VG, FV
9. Not compatible with WG, FV, UBV
10. Not compatible with VG, FV, UBV
11. Used with mounting option 3,4 and DM only
12. Marine listing not available with PER3 or PER7

Performance specification

Mechanical

- Low copper content die cast aluminum housings has integral heat sink fins to optimize thermal management through conductive and convective cooling. Bolted or optional stainless steel latch disengages top electrical cover for easy access to LED driver, surge protection, and terminal block. Unit is shipped prewired with specified cord type and cord length to facilitate easy wiring of luminaire.
- Luminaire is vibration rated to 3G per ANSI C136.31-2001 and rated IP66 per IEC60068-2-3.
- Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber per ASTM B117.
- Yoke shall be galvanized or stainless steel. Knuckle mount shall be adjustable to fit 2-3/8 inch to 2-7/8 inch tenon.

Electrical

- LED light engine are rated minimum 100,000 hours at 25C, L70. Electronic driver has an expected life of 100,000 hours at a 25C ambient.
- Robust surge protection: Three different surge protection options provide a minimum ANSI C136.2 (10kV/5kA) protection. Extreme 20kV/10kA protection is also available.
- Driver power factor is 90% minimum. Driver meets maximum total harmonic distortion (THD) of 20% and is ROHS compliant.

Optical

- PCB mounted LED technology comprised of multi-cluster LEDs on single metal core board. Segmented Miro internal reflectors are designed for superior field to beam ratios, uniformity, and spacing.
- NEMA optical pattern choice of narrow spot, medium flood (4X4), flood (5x5) wide flood (6x6), and wide flood rectangle (6x5). The luminaire is available with 3000K, 4000K, and 5000K with minimum CRI of 70.
- Optional shielding available to control light trespass and uplight. Optical enclosure shall be glass lens.

Controls

- NEMA photocontrol receptacle 3 pin (P3) or 7 pin (P7) available.
- Optional premium solid state locking- style photocontrol - DSS (10 year rated life). Optional extreme long life solid state locking -style photocontrol - DLL (20 year rated life)
- Optional onboard adjustable output module (AO) allows the light output and input wattage to be modified to meet site specific requirements.

Standards

- Suitable for ambient temperatures -40C to 40C
- CSA Certified to U.S. and Canadian standards. Marine Outside (Salt water) available.

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Small LED

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ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	1-29-19
DWG #:	LUM_PSLED

Lumen Data Performance

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)		4K/5K (4000K/5000K CCT, 70 CRI)		LLD @ 25°C		
			Lumens	LPW	Lumens	LPW	25k Hours	75k Hours	100k Hours
PK1	NSP	49	4,637	95	5,279	108	0.98	0.96	0.92
	MFL		5,390	110	5,859	120			
	FL		5,526	113	6,006	123			
	WFL		5,704	116	6,200	127			
	WFR		5,553	113	6,035	123			
PK2	NSP	79	7,857	99	8,540	108	0.98	0.96	0.92
	MFL		8,719	110	9,478	120			
	FL		8,939	113	9,716	123			
	WFL		9,227	117	10,029	127			
	WFR		8,982	114	9,763	124			
PK3	NSP	119	11,286	95	12,267	103	0.98	0.96	0.92
	MFL		12,524	105	13,613	114			
	FL		12,839	108	13,956	117			
	WFL		13,253	111	14,406	121			
	WFR		12,901	108	14,023	118			
PK4	NSP	150	14,286	95	15,529	104	0.98	0.96	0.92
	MFL		15,854	106	17,232	115			
	FL		16,252	108	17,665	118			
	WFL		16,776	112	18,234	122			
	WFR		16,331	109	17,752	118			
PK5	NSP	199	17,858	90	19,411	98	0.96	0.92	0.85
	MFL		19,817	100	21,541	108			
	FL		20,315	102	22,082	111			
	WFL		20,969	105	22,793	115			
	WFR		20,414	103	22,189	112			

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ORDER #:
TYPE:
DRAWN: BGW
DATE: 1-29-19
DWG #: LUM_PSLED

Full Visor Option Lumen Data Performance

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)		4K/5K (4000K/5000K CCT, 70 CRI)		LLD @ 25°C		
			Lumens	LPW	Lumens	LPW	25k Hours	75k Hours	100k Hours
PK1	NSP with FV	49	4,644	95	5,129	105	0.98	0.96	0.92
	MFL with FV		4,986	102	5,419	111			
	FL with FV		4,912	100	5,340	109			
	WFL with FV		4,751	97	5,164	105			
	WFR with FV		4,935	101	5,364	109			
PK2	NSP with FV	79	7,634	97	8,297	105	0.98	0.96	0.92
	MFL with FV		8,065	102	8,766	111			
	FL with FV		7,947	101	8,638	109			
	WFL with FV		7,685	97	8,354	106			
	WFR with FV		7,982	101	8,677	110			
PK3	NSP with FV	119	10,965	92	11,919	100	0.98	0.96	0.92
	MFL with FV		11,584	97	12,592	106			
	FL with FV		11,416	96	12,408	104			
	WFL with FV		11,039	93	11,999	101			
	WFR with FV		11,466	96	12,463	105			
PK4	NSP with FV	150	13,879	93	15,086	101	0.98	0.96	0.92
	MFL with FV		14,663	98	15,938	106			
	FL with FV		14,451	96	15,707	105			
	WFL with FV		13,972	93	15,187	101			
	WFR with FV		14,515	97	15,777	105			
PK5	NSP with FV	199	17,349	87	18,857	95	0.96	0.92	0.85
	MFL with FV		18,330	92	19,923	100			
	FL with FV		18,063	91	19,634	99			
	WFL with FV		17,466	88	18,984	95			
	WFR with FV		18,143	91	19,721	99			

Upper/Bottom Visor Option Lumen Data Performance

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)		4K/5K (4000K/5000K CCT, 70 CRI)		LLD @ 25°C		
			Lumens	LPW	Lumens	LPW	25k Hours	75k Hours	100k Hours
PK1	NSP with UBV	49	4,673	95	5,223	107	0.98	0.96	0.92
	MFL with UBV		5,186	106	5,637	115			
	FL with UBV		5,231	107	5,686	116			
	WFL with UBV		5,217	106	5,670	116			
	WFR with UBV		5,319	109	5,781	118			
PK2	NSP with UBV	79	7,774	98	8,450	107	0.98	0.96	0.92
	MFL with UBV		8,389	106	9,118	115			
	FL with UBV		8,462	107	9,197	116			
	WFL with UBV		8,439	107	9,173	116			
	WFR with UBV		8,604	109	9,352	118			
PK3	NSP with UBV	119	11,166	94	12,137	102	0.98	0.96	0.92
	MFL with UBV		12,049	101	13,097	110			
	FL with UBV		12,154	102	13,211	111			
	WFL with UBV		12,122	102	13,176	111			
	WFR with UBV		12,357	104	13,432	113			
PK4	NSP with UBV	150	14,134	94	15,363	102	0.98	0.96	0.92
	MFL with UBV		15,254	102	16,580	111			
	FL with UBV		15,386	103	16,724	111			
	WFL with UBV		15,343	102	16,677	111			
	WFR with UBV		15,643	104	17,003	113			
PK5	NSP with UBV	199	17,667	89	19,204	97	0.96	0.92	0.85
	MFL with UBV		19,066	96	20,724	104			
	FL with UBV		19,233	97	20,905	105			
	WFL with UBV		19,178	96	20,846	105			
	WFR with UBV		19,553	98	21,253	107			

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Performance Data

LAT				
0C	15C	25C	35C	40C
1.06	1.02	1.00	0.98	0.96

PSLED	Input Operating Amps					
	120V	208V	240V	277V	347V	480V
PK1	0.41	0.24	0.21	0.18	0.15	0.11
PK2	0.66	0.39	0.34	0.29	0.22	0.17
PK3	0.99	0.58	0.51	0.45	0.37	0.28
PK4	1.25	0.72	0.63	0.55	0.45	0.34
PK5	1.66	0.96	0.83	0.72	0.58	0.43

AO Module		
AO setting	Lumens %	Wattage %
8	100%	100%
7	100%	100%
6	100%	100%
5	90%	87%
4	79%	75%
3	68%	61%
2	55%	49%
1	42%	37%

WARRANTY

Limited warranty located at
www.acuitybrands.com/CustomerResources/Terms and conditions.aspx

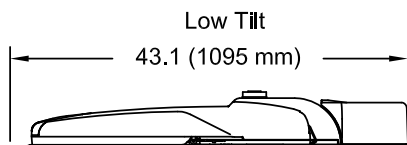
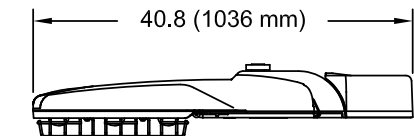
NOTE

Specifications subject to change without notice.

Actual performance may differ as a result of end-user environment and application.

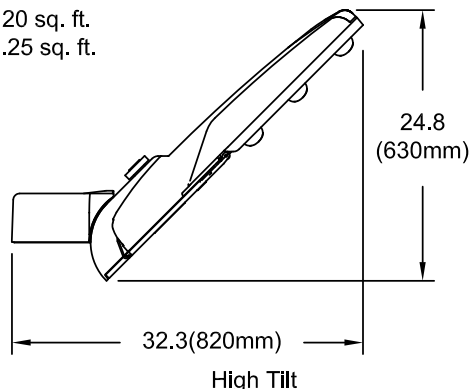
Actual wattage may differ by +/- 8% when operating at nominal input voltage +/- 10%.

ORDER #:
TYPE:
DRAWN: BGW
DATE: 1-29-19
DWG #: LUM_PSLED

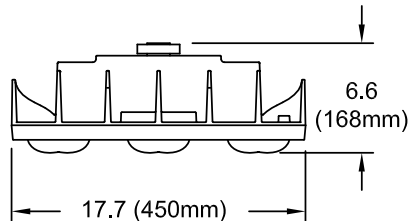
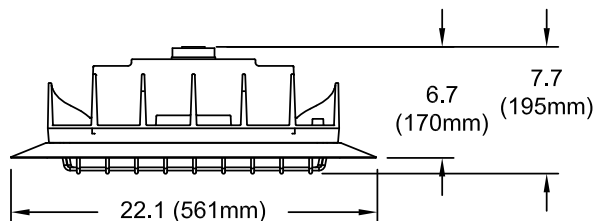


Uplight Skirt

Weight = 50 lbs
EPA Low Tilt = 1.20 sq. ft.
EPA High Tilt = 3.25 sq. ft.



High Tilt



MGLED

Series Code	Number of LED'S	Color Temperature	Voltage
	4= 4 COB	3K= 3000 Kelvin	AS= 120V-277V
	5= 5 COB	4K= 4000 Kelvin	AH= 347V-480V
	6= 6 COB	5K= 5000 Kelvin	
	7= 7 COB		
	8= 8 COB		
	9= 9 COB		
Optics	Tilt Range	Mounting	Color
N = Narrow Roadway	H = High (27° - 45°)	V = Vertical Tenon	G = Gray
M = Medium Roadway	L = Low (0° - 18°)	H = Horizontal Arm	H = Graphite
W = Wide Roadway		A = Architectural	K = Black
F = Forward Throw (Type 4)			N = Green
A = Area (Type 5)			W = White
			Z = Bronze

Standard Options

NL = NEMA Label
P3 = 3 PIN NEMA Photocontrol Receptacle
P5 = 5 PIN NEMA Photocontrol Receptacle
P7 = 7 PIN NEMA Photocontrol Receptacle
DM = 0V – 10V dimmable driver
DE = ROAM Concierge/Enterprise
VE = ROAMview
PCSS = DSS 120-277V Photocontrol
PCL1 = DLL 120V Photocontrol
PCL3 = DLL 347V Photocontrol
PCL4 = DLL 480V Photocontrol
PSC = Shorting Cap
SP= Individual unit/Sample pack
US = Uplight Skirt

Special Options *

ML=Multi-Level Dimming
CLO = Constant Lumen Output
*Additional information is required from the customer. Please contact Infrastructure TSG for assistance.

Accessories

MGLEDWG = WIRE GUARD KIT

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LED Roadway Lighting

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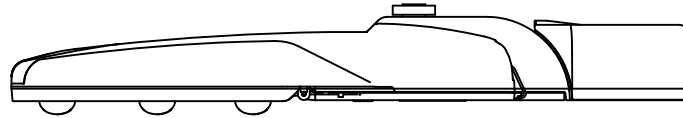
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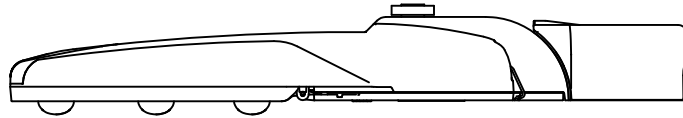
ORDERING INFORMATION:

ORDER #:
TYPE:
DRAWN: MRP
DATE: 2-12-19
DWG #: MONGOOSE LED

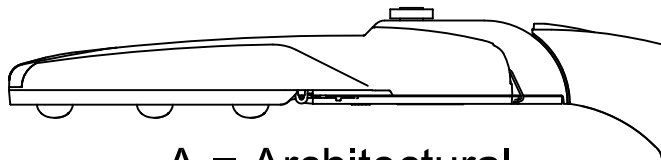
Mounting



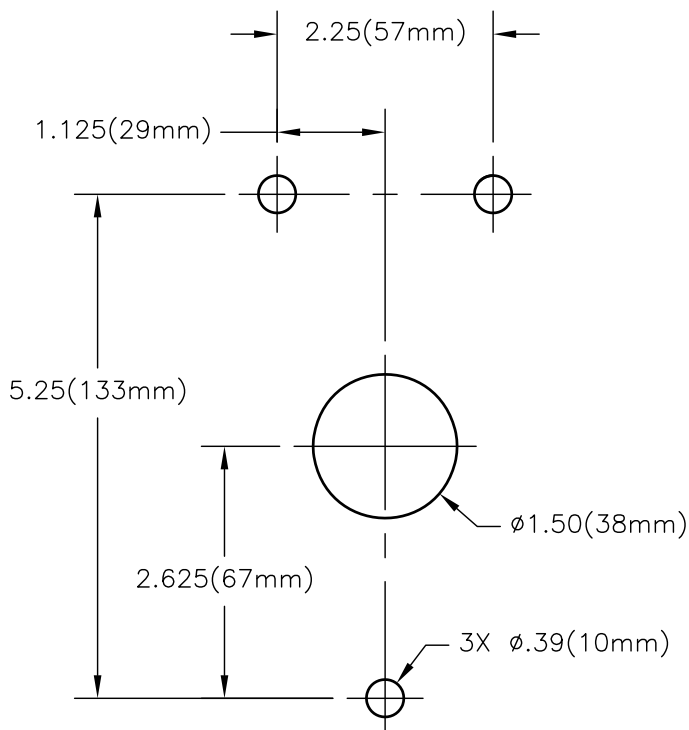
V = Vertical Tenon
Attaches to 2" Vertical Tenon



H = Horizontal Arm
Attaches to 2" Horizontal Arm



A = Architectural
Attaches to Square Pole or Tenon
Adaptor (See Pole Pattern Below)



MONGOOSE LED™
LED Roadway Lighting

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Outdoor**

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ORDER #:

TYPE:

DRAWN: MRP

DATE: 2-12-19

DWG #: MONGOOSE LED

Specifications

Optical

- Performance is comparable to 150 - 400 watt HID
- IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation
- 4,000K CCT, 70 CRI Min. or optional 5,000K CCT, 70 CRI Min.
- Available with Narrow roadway, Medium Roadway, Wide Roadway, Forward Throw, and Area Type lighting distributions

Electrical

- Electronic driver has an expected life of 100,000 hours at 25°C
- LED light engines are rated > 100,000 at 25°C, L70
- Robust ANSI/IEEE 62.41 Category C 10kV/5kA surge protection.

Mechanical

- Rugged low copper diecast aluminum coupled with a rigorous 5-stage pretreatment, epoxy basecoat and polyester topcoat yield a finish that achieves a scribe creepage rating of 8 after 5,000 hours of salt spray.
- Removable "power door" facilitates product installation and maintenance
- Corrosion resistant stainless steel latches ensure secure closure over the long fixture life
- Multiple mounting configurations allow for attachment to horizontal mast arms, pole top tenons, and direct mounting to square poles. All Mountings are 3G vibration rated per ANSI C136
- Adjustable fixture tilt from 0 - 45 degrees provides flexibility to optimize lighting performance

Controls

- Premium solid state locking-style photocontrol - PCSS (10 year rated life)
- Extreme long life solid state locking-style photocontrol - PCLL (20 year rated life)
- Multi-level dimming
- DE and VE options allow the fixture to be dimmed using the ROAM control system

Warranty & Standards

- 5 Year limited warranty. Full warranty terms located at http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
- Rated for -40C to 40C ambient
- CSA Certified to US and Canadian standards

0° TILT LUMEN DATA PERFORMANCE

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)		4K/5K (4000K/5000K CCT, 70 CRI)		LLD @ 25°C		
			Lumens	LPW	Lumens	LPW	25k Hours	75k Hours	100k Hours
4	N	168	19,928	119	21,428	128	0.89	0.86	0.83
	M		19,578	117	21,051	125			
	W		19,191	114	20,635	123			
	F		18,772	112	20,185	120			
	A		20,725	123	22,285	133			
5	N	210	24,910	119	26,785	128	0.89	0.86	0.83
	M		24,472	117	26,314	125			
	W		23,988	114	25,794	123			
	F		23,466	112	25,232	120			
	A		25,907	123	27,857	133			
6	N	255	30,496	120	32,525	128	0.89	0.86	0.83
	M		30,137	118	31,953	125			
	W		29,691	116	31,321	123			
	F		28,494	112	30,639	120			
	A		31,458	123	33,826	133			
7	N	296	35,390	120	38,021	128	0.89	0.86	0.83
	M		35,072	118	37,205	126			
	W		34,691	117	36,461	123			
	F		33,309	113	35,816	121			
	A		36,774	124	39,542	134			
8	N	336	40,152	120	43,083	128	0.89	0.86	0.83
	M		39,762	118	42,142	125			
	W		39,106	116	41,385	123			
	F		37,743	112	40,584	121			
	A		41,670	124	44,806	133			
9	N	376	44,789	151	48,283	163	0.89	0.86	0.83
	M		44,353	150	47,185	159			
	W		43,587	147	46,416	157			
	F		42,299	143	45,483	154			
	A		46,699	158	50,214	170			

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LED Roadway Lighting

Infrastructure
Outdoor

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ORDER #:

TYPE:

DRAWN: MRP

DATE: 2-12-19

DWG #: MONGOOSE LED

0° TILT with US OPTION LUMEN DATA PERFORMANCE

Performance Package	Distribution	Input Watts	3K (3000K CCT, 70 CRI)		4K/5K (4000K/5000K CCT, 70 CRI)		LLD @ 25°C		
			Lumens	LPW	Lumens	LPW	25k Hours	75k Hours	100k Hours
4	N with US	168	19,715	117	19,715	117	0.89	0.86	0.83
	M with US		19,268	115	19,268	115			
	W with US		19,002	113	19,002	113			
	F with US		18,770	112	18,770	112			
	A with US		20,121	120	20,121	120			
5	N with US	210	24,610	117	24,610	117	0.89	0.86	0.83
	M with US		24,065	115	24,065	115			
	W with US		23,711	113	23,711	113			
	F with US		23,376	111	23,376	111			
	A with US		25,126	120	25,126	120			
6	N with US	255	29,897	117	29,897	117	0.89	0.86	0.83
	M with US		29,252	115	29,252	115			
	W with US		28,835	113	28,835	113			
	F with US		28,350	111	28,350	111			
	A with US		30,501	120	30,501	120			
7	N with US	296	34,657	117	34,657	117	0.89	0.86	0.83
	M with US		33,738	114	33,738	114			
	W with US		33,298	112	33,298	112			
	F with US		32,867	111	32,867	111			
	A with US		35,314	119	35,314	119			
8	N with US	336	39,442	117	39,442	117	0.89	0.86	0.83
	M with US		38,395	114	38,395	114			
	W with US		37,891	113	37,891	113			
	F with US		37,358	111	37,358	111			
	A with US		40,154	120	40,154	120			
9	N with US	376	44,670	151	44,670	151	0.89	0.86	0.83
	M with US		43,415	147	43,415	147			
	W with US		43,061	145	43,061	145			
	F with US		42,345	143	42,345	143			
	A with US		45,473	154	45,473	154			

MONGOOSE LEDTM
LED Roadway Lighting

Infrastructure
Outdoor


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ORDER #:

TYPE:

DRAWN: MRP

DATE: 2-12-19

DWG #: MONGOOSE LED

Stormwater Management Study

Central Maine Power Company

**Forest Avenue Substation Expansion
Project No. 102676**

**Revision 0-0A
11/26/2019**

Stormwater Management Study

prepared for

**Central Maine Power Company
Forest Avenue Substation Expansion
Portland, Maine**

Project No. 102676

**Revision 0-0A
11/26/2019**

prepared by

**Burns & McDonnell Engineering Company, Inc.
Portland, Maine**

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INDEX AND CERTIFICATION

Central Maine Power Company Stormwater Management Study Project No. 102676

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Certification

I hereby certify, as a Professional Engineer in the state of Maine, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the Central Maine Power Company or others without specific verification or adaptation by the Engineer.

Robbyn Lynn Reed, P.E., ME #12808

Date: _____

Reference information provided by others and not certified by the above sealing Engineer

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
BMP	Best Management Practice
CFS	Cubic Feet per Second
CMP	Central Maine Power Company
CN	Curve Number
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPS	Foot per Second
Maine DEP	Maine Department of Environmental Protection
NAG	North American Green
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
SCS	Soil Conservation Service
TR-55	Technical Release 55 Urban Hydrology for Small Watersheds
USDA	United States Department of Agriculture
USGS	United States Geological Survey

1.0 SITE CONDITIONS

1.1 Location & Project Description

The project is located at an existing substation at 14 Marginal Way in the City of Portland, Cumberland County, Maine (Site). The Site lies on a 0.856-acre parcel owned by Central Maine Power Company (CMP), consisting of an existing substation, driveway, and grassed open space. The parcel is bordered on the west by Forest Avenue, Marginal Way to the south, an I-295 North on-ramp to the north, and a commercial development to the east. The Site is mostly level with the substation at the high point draining overland towards the perimeter of the site. A copy of United States Geological Survey (USGS), Portland West Quadrangle Topographical Map showing the Site location is provided for reference in Appendix A.

The proposed development will consist of a yard expansion to include a new control house and transformer with space allocated for a future transformer. The existing equipment within the yard will be removed except for the existing control house. To comply with CMP's oil containment preference, the yard expansion and existing yard will be regraded so that the area around the transformers, yard, and approximately one-half of the new control house will drain to a proposed catch basin which will connect into the oil containment structure. A gravel containment berm will also be provided around this area in accordance with CMP standards. Regrading and repaving of the existing bituminous driveway is required in a localized area near the substation vehicular access gate. Existing fence and gate structures will be removed and replaced, with the exception of the removal and addition of fence on the western side of the Site to accommodate the expansion.

The project will result in approximately 0.852 acres of disturbance from site construction, of which 0.459 acres will be re-vegetated. The remaining 0.393 acres will be developed with crushed rock substation stone surfacing, the control house, substation equipment, an asphalt pavement private way, and necessary repairs to the sidewalk and roadway. The disturbed areas outside of the substation gravel area will be reseeded with native grasses at the completion of the site development and grading work.

1.2 Floodplain

The Site is in Zone X (no screen) as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Number 230051 0013 B, effective date July 17, 1986. Zone C is defined as "areas of minimal flooding". Additionally, the Revised Preliminary FRIM Map Number 23005C0692F, dated 4/14/2017 shows the site in Zone X (no screen), "area of minimal flood hazard", or outside the area of 0.2% annual chance flood hazard, representing a 500-year event. The FEMA FIRMs are provided for reference in Appendix B.

1.3 Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey identifies the existing Site soils as “Cut and fill land” with a natural drainage class of “moderately well drained”. The hydrologic soil group is unclassified for the Site.

A geotechnical investigation was performed and detailed in the report: “Geotechnical Engineering Report, Iberdrola Central Maine Power Substation Modernization Project, Forest Avenue – Portland, Maine”, prepared by Terracon Consultants, Inc., dated June 19, 2018. Site and subsurface conditions were generally noted in the report as a 5 to 9 inch layer of topsoil over fill material consisting of poorly graded sand, trace gravel to sand with silt, and occasional brick rubble. This fill layer varies in depth from 8.5 to 13 feet below existing grade. The native soils underlying the fill are Silt with Sand (ML) and Lean Clay (CL). The boreholes were observed while drilling and after completion for the presence and level of groundwater. Groundwater readings varied from 8 to 12.5 feet below grade. Copies of the NRCS and Terracon reports are provided for reference in Appendix C.

No Soil infiltration data was received, and no infiltration of runoff was assumed for modeling purposes.

1.4 Pre-Development Site Conditions

The Site is mostly level with the substation at the high point draining overland towards the perimeter of the site. The substation yard consists of a sandy gravel material and is surrounded by a gravel containment berm. An existing catch basin is located at the edge of the driveway, south of the yard. The discharge location of this pipe could not be determined from field investigation or record drawings.

The City of Portland recently completed a sewer separation project which resulted in a new storm drain crossing Forest Avenue and continuing in the Maine Department of Transportation (MEDOT) right of way north of the parcel. This storm drain ultimately discharges into Back Cove. The majority of the Site’s runoff reaches the new storm drain.

Non-substation surface cover is primarily grassed with moderately spaced small trees and shrubs. The grassed area between the on-ramp and the edge of the MEDOT right of way catches runoff which ultimately flows towards Preble Street. It is likely that area connects to the new storm drain, however additional investigation would be required for confirmation.

Along the parcel’s frontage with Marginal Way, there is a high point. The southeastern edge of the

parcel drains towards Marginal Way and then continues draining east in the Marginal Way gutter. It is unknown if the drainage system on Marginal Way connects to the combined system.

Topographic information indicates no off-site drainage reaches the Site.

1.5 Post-Development Site Conditions

To comply with CMP's oil containment preference, runoff within the area of the proposed containment berm in the yard – containing the transformers, other equipment and approximately one half of the new control house – will be directed to a catch basin with sump. Discharge from this catch basin will enter an oil containment manhole with oil stop valves and alarms, which would allow runoff without oil to discharge and prevent runoff containing oil from discharging.

CMP construction criteria requires the substation yard to be 6 inches of crushed stone underlain by 18 inches of gravel. The voids in crushed stone in the lowest portion of the yard surrounding the new catch basin can be used to store runoff. Water stored in this area would evaporate and infiltrate into the underlying gravel rather than being discharged.

The majority of the vegetated area bounded by the substation yard and sidewalk will be graded to a grassed, underdrained soil filter that provides infiltration and treatment. The underdrain will discharge to a catch basin structure. An above grade inlet grate is intended to provide discharge for overflow during large storm events.

The southeast section of the Site within the limit of disturbance, but outside the grading area, will be restored to pre-existing conditions.

A proposed storm drain system beginning at a catch basin within the yard will follow the fence perimeter to the south and west where it will intercept a catch basin structure within the grassed, underdrained soil filter. Discharge is proposed to an existing manhole adjacent to Forest Ave which ultimately drains to the City of Portland's new, separated storm drain system.

2.0 HYDROLOGY & HYDRAULICS

2.1 Hydrology

Paramount to the continued development and improvement of the City of Portland, the published *Portland's Plan 2030* includes a policy guide section concerning the Environment, and specifically the improvement of water quality. A major initiative in the City has been underway to separate sanitary and storm sewer systems. From correspondence with the City's Department of Public Works, the City in recent years has completed the State Street & Marginal Way Sewer Separation project.

A major, 84-inch conduit crosses Forest Ave, continues north of the Site, and discharges to Back Cove. Survey information from the project indicates existing storm drains in the vicinity of the Site ultimately discharge to this system.

In developing the sewer separation project, and as evident in Appendix I, titled "Subcatchment Areas Map" for the "State Street & Marginal Way Sewer Separation", a "weighted C", presumably a rational method runoff coefficient, was assigned as 0.88 for the parcel containing the Site. This value implies the Site as wholly impervious. It is assumed this decision was made in the design process to conservatively size the drainage system for future development.

A formal examination of pre-development vs. post-development flows is not warranted because the drainage system is sized for a future increase in impervious area. Nevertheless, as described herein, best practices were maintained to limit impervious areas and provide treatment and detention of runoff.

2.2 Hydraulics

Runoff calculations were completed using the Rational Method according to *Maine Stormwater Management Design Manual, Technical Design Manual Volume III, May 2016, Appendix A-1*.

Runoff coefficients were selected from the table: *Runoff Coefficients for the Rational Formula by Hydrologic Soil Group and Slope*. While no hydrologic soil groups are assigned to the Site, Group D was assumed as a conservative estimate. The "impervious" area coefficient of 0.69 was chosen for *Industrial land use, 0-2% slopes*, representing the substation yard, driveway, and control house. The "grassed" area coefficient of 0.21 was chosen for *Open Space land use, 2-6% slopes*, representing the area outside of the yard stone and driveway.

Rainfall intensity calculations are based on an assumed time of concentration of 10 minutes input into Rainfall Intensity – Frequency -Duration charts from <http://precip.eas.cornell.edu> for the 10-year 24-hour design storm, as required by the Stormwater Management Design Manual for storm drains.

A proposed runoff area figure and peak flow calculations are available in Appendix D.

The Hydraflow Storm Sewers Extension for Autodesk Civil 3D was used in modeling the storm drain system hydraulics as presented in Appendix D. Peak runoff flows for both drainage sub areas were input within the model. Resulting flows indicate the system has more than adequate capacity to convey the 10-year event.

3.0 MAINE DEP STANDARDS

While the Project will result in less than one acre of developed area, the threshold to trigger Maine DEP Chapter 500 *Stormwater Management* regulations, the *City of Portland Technical Manual* in accordance with Chapter 32 of the City Code of Ordinances requires a stormwater management plan for site alteration which will result in the creation of more than 1,000 square-feet of new impervious area. Therefore, this project must meet the following Basic, General, Flooding, and Discharge to Public Storm Sewer Systems standards per Maine DEP Chapter 500:

3.1 Basic Standards

3.1.1 Erosion and Sedimentation Control

Appendix E contains the manual “Central Maine Power Company Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects”. The manual addresses general erosion and sedimentation control measures used by CMP and has been reviewed and approved by Maine DEP. The manual was developed to be consistent with the Maine Erosion and Sediment Control Practices Field Guide for Contractors and Maine DEP Chapter 500.

Specific erosion and sedimentation control BMPs for the Project are indicated on drawings 548-0003-005 SH 001 through SH 003 Erosion Control and Details, included for reference in Appendix F. Erosion and sedimentation control BMPs will be implemented at the Site prior to demolition, clearing, construction or any other land disturbance activities. Erosion and sedimentation controls are to remain in working order for a full growing season after construction activities cease, and until the Site is stabilized.

3.1.2 Inspection and Maintenance

CMP shall ensure that a person with knowledge of erosion and stormwater control, including the Maine DEP standards, conduct inspections during construction. Inspections shall cover disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter and exit the Site. Inspections shall occur at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. An inspection and maintenance schedule for each erosion and sedimentation control measure is included on drawing 548-0003-005 SH 003. Refer to Appendix I for the Project’s Operation and Maintenance Plan.

Maintenance shall be performed on an as-needed basis and will include the immediate repair of eroded channels or gullies; reseeding or sodding of bare ground; removal of trash, leaves and sediment; and control

of vegetation. Disposal of all sediment, debris and waste shall be in accordance with Maine Solid Waste Management Rules, Chapter 400.

3.2 General Standards

3.2.1 Treatment Measures

The Project must provide treatment of no less than 95% of the impervious area and no less than 80% of the developed area to meet Maine DEP treatment requirements. For the purposes of determining the level of permitting and treatment required, the substation yard is treated as impervious area. Grassed areas outside of the substation yard and driveway are not anticipated to be mowed more than twice per year, and therefore, are not considered new developed areas. However, in sizing treatment measures, it was assumed contributing vegetated areas are “landscaped” and consequently developed per Maine DEP definitions, thereby maximizing the designed treatment capability of the BMPs.

Table 3-1 summarizes the Project’s impervious areas and consequential treatment BMPs. Refer to Appendix H for the Project’s Water Quality Plan figure and BMP sizing calculations.

Table 3-1: Maine DEP Treatment BMP Summary

Description	Impervious Area (SF)	Percent of Total Impervious Area	Treatment BMP
Substation Yard and Roof within Containment Berm	13,230	69.9%	Substation Yard Section w/ Overflow to Storm Drain System w/ Sumps
Substation Yard, Other Roof Area, Part of Driveway	3,883	20.5%	Grassed Underdrained Soil Filter w/ Overflow to Storm Drain System w/ Sumps
Substation Yard Outside Containment Berm	1,829	9.7%	Substation Yard Section
Driveway, Sidewalk, Roadway	2,942	N/A	Exempt per Maine DEP Chapter 500, Section 4, Subsection C, 5(g)
Percent of Total Impervious Area Treated		100%	

3.2.2 Substation Yard Section

Impervious yard sections as specified by CMP are considered a BMP as approved by the Maine DEP per a letter to CMP, attached in Appendix H.

Water quality requirements are met by the section's material properties and dimensions. Impervious areas present within the yard increase the required water quality treatment volume; however, the available storage volume of the yard section's 6-inch stone surface course exceeds the required volume. By providing an adequately sized storage area for the water quality volume, discharge to the drainage system is avoided allowing for the water quality volume to evaporate and infiltrate through the underlying soil layer, achieving the General standard.

3.2.3 Grassed Underdrained Soil Filter

One grassed underdrained soil filter will be installed to detain and treat runoff from partial areas of the substation yard outside of the containment berm, about half of the roof of the control house, and part of the driveway. Pretreatment will be accomplished by runoff flowing over a gently sloped grassed swale. The soil filter is comprised of an 18-inch thick layer of silty sand and organic material mix, surrounded by nonwoven geotextile fabric. The underdrain system consists of 4-inch perforated pipe within a 12-inch thick layer of coarse gravel underdrain material. A detail and proposed location of the grassed underdrained soil filter is shown in the plan set.

The filter has been sized to provide a treatment area that exceeds 5% of the contributing impervious area and 2% of the contributing landscaped area, as well as a volume equal to at least 1-inch over the contributing impervious area plus 0.4-inches over the contributing landscaped area. As previously mentioned, the grassed area outside of the substation yard is assumed landscaped and therefore developed to conservatively size the filter.

The contributing developed area is shown as in Figure H-1, equal to 11,657 square feet. The impervious area equals 3,883 square feet and the contributing landscaped area is 7,774 square feet. The proposed filter area (1,110 square feet) exceeds the minimum filter area (350 square feet). The proposed water quality volume (601 cubic feet) exceeds the minimum water quality volume (583 cubic feet). Water quality volume has been calculated without consideration for the additional storage capacity within the filter media and crushed stone, which would provide additional treatment. The filter has been designed to drain within 24-48 hours and provide overflow above the storage volume to a catch basin. Refer to Appendix H for BMP sizing calculations.

3.3 Flooding Standard

This Standard is not applicable because the downstream drainage infrastructure is sized for future development. See Section 2.1, Hydrology, for further explanation.

3.4 Discharge to Public Storm Sewer Systems Standard

The Project must be authorized by the City of Portland to discharge site drainage into the proposed outfall at the existing manhole on Forest Avenue. This document demonstrates the proposed peak flow rates and volumes are insignificant to negatively impact Portland's drainage system.

4.0 CONCLUSION

This stormwater management study was performed to examine the runoff resulting from the Project; construction of an electrical substation expansion, located in Portland, Maine. As described herein, the Project has been designed so that post-development drainage patterns do not increase peak flow conditions at the outfall compared to the existing site. Proposed stormwater conveyance measures have been sized in accordance with the Maine Stormwater BMP Manual. The Project is required, and adequately meets, erosion and sediment control standards, inspection and maintenance requirements, treatment measures, and discharge limits, as described in Maine DEP Chapter 500.

APPENDIX A - SITE LOCATION MAP



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



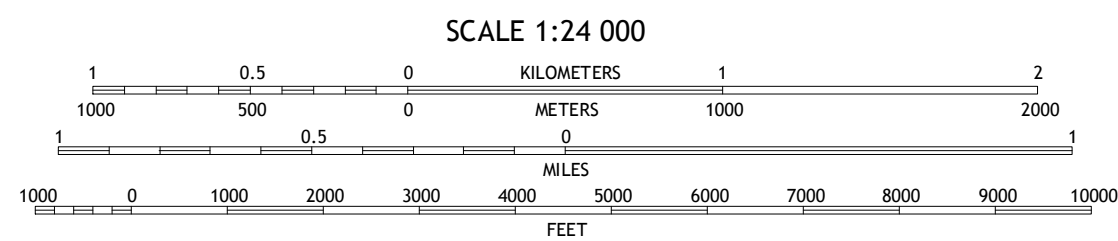
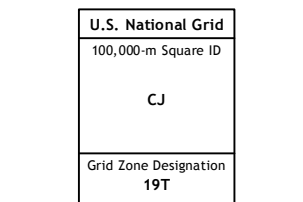
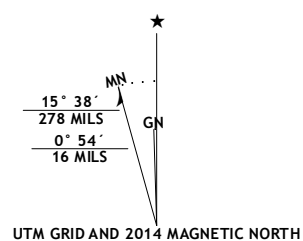
PORTLAND WEST QUADRANGLE
MAINE-CUMBERLAND CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1000-meter grid: Universal Transverse Mercator, Zone 19T
10 000-foot ticks: Maine Coordinate System of 1983 (west zone)

This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NAIP, October 2013
Roads.....HERE, ©2013
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2013
Contours.....National Elevation Dataset, 2012
Boundaries.....Multiple sources; see metadata file 1972 - 2013



CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16



QUADRANGLE LOCATION

ROAD CLASSIFICATION	
Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
	State Route

1	2	3
4	5	6
7	8	9

1 North Windham
2 Cumberland Center
3 Yarmouth
4 Gorham
5 Portland East
6 Old Orchard Beach
7 Prouts Neck
8 Cape Elizabeth

PORTLAND WEST, ME
2014

7643016370412
NSN 7643016370412
NGA REF NO. USGS X 24 K 364 12

APPENDIX B – FEMA FIRM



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 driveway 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. Profenna 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 Arian'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 Arian'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, 39.0 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.

¹National Geodetic Vertical Datum of 1929

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**
Elevation Reference Mark
Zone D Boundary
River Mile

ZONE B
ZONE A1
ZONE A5
ZONE B

573
(+L 987)
RM7x
+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 28, 1977

FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 11, 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) 636-6620.

APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

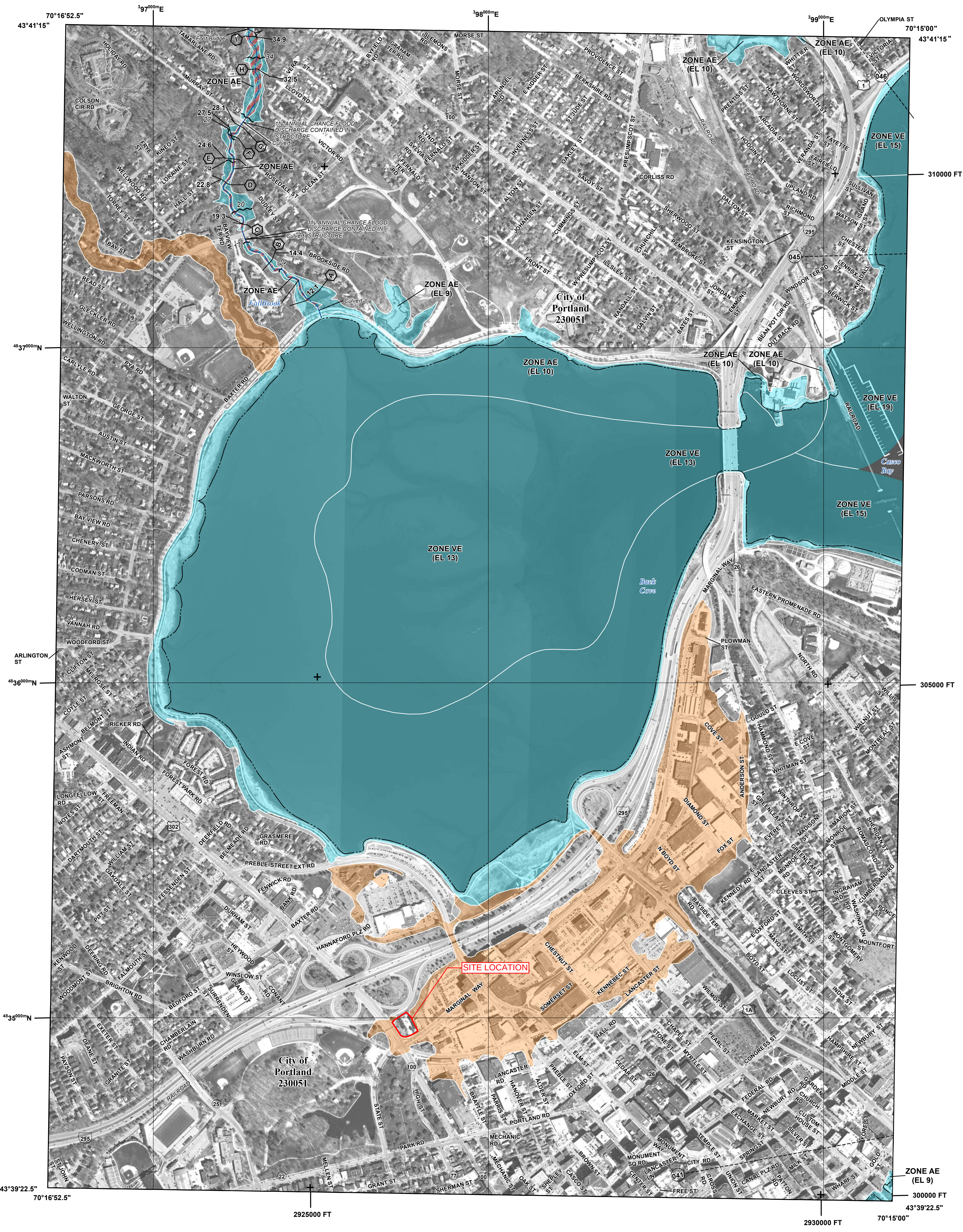
CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

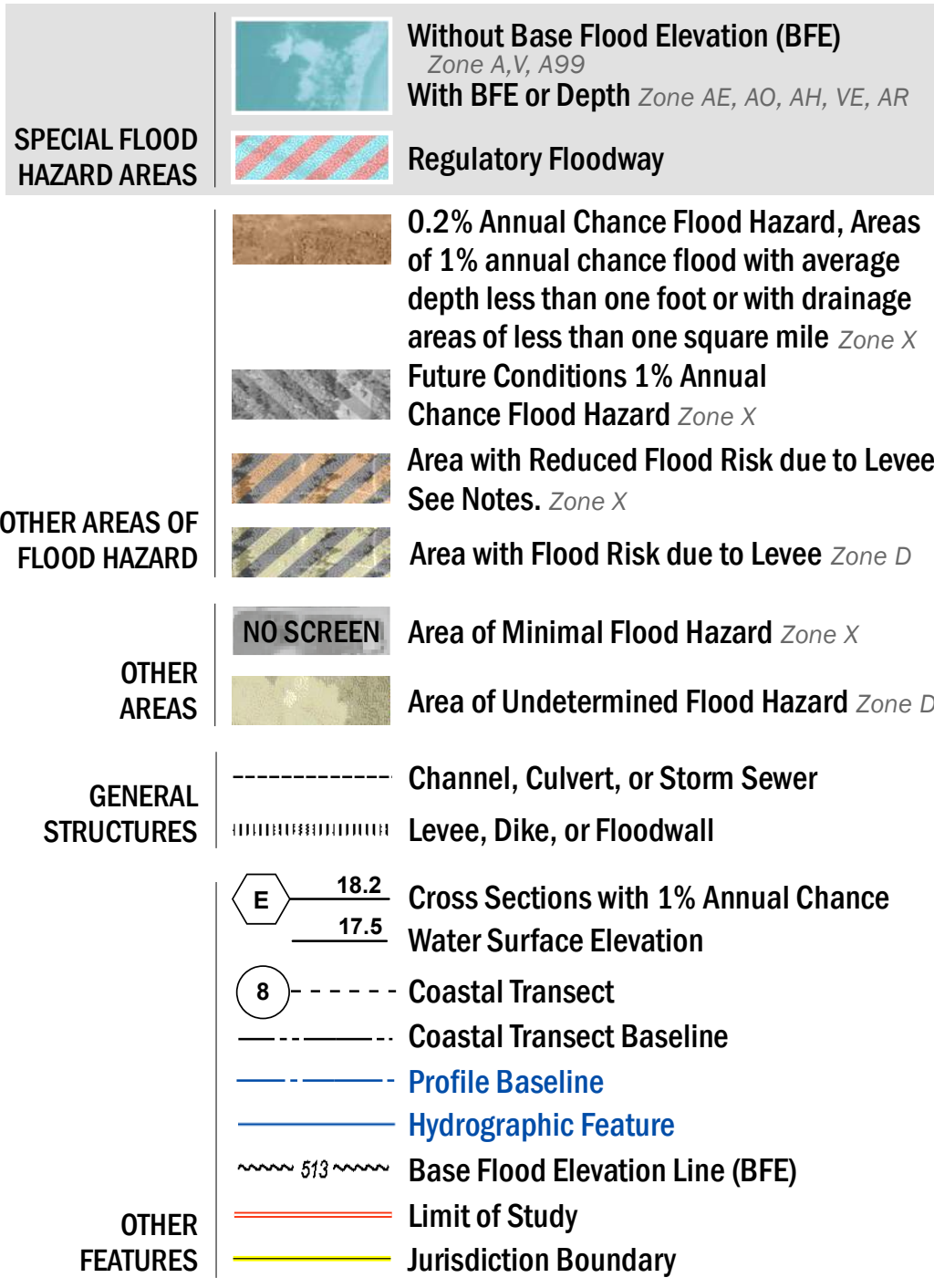
EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://MSC.FEMA.GOV](http://msc.fema.gov)



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

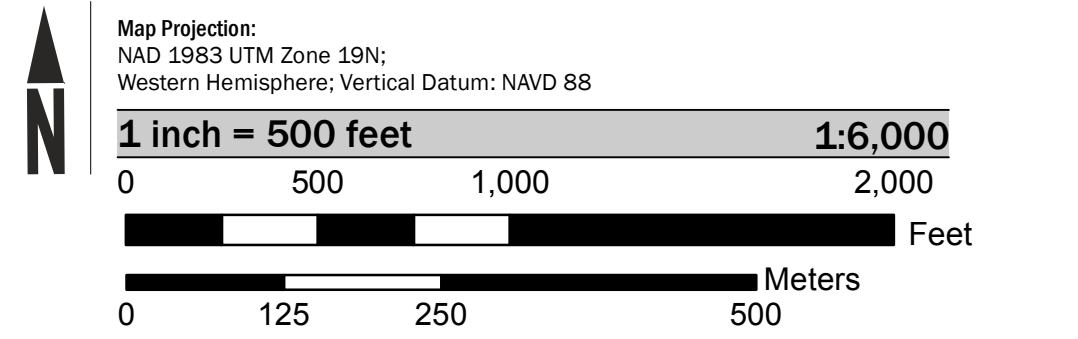
For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

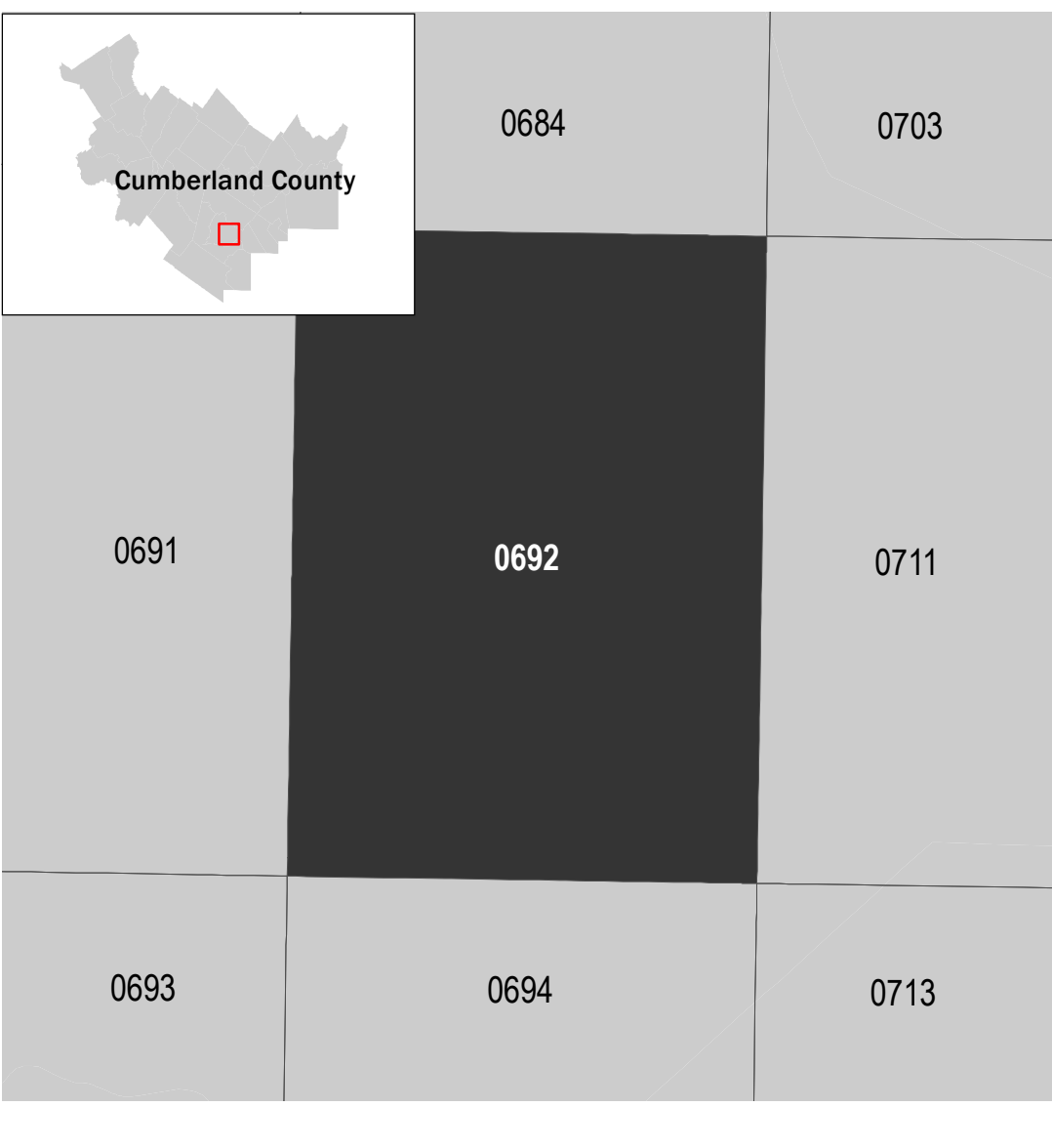
Basemap information shown on this FIRM provided in digital format by State of Maine, Maine office of GIS (MeGIS). This information was derived from MeGIS, dated 2012.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and FDTs may reflect stream channel distances that differ from what is shown on the map.

SCALE



PANEL LOCATOR



National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

CUMBERLAND COUNTY, MAINE
All Jurisdictions

PANEL **0692** of **0837**

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTLAND, CITY OF	230051	0692	F

REVISED PRELIMINARY
4/14/2017

VERSION NUMBER
2.3.2.1

MAP NUMBER
23005C0692F

EFFECTIVE DATE

APPENDIX C – SOILS INFORMATION



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**

SubMod - Forest Avenue Site



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.

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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

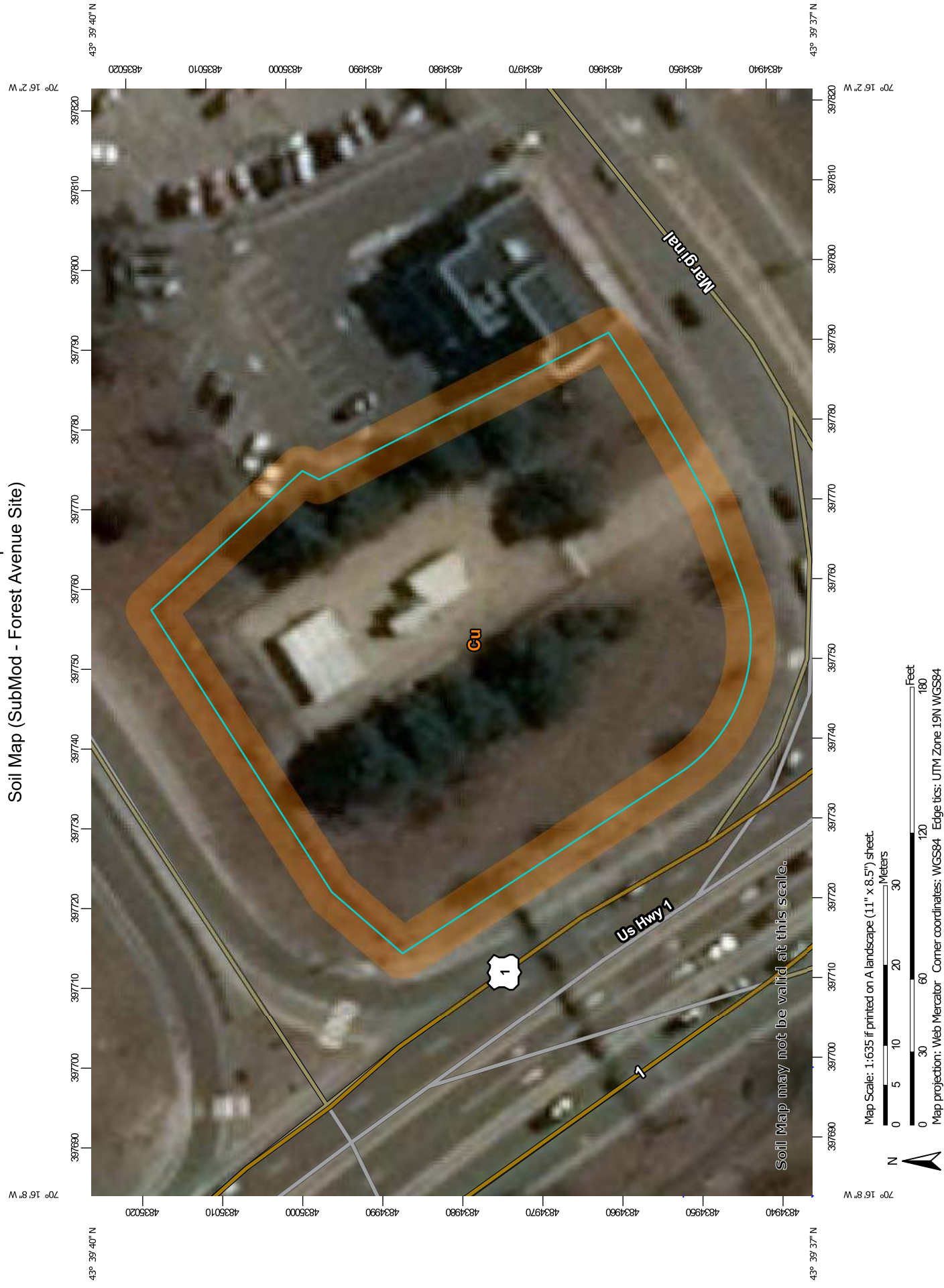
Custom Soil Resource Report

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.

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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

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

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 13, Sep 11, 2017

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 (SubMod - Forest Avenue Site)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cu	Cut and fill land	0.9	100.0%
Totals for Area of Interest		0.9	100.0%

Map Unit Descriptions (SubMod - Forest Avenue Site)

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

Custom Soil Resource Report

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 Composition

Cut and fill land: 90 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)

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Geotechnical Engineering Report

**Iberdrola Central Maine Power Substation Modernization Project
Forest Avenue - Portland, Maine**

June 19, 2018

Terracon Project No. J1175119

Prepared for:

Burns & McDonnell, Inc.
Wallingford, CT

Prepared by:

Terracon Consultants, Inc.
Manchester, NH

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

June 19, 2018

Burns & McDonnell, Inc.
108 Leigus Road
Building A, Suite 1100
Wallingford, CT 06492



Attn: Mr. Lance Pylko, PE
P: (203) 949 2392
E: lhpylko@burnsmcd.com

Re: Geotechnical Engineering Report
Iberdrola Central Maine Power Substation Modernization Project
Forest Avenue - Portland, Maine
Terracon Project No. J1175119

Dear Mr. Pylko:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PJ1140195 dated October 20, 2017. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning design and construction of foundations for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

A handwritten signature in dark ink, appearing to read "Anant Panwalkar".

Anant Panwalkar
Senior Project Engineer

Lawrence J. Dwyer, P.E.
Principal



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Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the  logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

SITE LOCATION AND EXPLORATION PLANS

EXPLORATION RESULTS (Boring Logs, Laboratory Data)

SUPPORTING INFORMATION (General Notes and Unified Soil Classification System)

Geotechnical Engineering Report
Iberdrola Central Maine Power Substation Modernization Project
Forest Avenue - Portland, Maine
Terracon Project No. J1175119
June 19, 2018

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the improvement of existing substation located on Forest Avenue - Portland, Maine. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Soil laboratory testing
- Site preparation and earthwork
- Foundation design and construction
- Lateral earth pressures
- Evaluation of liquefaction potential
- Seismic site classification per IBC

The geotechnical engineering scope of services for this project included the advancement of four test borings to approximately 30 feet deep below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the the field exploration are included on the boring logs in the **Exploration Results** section of this report.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at the intersection of Forest Avenue and Marginal Way in Portland, Maine. See Site Location
Existing Improvements	Existing operational substation surrounded by a grassed area and partially wooded.
Current Ground Cover	Landscaped grass area, and wooded. Asphalt driveway access from the southeast end of the property.

Geotechnical Engineering Report

Iberdrola Central Maine Power Substation Modernization Project ■ Forest Avenue - Portland, Maine

June 19, 2018 ■ Terracon Project No. J1175119

Item	Description
Existing Topography	Fairly level area at approximately elevation (El) 12 feet (data obtained from Google Earth Pro application).

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. Values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials used for project construction.

Corrosivity Test Results Summary						
Boring	Sample Depth (feet)	Soil Description	Soluble Sulfate in Soil (percent by mass)	Soluble Chloride (mg/kg)	Electrical Resistivity (Ω-cm)	pH
B-3	1-5	Poorly graded Sand, light brown (FILL)	0.0211	103	2,474	10.8

■ mg/Kg = parts per million (ppm)

Soluble sulfate testing results indicate a low sulfate exposure in the soil (Exposure Class S0) when classified in accordance with Table 19.3.1.1 – Exposure Categories and Classes of the ACI 318–14 Manual of Concrete Practice. Concrete should be designed in accordance with the provisions of the ACI 318, Chapters 19 and 26.

For structural elements, when the chloride concentration is less than 500 mg/kg (ppm), the soil may be considered as having low corrosion potential for buried steel structures. The chloride concentration test results indicate a low corrosion potential.

For structural elements, the minimum resistivity of soil and/or water indicates the relative quantity of soluble salts present in the soil or water. In general, a minimum resistivity value for soil and/or water less than 1,000 ohm-cm indicates the presence of high quantities of soluble salts and a higher propensity for corrosion. The resistivity test results indicate a low corrosion potential.

The presence of high acidity, pH of 5.5 or less, in soil or water is also considered a corrosive condition. Soil or water with a pH of 5.5 or less can react with the lime in concrete to form soluble reaction products that can easily leach out of the concrete. The soil pH test results indicate mildly alkaline conditions.

PROJECT DESCRIPTION

Item	Description
Information Provided	Drawings prepared by Burns & McDonnell, Inc. dated October 2017.
Project Description	The project will include phased demolition of the existing facility with construction adjacent and within the existing substation. The existing substation will be operational during construction of the control house.
Proposed Structures	Proposed substation will include a 2,500 square feet control house with an 8 feet deep basement, two transformer pads, riser structures and a precast manhole. The transformer pads will be approximately 8 to 10 feet wide by 12 to 15 feet long. Cast-in-place oil containment pits, approximately 4 feet deep, will be built around the transformer pads. The facility will support a 13 to 34 KV system with concrete duct banks carrying cables between the control house and transformer pads. Up to two utility poles will be constructed for the proposed distribution line connection. All structures including transmission line poles are anticipated to be supported on shallow footings. Riser structure foundations will be constructed on natural subgrade at the bottom of existing fill deposit. Transformer pads will most likely be supported on mat foundations.
Maximum Loads	Preliminary foundation loads were provided by Burns and McDonnell and are as follows: · Riser Structure, going from Overhead to Underground – - o Axial = 9 kips - o Shear = 12 kips - o Moment = 360 kip-feet · Transformer Pads - - o Weight = 81 kips - o Foundation Slab = 10 ft x14 ft. mat will be approximately 4 ft thick. Top of mat approximately 6 inches above grade. - o Oil Containment will be a concrete basin, about 4 ft below grade. · Control House/Switch Gear- - o Column loads = 95 kips. Duct banks will be concrete encased conduits.
Below Grade Structures	A full basement is planned for the control house with top of basement slab approximately 10 feet below the first floor slab.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

We have developed a general characterization of the subsurface soil and groundwater conditions based upon our review of the data and our understanding of the geologic setting and planned construction. The following table provides our geotechnical characterization.

Stratum	Approximate Depth to Bottom of Stratum ¹	Material Description	Consistency/Density
Surface	5 to 9 inches	Topsoil	N/A
1	8.5 to 13 feet	FILL: Poorly Graded Sand, trace gravel to Sand with Silt, occasional brick rubble, light brown to brown	N/A
2	15 to 20 feet	Silt with Sand (ML) with shells, gray	Loose to medium dense
3	>32 feet	Lean Clay (CL) with shells, gray	Soft to stiff
1. Below ground surface			

Conditions encountered at the boring locations are indicated on the boring logs shown in the **Exploration Results** section and is attached to this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Groundwater Conditions

The boreholes were observed while drilling and after completion for the presence and level of groundwater. The water levels observed in the boreholes can be found on the boring logs in **Exploration Results**, and are summarized below.

Boring Number	Approximate Depth to Groundwater while Drilling (feet) ¹	Approximate Groundwater Elevation (feet)
B-1	9.0	4.0
B-2	12.5	0.5
B-3	9.0	3.0
B-4	8.0	3.0
1. Below ground surface		

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater

levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

In-Situ Soil Resistivity

One in-situ soil resistivity test was performed at the site. We have summarized the results of the in-situ soil resistivity testing in the table below, and included the field data sheets in **Exploration Results**.

Electrode Spacing (ft.)	Electrical Resistivity (Ω -m)	
	Line 1 (N-S)	Line 2 (E-W)
2	871	759
5	588	863
10	237	284
20	52	76
40	24	11

Notes: Line 1 Center Point: 43.66061, -70.26821
Line 2 Center Point: 43.66067, -70.26795

Field resistivity values may vary depending upon the season, precipitation, and temperature, and subsurface factors such as variations in soil density and degree of compaction, presence of coarse gravel and cobbles, and soil constituent solubility which may be different from those at the time of testing. Field resistivity values should be evaluated based on the measured data in conjunction with published values for the material.

GEOTECHNICAL OVERVIEW

The Forest Avenue Substation site has been filled in an uncontrolled manner. The fill encountered in the borings is typical of urban fill, containing varying amounts of brick, organic matter, and processed wood fibers in a dark brown sand with silt and gravel matrix. The fill is prone to excessive settlement under the weight of foundations or additional fill, and is considered unsuitable to support the proposed development. The unsuitable fill extends below the observed groundwater level in most of the borings. Fill thickness varied from 8.5 feet below ground surface (bgs) in B-4 to 13 feet bgs in B-3.

Proposed development may be supported on shallow foundations supported on compacted Granular Borrow after removal of existing urban fill. The **Shallow Foundations** section addresses

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support of the proposed riser structures on a shallow spread footing bearing on compacted Granular Borrow or on in-situ improved fill. The **Ground Improvement** section includes discussion on commonly used ground improvement techniques for faster construction, avoiding dewatering, and reducing spoil. It is understood the speciality contractor will develop final design for ground improvement to meet project needs. Alternately, the riser structures may be supported on drilled shafts extended below the fill deposit into natural soil. The **Deep Foundations** section addresses support of the riser structures on drilled shaft foundations.

The **Reinforced Concrete Mat** section addresses support of the control house and transformer pads by a mat foundation bearing on compacted Granular Borrow.

Geotechnical engineering recommendations for foundation systems and other earth-connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field testing, engineering analyses, and our current understanding of the proposed improvements and preliminary grading at the site. Whereas the site development concept has not been finalized, Terracon should be retained to review the final grading plans for continued applicability of the recommendations presented herein.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

The following presents recommendations for site preparation, soil excavation, subgrade preparation, and placement of fill for the project. The recommendations presented for design and construction of earth supported elements including foundations are contingent upon following the recommendations outlined in this section.

Terracon representatives should observe and evaluate the earthwork on the project. The earthwork evaluation should include monitoring the performance of construction dewatering, subgrade preparation, foundation preparation, foundation bearing soils, slope stabilization, and other geotechnical conditions exposed during construction

Site Preparation

Debris, woody vegetation, existing organic surficial soil and unsuitable fill should be removed from foundation bearing zones (defined as the area beneath 1H:1.5V lines extending downward and outward from footing edges). Suitable bearing subgrades consist of proof-rolled native soils, or compacted Granular Borrow. Fill materials and compaction efforts should be consistent with the intended future use.

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Fill Material Types

Excavated on-site soils are anticipated to consist primarily of urban fill, which is not suitable for re-use on-site. Fill used for the project should meet the following material property requirements:

Fill Type ¹	Maine Department of Transportation (MDOT) Item	Acceptable Location For Placement
Gravel Borrow	703.20 – Gravel Borrow	Raise-in-grade fill in general yard area
Granular Borrow	703.19 – Granular Borrow	Beneath foundations.
Crushed Stone	703.22 – Underdrain Backfill Material, Type C	Backfill of undersdrains and over wet subgrades as needed.

1. Compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used. Fill should not be placed on frozen subgrade.

Fill Compaction Requirements

Item	703.19 - Granular Borrow
Fill Lift Thickness	6 to 12 inches in loose thickness, depending on size and type of compaction equipment such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compacting equipment.
Compaction Requirements ^{1,2}	95% Modified Proctor maximum dry density (ASTM D1557, Method C)
Moisture Content – Granular Material	+/-3% of optimum

1. We recommend testing engineered fill for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested, as required, until the specified moisture and compaction requirements are achieved. .

Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction.

Perimeter slopes may be required where proposed cut and fill tie into existing site grades. A properly constructed soil slope of 3H:1V, using Gravel Borrow that is placed and compacted in accordance with the recommendations presented in this report is considered stable. Slopes

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should be adequately vegetated or armored with stone fill for permanent erosion control protection.

Earthwork Construction Considerations

Based on ground water levels encountered during drilling, dewatering is anticipated during construction of the control house basement as well as excavation and replacement of existing fill underneath riser structures and transformer pads. We anticipate the need for multiple filtered sump pumps in the excavation to maintain a stable condition. Installation of the drilled shaft will likely require construction in the wet.

Efforts should be made to prevent surface water runoff from collecting in excavations. Subgrade soils that become unstable should be replaced with compacted Granular Borrow or Crushed Stone, as necessary. Crushed Stone, if used, should be underlain with a geotextile filter fabric such as Mirafi 140N, or equivalent.

If foundation construction takes place during freezing conditions, foundations and floor slabs must be protected during freezing conditions. Concrete and new soil must not be placed on frozen soil and once placed, should be protected from freezing. Soils that become frozen shall be removed prior to placing additional fill or placing concrete.

As a minimum, temporary excavations should be sloped or braced as required by Occupational Health and Safety Administration (OSHA) regulations to provide stability and safe working conditions. The contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.

The Geotechnical Engineer should be retained during the construction phase of the project to observe earthwork and perform tests during subgrade preparation; review the suitability of bearing subgrades; monitor the placement and compaction of controlled compacted fills; and observe the backfilling of excavations into the completed subgrade and just before construction of foundations.

SHALLOW FOUNDATIONS

Spread Footing Design Recommendations

The proposed riser structures may be supported on conventional spread footing foundations bearing on compacted Granular Borrow placed on proofrolled natural soil. Design

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recommendations and construction considerations for spread footings are presented in the following sections.

Foundation Design Recommendations

Description	Value
Bearing Material	Compacted Granular Borrow over native material
Net Allowable Bearing Pressure ⁽¹⁾	3,000 psf
Minimum Footing Width	36 inches
Minimum Embedment below Finished Grade for Frost Protection	48 inches
Approximate Total Settlement ⁽²⁾	<1 inch
Total Unit Weight (γ) (Fill and Natural Deposit)	120 pcf
Passive Earth Pressure Coefficient, K_p ⁽³⁾	3.0 (ultimate)
Coefficient of Sliding Friction ⁽⁴⁾	0.5 (ultimate)

1. The recommended net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. The factor of safety for allowable soil bearing pressure is 3. See **Ground Improvement** section for discussion of achieving a higher allowable soil bearing pressure.
2. Foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footing, the thickness of compacted fill, and the quality of the earthwork operations.
3. Passive pressure calculated with this parameter should be reduced by at least a factor of safety of 3 to reflect the amount of movement required to mobilize passive resistance. We anticipate approximately ¼ inch lateral movement of the foundation would be required to develop passive resistance at a factor of safety of 3.
4. A factor of safety of at least 1.5 should be applied to the sliding resistance.

Uplift forces can be resisted by the dead weight of the footing and the effective weight of soil above the footing. For design purposes assume a unit weight of soil not exceeding 120 pounds per cubic foot (pcf) for soils backfilled above the foundation, assuming it is compacted to at least 95 percent of Modified Proctor maximum dry density (ASTM D 1557, Method C). A unit weight of 150 pcf should be used for reinforced concrete.

Foundation Construction Considerations

The base of foundation excavations should be free of water and loose material before placing Granular Borrow. Concrete should be placed soon after placement of compacted Granular Borrow to reduce bearing soil disturbance. If the soils at bearing level become wet, disturbed, or frozen, the affected soil should be removed before concrete placement.

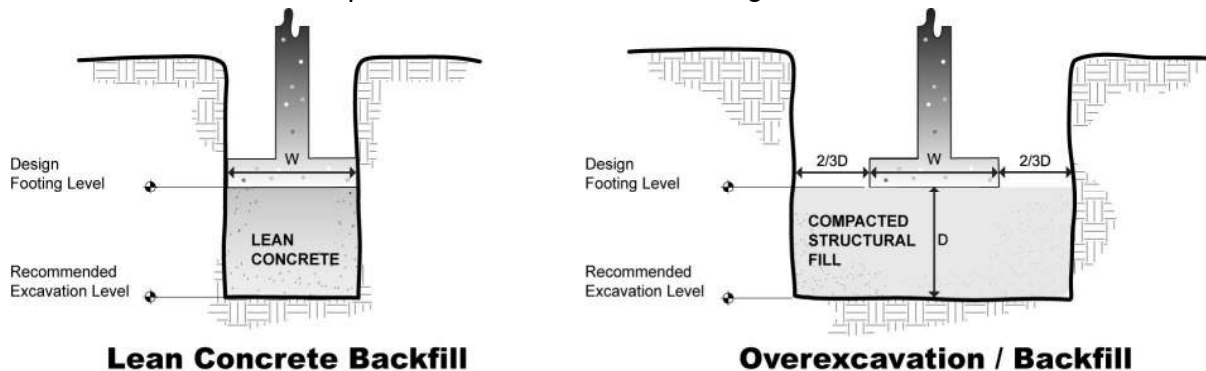
If unsuitable bearing soil is encountered in footing excavations, the excavations should be extended deeper to suitable soil and Granular Borrow, or Crushed Stone placed. Overexcavation

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for compacted Granular Borrow placement below footings should extend laterally beyond all edges of the footings at least 8 inches per foot of overexcavation depth below footing base elevation. The overexcavation should then be backfilled up to the footing base elevation with Granular Borrow placed in lifts of 8 inches or less in loose thickness and compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557, Method C). The overexcavation and backfill procedure is described in the figure below.



The contractor should be required to maintain a stable subgrade during construction. The contractor should prevent groundwater, if encountered, and surface water runoff from collecting in the excavation. Subgrade soils that become unstable because of water and/or reworking by construction activity should be replaced with compacted Granular Borrow or Crushed Stone, as necessary.

REINFORCED CONCRETE MAT

Two transformer pads and the control house will be supported on mats, constructed near the finished grade. Design parameters for mats assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structures. This also includes the positive drainage of the aggregate base beneath the mat.

Design Parameters

Item	Description
Mat Support ¹	Compacted Granular Borrow.
Allowable Bearing Capacity,ksf ²	3.0
Modulus of Subgrade Reaction ³	200 pounds per square inch per inch (psi/in)

1. Slabs should be structurally independent of connecting concrete conduits to reduce the possibility of cracking caused by differential movements between the slab and conduit.
2. Allowable bearing capacity developed using factor of safety of 3.0.

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Item	Description
3.	Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in Earthwork, and support as noted in this table. The modulus recommended is for compacted Granular Borrow over stiff silty clay. No adjustment is necessary for mat size..

Saw-cut control joints should be placed in the mat to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Construction Considerations

Finished subgrade within and for at least 10 feet beyond the mat should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until the mat is constructed. If the subgrade should become damaged or desiccated prior to construction of mats, the affected material should be removed and Granular Borrow should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the mat support course.

The Geotechnical Engineer should approve the condition of the mat subgrades immediately prior to placement of the support course, reinforcing steel and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

DEEP FOUNDATIONS

Drilled Shaft/Direct Embedment Design Parameters

Drilled shafts are an alternative foundation to spread footings for the riser structures. Soil design parameters are provided below in the **Drilled Shaft Design Summary** table for the design of drilled shaft foundations using LPILE software. The values presented for allowable side friction and end bearing include a factor of safety.

Item ^{1, 4}	Description
Net Allowable End Bearing Capacity ² Lean Clay > 32 feet deep	Not Applicable ³
Estimated In-Situ Soil Total Unit Weight Lean Clay	115 pcf
Cohesion Lean Clay	445 psf

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Item ^{1, 4}	Description
Angle of Internal Friction Lean Clay	0 degrees
Approximate Water Depth	8.0 feet
Ultimate Adhesion Resistance ² Lean Clay	450 psf
1. Design capacities are dependent upon the method of installation, and quality control parameters. The values provided are estimates and should be verified when installation protocol have been finalized. 2. Contribution to shaft capacity from the existing fill should be ignored. 3. End bearing capacity shall be ignored in the clay layer. 4. Design capacities can be increased by 33% for highly transient loads. .	

Tensile reinforcement should extend to the bottom of shafts subjected to uplift loading. Buoyant unit weights of the soil and concrete should be used in the calculations below the highest anticipated groundwater elevation.

Bedrock was not encountered during field investigation. Therefore, drilled shafts will rely only on adhesion and should be of sufficient length to keep final settlement to less than 1 inch.

GROUND IMPROVEMENT

As an alternative to replacing the old fill with compacted Granular Borrow, the riser structure foundations could be supported on the old fill if ground improvement methods are utilized such as rammed aggregate piers (RAPs). Ground improvement methods are proprietary systems designed by licensed contractors who could provide further information regarding support options, resulting vibrations, and estimated construction costs. Increased bearing capacity as a result of ground improvement may allow design of smaller footing providing cost savings.

RAPs are a ground improvement technique that produce high lateral stresses within the surrounding soil matrix, thereby stiffening the reinforced composite soil/aggregate mass. The soil mass stiffening results in significant strengthening of the foundation bearing layer to support foundations within project settlement tolerances. Advantages associated with the RAP system include minimal spoil generated, minimal dewatering effort, and a relatively short construction schedule for installation.

RAP elements would need to be installed through the fill to the underlying clay stratum; pier lengths are anticipated to be on the order of 10 to 15 feet below existing grade. Pier elements will likely consist of 18 to 20-inch diameter open-graded stone filled holes installed using rapid impact displacement methods in order to avoid spoil. We expect the RAP system may allow spread footings to be designed for a higher allowable soil bearing pressure than what is suggested in the **Shallow Foundations** section.

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As an alternative to RAPS, it may be possible to support the riser structures on other ground improvement systems such as stone columns or rigid inclusions (RIs). Stone columns are constructed in a similar manner to RAPs except the hole can be formed with a large vibrator which forces the soil aside as it is extended into the ground thereby densifying the surrounding soils. Once the design depth is obtained, the vibrator remains in the hole and is typically lifted about 2 to 4 feet from the bottom of the hole which is filled about $\frac{1}{4}$ full with stone, often No. 67 or 57 Stone. The vibrator then penetrates the stone to the bottom of the hole and is withdrawn to about the top of the stone layer and then allowed to re-penetrate about two-thirds of the stone lift. The re-penetration process is repeated in increments between one-quarter to one-third the stone lift thickness. The remainder of the hole is filled to the existing ground surface in this manner. Stone columns are also designed and installed by specialized contractors. RIs are constructed in a manner similar to stone columns except the column is constructed using pressurized concrete/grout in lieu of stone.

The installer of either system should provide detailed design calculations sealed by a professional engineer licensed in the State of Maine. The design calculations should demonstrate the Vibropier/Geopier/RI soil improved system is estimated to control long-term total and differential settlements to that required for the project. The specialty contractor should warrant their work as well as the maximum total and differential settlements they predict. We recommend the design parameters be verified by a full-scale modulus test (similar to a pile load test) performed in the field. The Geotechnical Engineer should be retained to monitor the modulus test and subsequent production Vibropier/Geopier/RI installation.

SEISMIC CONSIDERATIONS

Description	Value
2009 International Building Code Site Classification	E
S_s Spectral Acceleration for a Short Period ³	0.315g
S_1 Spectral Acceleration for a 1-Second Period ³	0.077g
Liquefaction Potential in Event of an Earthquake	Not susceptible

1. The 2009 International Building Code (IBC) uses a site profile extending to a depth of 100 feet for seismic site classification. Borings at this site were extended to a maximum depth of 32 feet. The site classification considers that soft soil extends below the maximum depth of boring.
2. These values were obtained using online seismic design maps and tools provided by the USGS (<http://earthquake.usgs.gov/hazards/designmaps/>).

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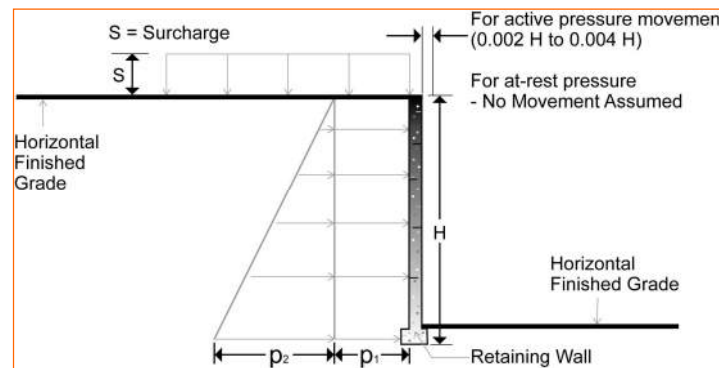
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LATERAL EARTH PRESSURES

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement and is commonly used for basement walls, loading dock walls, or other walls restrained at the top. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated).



Lateral Earth Pressure Design Parameters				
Earth Pressure Condition ¹	Coefficient for Backfill Type ²	Surcharge Pressure ^{3, 4, 5} p_1 (psf)	Effective Fluid Pressures (psf) ^{2, 4, 5}	
			Unsaturated ⁶	Submerged ⁶
Active (K_a)	Granular - 0.33	$(0.33)S$	$(40)H$	$(81)H$
At-Rest (K_o)	Granular - 0.50	$(0.50)S$	$(60)H$	$(91)H$
Passive (K_p)	Granular - 3.00	---	$(360)H$	$(235)H$

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance.
2. Uniform, horizontal backfill, compacted to at least 95 percent of the ASTM D 698 maximum dry density, rendering a maximum unit weight of 120 pcf.
3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. No safety factor is included in these values.
6. In order to achieve "Unsaturated" conditions, follow guidelines in **Subsurface Drainage for Below Grade Walls** below. "Submerged" conditions are recommended when drainage behind walls is not incorporated into the design.

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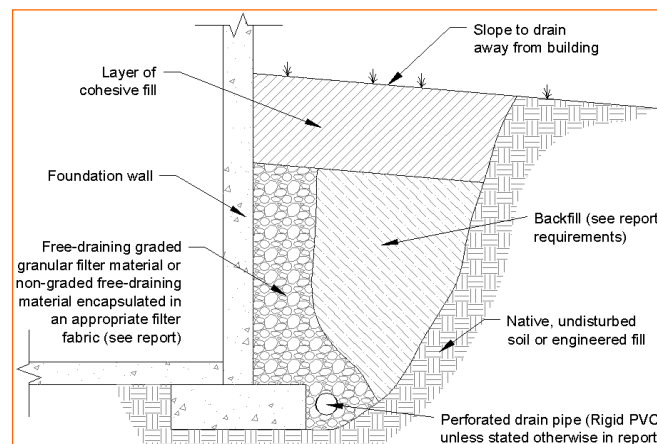
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Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively.

Subsurface Drainage for Below Grade Walls

A perforated rigid plastic drain line installed behind the base of walls and extends below adjacent grade is recommended to prevent hydrostatic loading on the walls. The invert of a drain line around a below-grade building area or exterior retaining wall should be placed near foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5 percent passing the No. 200 sieve, such as Crushed Stone. The Crushed Stone should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of final grade, where it should be capped with rigid or flexible pavement or low permeable fill to reduce infiltration of surface water into the drain system.



As an alternative to Crushed Stone, a pre-fabricated drainage structure may be used. A pre-fabricated drainage structure is a plastic drainage core or mesh which is covered with filter fabric to prevent soil intrusion, and is fastened to the wall prior to placing backfill.

GENERAL COMMENTS

As the project progresses, we address assumptions by incorporating information provided by the design team, if any. Revised project information that reflects actual conditions important to our services is reflected in the final report. The design team should collaborate with Terracon to confirm these assumptions and to prepare the final design plans and specifications. This facilitates the incorporation of our opinions related to implementation of our geotechnical recommendations. Any information conveyed prior to the final report is for informational purposes only and should not be considered or used for decision-making purposes.

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Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in the final report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third party beneficiaries intended. Any third party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

The field exploration program consisted of the following:

Number of Borings	Boring Depth (feet) ¹	Location
4	32 feet	Various substation structures

1. Below ground surface.

Boring Layout and Elevations: We used handheld GPS equipment to locate borings with an estimated horizontal accuracy of +/-10 feet. Field measurements from existing site features may be utilized. Ground elevations were obtained from Google Earth Pro application and should be considered approximate

Subsurface Exploration Procedures: We advance soil borings with a track-mounted drill rig using continuous flight augers (solid stem and/or hollow stem, as necessary, depending on soil conditions). Four samples are obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. Soil sampling is typically performed using split-barrel sampling procedures. In the split barrel sampling procedure, a standard 2-inch outer diameter split barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The samples are placed in appropriate containers and taken to our soil laboratory for testing. In addition, we observe and record groundwater levels during drilling and sampling.

Our exploration team prepared field boring logs as part of standard drilling operations including sampling depths, penetration distances, and other relevant sampling information. Field logs include visual classifications of materials encountered during drilling, and our interpretation of subsurface conditions between samples. Final boring logs, prepared from the field logs, represent the Geotechnical Engineer's interpretation, and include modifications based on observations.

Laboratory Testing

The project engineer reviews the field data and assigns various laboratory tests to better understand the engineering properties of the various soil strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

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- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM D2850 Standard Test Method for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils
- ASTM G57 Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method
- ASTM D5334 Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure
- ASTM D2435 Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

SITE LOCATION AND EXPLORATION PLANS

SITE LOCATION

CMP Substation Modernization - Portland ■ Maine

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DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: PORTLAND WEST, ME (1/1/1978) and PORTLAND EAST,
ME (1/1/1975).

EXPLORATION PLAN

CMP Substation Modernization - Portland ■ Maine
June 20, 2018 ■ Terracon Project No. J1175119C

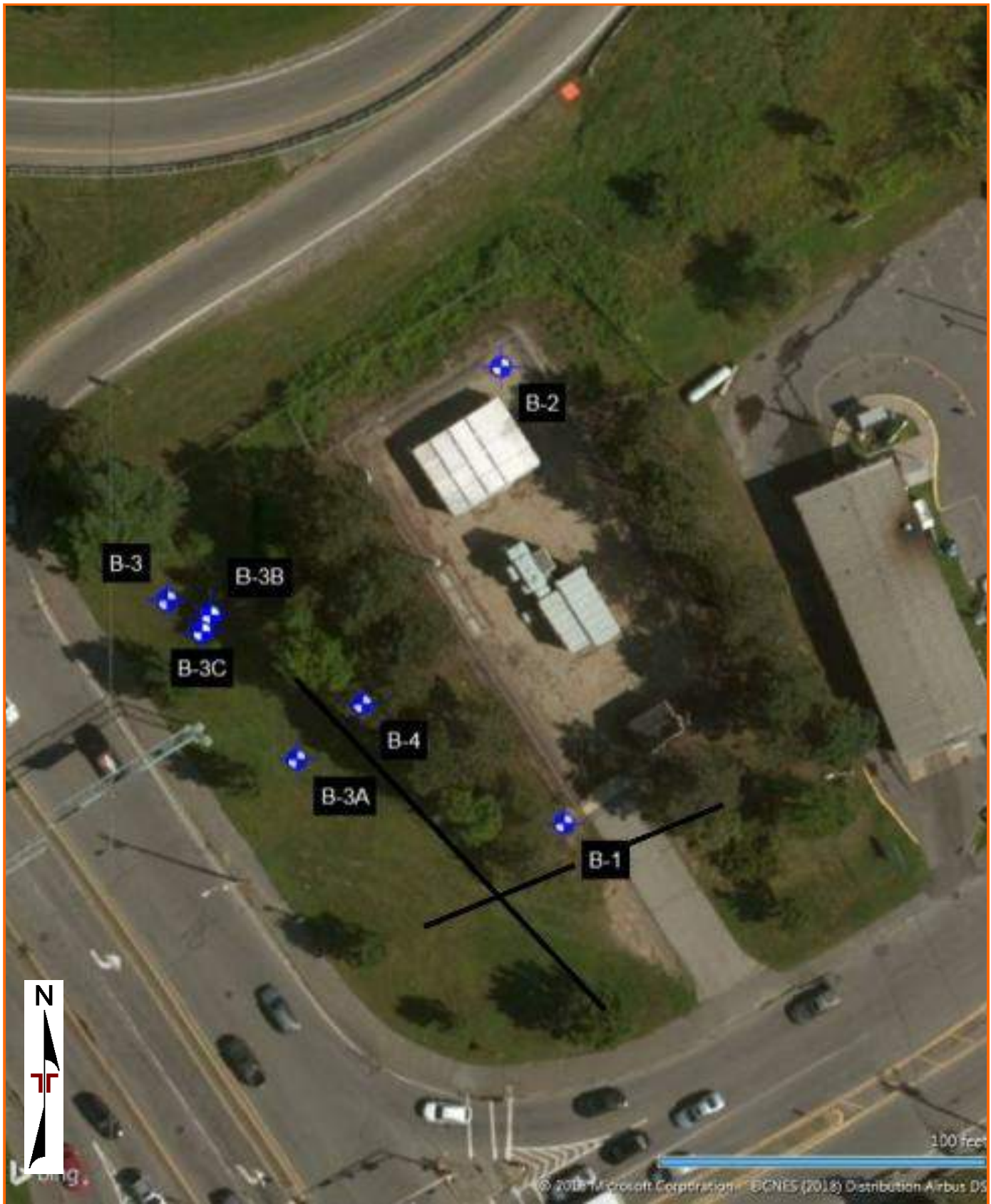


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS
NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED
BY MICROSOFT BING MAPS

EXPLORATION RESULTS

BORING LOG NO. B-1

Page 1 of 1

PROJECT: CMP Substation Modernization

CLIENT: Burns & McDonnell Engineering Company, Inc.
Wallingford, CT

SITE: Forest Avenue
Portland, ME

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1175119 CMP SUBSTATION MO.GPJ TERRACON DATATEMPLATE.GDT 1/17/18

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6607° Longitude: -70.268°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
	Approximate Surface Elev: 13 (Ft.) +/- ELEVATION (Ft.)					
0.7	3-inches of topsoil	12.5+/-			15	4-4-5-6 N=9
	FILL - POORLY GRADED SAND WITH GRAVEL , orange-brown to brown, loose to medium dense				12	9-14-15-15 N=29
		5			16	5-4-4-7 N=8
	Brick rubble observed at 10 feet				15	8-10-15-21 N=25
10.0	Auger refusal twice at 10 feet on a concrete foundation, continued borehole outside of the southwest corner of the gate	3+/-			15	2-3-2-1 N=5
	SILTY SAND WITH GRAVEL (SM) , black, loose, sheen and petroleum odor observed					
15.0		-2+/-			18	5-2-2-1 N=4
	LEAN CLAY (CL) , with sand lenses, dark gray/black, soft to stiff, slight odor					
	Similar, with shells, trace sand, no odor	20			16	7-3-1-3 N=4
		25			24	woh-1-1-1 N=2
		30			24	3-3-4-4 N=7
32.0		-19+/-				
	Boring Terminated at 32 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers, 4-inch casing

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Boring was relocated after two unsuccessful attempts.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

9' WD

Terracon
77 Sundial Ave Ste 401W
Manchester, NH

Boring Started: 12-19-2017

Boring Completed: 12-19-2017

Drill Rig: CME 850

Driller: Terracon/ Peter M.

Project No.: J1175119

BORING LOG NO. B-2

Page 1 of 1

PROJECT: CMP Substation Modernization

CLIENT: Burns & McDonnell Engineering Company, Inc.
Wallingford, CT

SITE: Forest Avenue
Portland, ME

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1175119 CMP SUBSTATION MO.GPJ TERRACON.DATATEMPLATE.GDT 1/17/18

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.661° Longitude: -70.2681°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
	Approximate Surface Elev: 13 (Ft.) +/- ELEVATION (Ft.)					
	FILL - POORLY GRADED SAND WITH GRAVEL , brown to dark brown, medium dense				12	8-7-7-7 N=14
					10	6-5-5-5 N=10
	Brick rubble and petroleum odor observed at 6 to 7.5 feet	5			17	3-5-12-11 N=17
	FILL - SILTY SAND WITH GRAVEL , with brick rubble, brown to dark brown				18	12-13-11-10 N=24
		10			20	2-5-6-4 N=11
	LEAN CLAY (CL) , with sand lenses, dark blue/gray, medium stiff		▽			
		15			8	4-3-3-1 N=6
	LEAN CLAY (CL) , with shells, blue/gray, soft				24	1-1-1-1 N=2
		20				
	POORLY GRADED SAND WITH SILT (SP-SM) , blue/gray, medium dense				14	5-6-8-9 N=14
		25				
	LEAN CLAY (CL) , gray/brown, stiff				20	3-4-5-6 N=9
		30				
	Boring Terminated at 32 Feet					
		32.0				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers, 4-inch casing

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ 12.5' WD

Terracon
77 Sundial Ave Ste 401W
Manchester, NH

Boring Started: 12-19-2017

Boring Completed: 12-19-2017

Drill Rig: CME 850

Driller: Terracon/ Peter M.

Project No.: J1175119

BORING LOG NO. B-3

Page 1 of 1

PROJECT: CMP Substation Modernization

CLIENT: Burns & McDonnell Engineering Company, Inc.
Wallingford, CT

SITE: Forest Avenue
Portland, ME

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1175119 CMP SUBSTATION MO.GPJ TERRACON.DATATEMPLATE.GDT 1/17/18

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6607° Longitude: -70.2683° Approximate Surface Elev: 12 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH						
0.8 9-inches of topsoil		11.5+/-			18	4-2-5-7 N=7
FILL - POORLY GRADED SAND , light brown, loose					12	9-11-15-35 N=26
Similar, with brick rubble and petroleum odor Offset borehole due to auger refusal on concrete at 4 feet		5				
FILL - SILT WITH SAND , dark brown, very loose					12	3-1-2-3 N=3
					3	4-1-25/0"
FILL - POORLY GRADED SAND WITH SILT , with wood pieces, dark brown, very loose, strong petroleum odor		10			6	1-1-1-1 N=2
13.0		-1+/-				
SILT WITH SAND (ML) , with shells, gray, medium dense, piece of wood in sampler		15			3	5-7-14-6 N=21
20.0		-8+/-				
LEAN CLAY (CL) , with shells, gray, medium stiff		20			12	Shelby tube sample
		25			24	Shelby tube sample
32.0		-20+/-			24	5-4-2-2 N=6
Boring Terminated at 32 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers, 4-inch casing

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:
Boring was relocated after multiple unsuccessful attempts.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

9' WD
11' AB

Terracon
77 Sundial Ave Ste 401W
Manchester, NH

Boring Started: 12-20-2017

Boring Completed: 12-20-2017

Drill Rig: CME 850

Driller: Terracon/ Peter M.

Project No.: J1175119

BORING LOG NO. B-4

Page 1 of 1

PROJECT: CMP Substation Modernization

CLIENT: Burns & McDonnell Engineering Company, Inc.
Wallingford, CT

SITE: Forest Avenue
Portland, ME

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1175119 CMP SUBSTATION MO.GPJ TERRACON DATATEMPLATE.GDT 1/17/18

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6608° Longitude: -70.2683°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
	Approximate Surface Elev: 11 (Ft.) +/- ELEVATION (Ft.)					
	DEPTH 0.4 5-inches of topsoil 10.5+/-					
	FILL - POORLY GRADED SAND , trace gravel, brown, medium dense				17	4-6-4-4 N=10
					12	4-5-9-13 N=14
	Auger refusal at 4.5 feet, offset to another location Similar, with brick rubble, brown, very loose	5			7	1-1-1-1 N=2
					12	2-4-15-30 N=19
	8.5 SILT , gray, very stiff 2.5+/-					
	10.0 LEAN CLAY (CL) , with shells, blue/gray, very soft to medium stiff 1+/-	10			10	1-1-1-1 N=2
		15			2	2-1-2-2 N=3
		20			0	woh/24"
		25			24	woh/24"
		30			19	3-3-3-3 N=6
	32.0 Boring Terminated at 32 Feet -21+/-					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
2.25-inch hollow stem augers, 4-inch casing

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

8' WD

Terracon
77 Sundial Ave Ste 401W
Manchester, NH

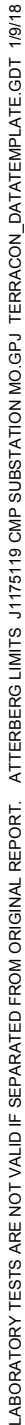
Boring Started: 12-19-2017

Boring Completed: 12-19-2017

Drill Rig: CME 850

Driller: Terracon/ Peter M.

Project No.: J1175119

ASTM D4318

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS J1175119 CMP SUBSTATION MO.GPJ TERRACON_DATATEMPLATE.GDT 1/9/18

SITE: Forest Avenue
Portland, ME

CLIENT: Burns & McDonnell Engineering
Company, Inc.
Wallingford, CT

CHEMICAL LABORATORY TEST REPORT

Project Number: J1175119

Service Date: 01/15/18

Report Date: 01/19/18

Task:

Terracon

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client

Burns & McDonnell Engineering Company, Inc.
Wallingford, CT

Project

CMP Substation Modernization

Sample Submitted By: Terracon (J1)

Date Received: 1/12/2018

Lab No.: 18-0047

Results of Corrosion Analysis

<i>Sample Number</i>	
<i>Sample Location</i>	B-3
<i>Sample Depth (ft.)</i>	1.0-5.0
pH Analysis, AWWA 4500 H	10.83
Water Soluble Sulfate (SO ₄), ASTM D 516 (mg/kg)	211
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (mg/kg)	103
Red-Ox, AWWA 2580, (mV)	+673
Total Salts, AWWA 2540, (mg/kg)	1949
Resistivity, ASTM G 57, (ohm-cm)	2474

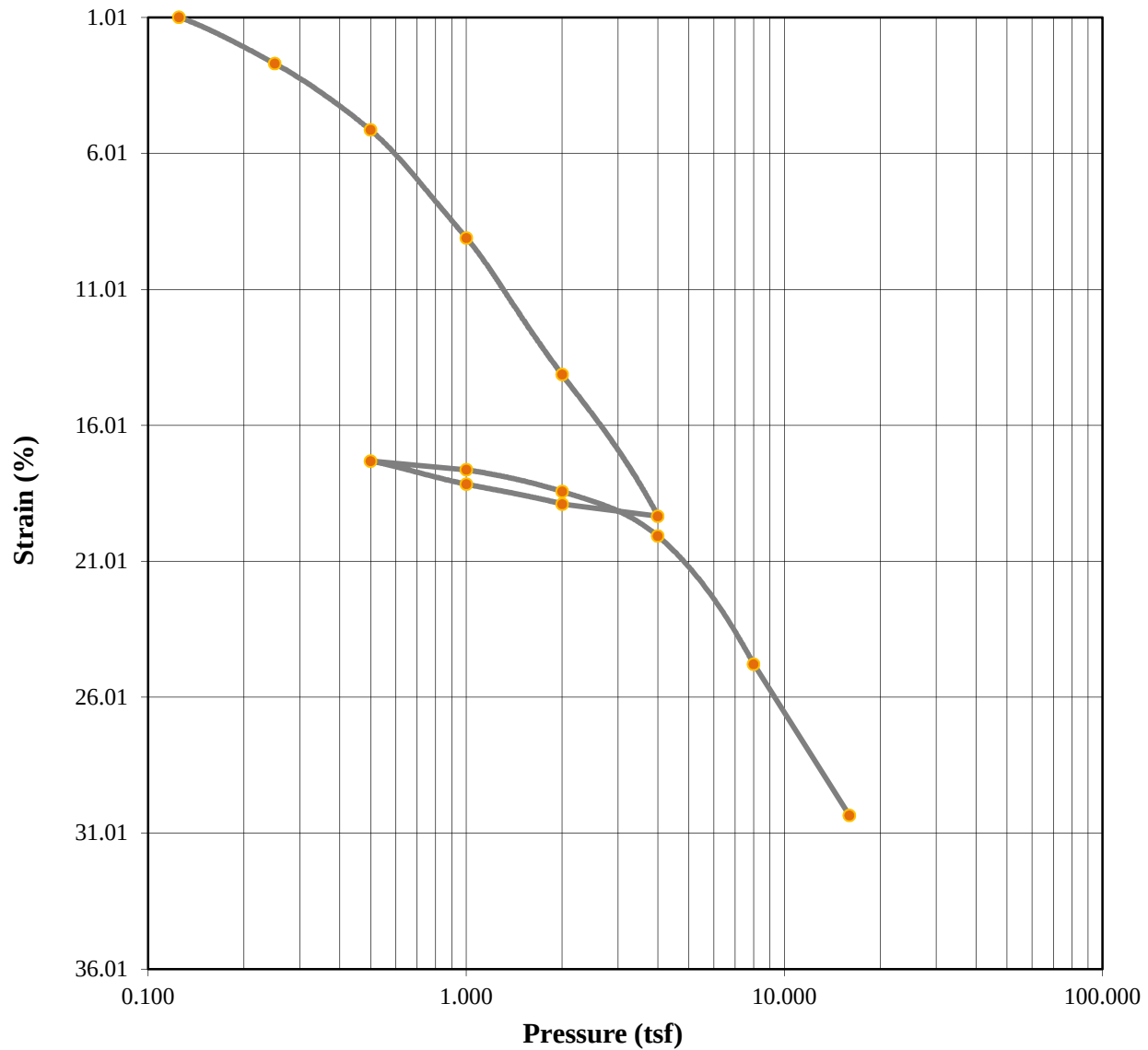
Analyzed By:



Trisha Campo
Chemist

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

Consolidation Test Test Results



	Before	After	Liquid Limits:	Test Date:	1/9/2018
Moisture (%):	53.78	32.77	Plastic Limits:		
Dry Density (pcf):	65.98	93.48	Plasticity Index (%):		
Saturation (%):	94.55	112.81			
Void Ratio:	1.5045	0.7441	Specific Gravity:	2.650	Assumed
Sample Description: Lean Clay (CL)					
Project Number: J1175119			Depth: 25'-27'		Remarks:
Sample Number: B-3			Boring Number:		
Project: CMP Substation					
Client:					
Location: Forest Ave, Portland ME					

Terracon Consultants, Inc.
Unconsolidated Undrained Triaxial Test (ASTM D2850)

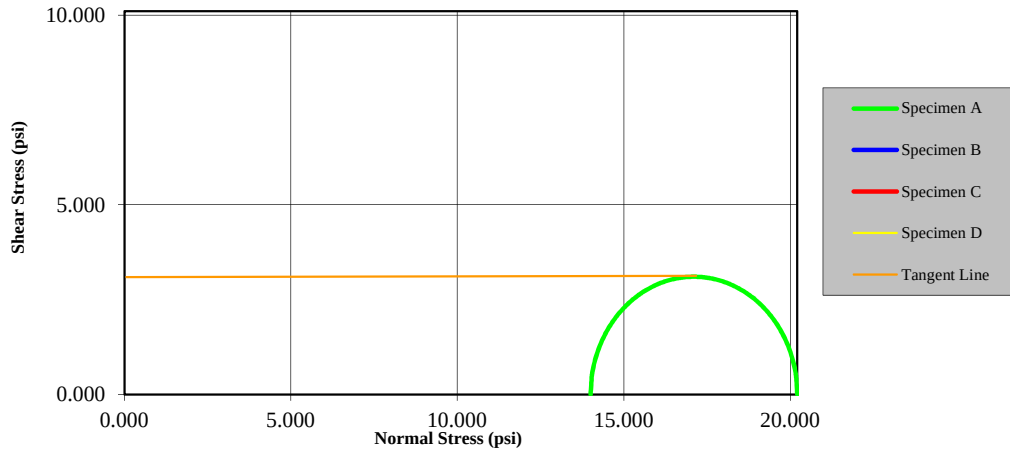
Date: 02/01/18

Checked By:

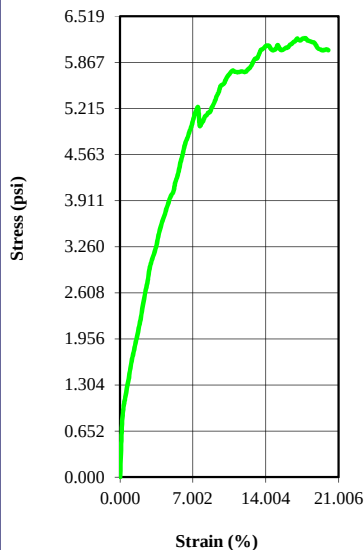
Date: 1/23/2008

Tested By: A. Suprunenko

Mohr Circles



Stress-Strain Curve



		Specimen			
Before Test		A	B	C	D
Water Content (%)		49.12	0.00	0.00	0.00
Dry Density (pcf)		73.45	0.00	0.00	0.00
Saturation (%)		103.94	0.00	0.00	0.00
Void Ratio		1.25	0.00	0.00	0.00
Diameter (in)		2.779	0.000	0.000	0.000
Height (in)		5.809	0.000	0.000	0.000
Liquid Limit					
Plastic Limit					
Specific Gravity		2.650			
After Test		A	B	C	D
Water Content (%)		47.62	0.00	0.00	0.00
Test Data		A	B	C	D
Strain Rate (in/min)		0.06	0.00	0.00	0.00
Peak Deviator Stress (psi)		6.209	0.000	0.000	0.000
Axial Strain @ Failure (%)		17.825	0.000	0.000	0.000
		Cell Pressure			
Cell (psi)		14.0	0.0	0.0	0.0
Back (psi)		n/a	n/a	n/a	n/a
		Principle Stresses at Failure			
σ_1 (psi)		20.2	0.0	0.0	0.0
σ_3 (psi)		14.0	0.0	0.0	0.0

Mohr-Coulomb Strength Parameters		Sample Description	
C (psi)	3.1	Lean Clay (CL) , gray	
Friction Angle Ø	0.10		
Project Information			
Project Name:	CMP Substation		
Project Number:	J1175119	Job Number:	J1175119
Location:	Forest Ave, Portland ME	Boring Number:	
Client:		Sample Number:	B-3
Remarks:			

ASTM D5334 Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure

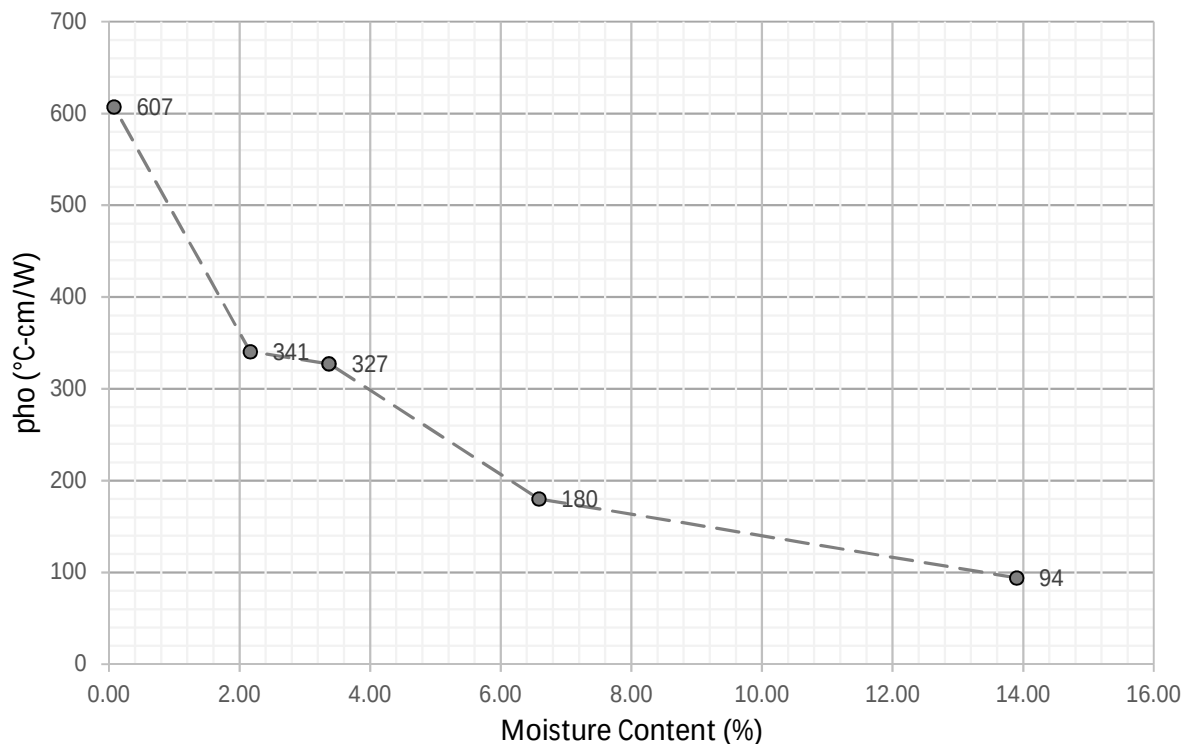
Project Name: J1175119	Proctor: ASTM D1557 / A
Project Number : CMP Substation, Portland, ME	Max Dry Density, pcf: 115.7
Sample: B-3	Optimum Moisture Content, %: 13.1
Depth: 3'-5'	Target Compaction, %: 90.0
	Target Dry Density, pcf: 104.1

Specimen	Length	Diameter	Tested By	Water Content, %	Dry Density	Corrected Thermal Resistivity, (°C-cm/W)
	in	in			pcf	
1	8.0	2.8	AMM	13.90	104	94
2	8.0	2.8	AMM	6.58	104	180
3	8.0	2.8	AMM	3.37	104	327
4	8.0	2.8	AMM	2.16	104	341
5	8.0	2.8	AMM	0.08	104	607

Correction Factor: 1.16

As-Received Moisture, %: 6.57

Thermal Dryout Curve



Reviewed By
Date

AS
2/7/2018

Terracon

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J1-D5334, 11-13-17, Rev.0

Exhibit A-1
Field Electrical Resistivity Test Results
Forest Ave Substation
Portland, Maine
Project No. J1175119



Test Location: Substation	Equipment: MiniSting R1
Test Date: 5/22/2018	Tested by: Andrew Michaud
Weather: Overcast	Temperature: 60°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω -m)
	R1	R2	R3	Average	
2	227.5	227.5	227.5	228	871
5	61.38	61.4	61.4	61	588
10	12.36	12.36	12.37	12	237
20	1.369	1.366	1.367	1	52
40	0.3108	0.3102	0.3116	0	24
North End Point Coordinates: 43.66078, -70.26800					
South End Point Coordinates: 43.66050, -70.26835					
Center Point Coordinates: 43.66061, -70.26821					
Line Orientation: N-S					

Line Notes: Underground and above ground electrical lines may cause interference. Soil is hard packed, difficult to drive stakes but still possible.

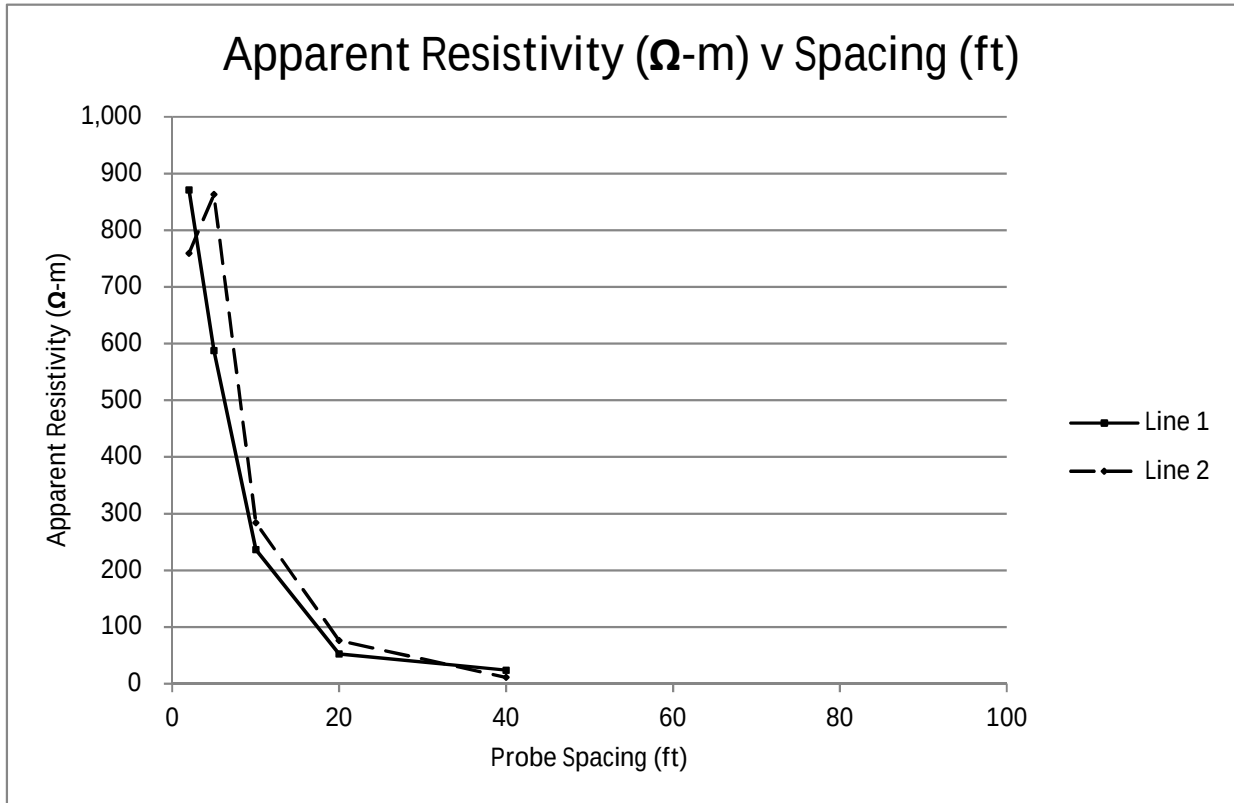
Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω -m)
	R1	R2	R3	Average	
2	198.3	198.2	198.2	198	759
5	90.13	90.12	90.13	90	863
10	14.84	14.84	14.84	15	284
20	1.989	1.989	1.988	2	76
40	0.1443	0.1449	0.1458	0	11
East End Point Coordinates: 43.66067, -70.26786					
West End Point Coordinates: 43.66057, -70.26820					
Center Point Coordinates: 43.66067, -70.26795					
Line Orientation: E-W					

Line Notes: Underground and above ground electrical lines may cause interference. Soil is hard packed, difficult to drive stakes but still possible. Pavement present from 11'-28' on eastern arm, spike driven through crack filled with soil.

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"

Test Location: Substation



SUPPORTING INFORMATION

UNIFIED SOIL CLASSIFICATION SYSTEM

Iberdrola Central Maine Power Substation Modernization Project ■ Forest Avenue - Portland, Maine

March 6, 2017 ■ Terracon Project No. J1175119



Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A					Soil Classification	
					Group Symbol	Group Name ^B
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	Cu ³ 4 and 1 ≤ Cc ≤ 3 ^E	GW	Well-graded gravel ^F	
			Cu < 4 and/or 1 > Cc > 3 ^E	GP	Poorly graded gravel ^F	
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}	
			Fines classify as CL or CH	GC	Clayey gravel ^{F, G, H}	
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	Cu ³ 6 and 1 ≤ Cc ≤ 3 ^E	SW	Well-graded sand ^I	
			Cu < 6 and/or 1 > Cc > 3 ^E	SP	Poorly graded sand ^I	
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH	SM	Silty sand ^{G, H, I}	
			Fines classify as CL or CH	SC	Clayey sand ^{G, H, I}	
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots on or above “A”	CL	Lean clay ^{K, L, M}	
			PI < 4 or plots below “A” line ^J	ML	Silt ^{K, L, M}	
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay ^{K, L, M, N}
			Liquid limit - not dried			Organic silt ^{K, L, M, O}
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line	CH	Fat clay ^{K, L, M}	
			PI plots below “A” line	MH	Elastic Silt ^{K, L, M}	
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay ^{K, L, M, P}
			Liquid limit - not dried			Organic silt ^{K, L, M, Q}
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat	

^A Based on the material passing the 3-inch (75-mm) sieve

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

$$E \text{ Cu} = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^F If soil contains ³ 15% sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains ³ 15% gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains ³ 30% plus No. 200 predominantly sand, add "sandy" to group name.

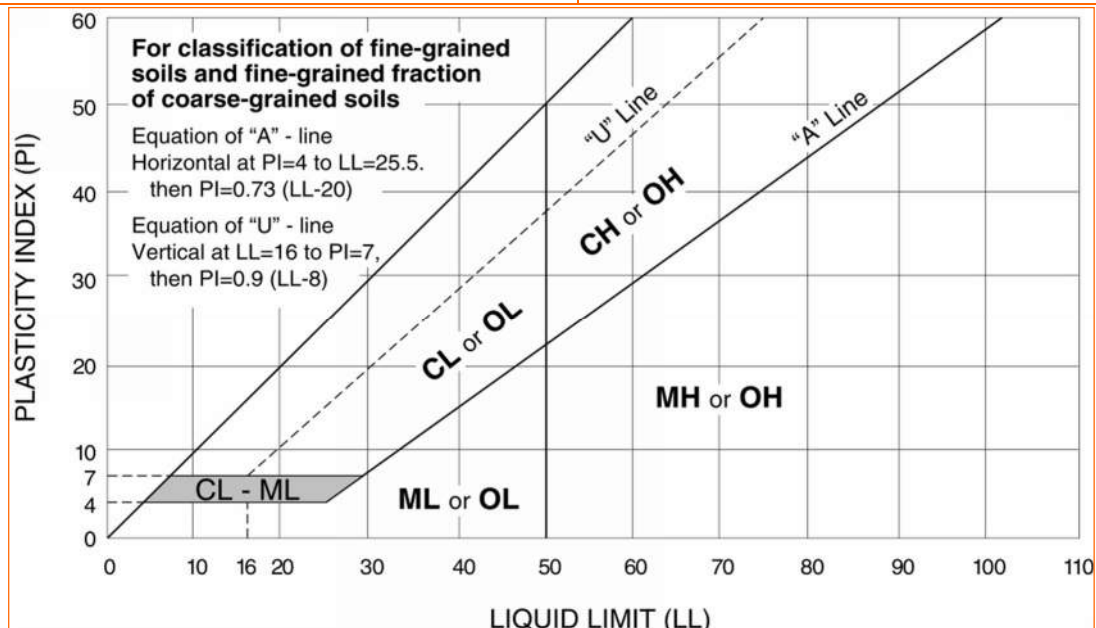
^M If soil contains ³ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

^N PI ³ 4 and plots on or above "A" line.

^O PI < 4 or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



APPENDIX D – HYDROLOGIC & HYDRAULIC CALCULATIONS



State of Maine
3523/084 March 18, 1974
PARCEL No. (967-3)

State of Maine
PARCEL No. (966)



LEGEND:

- 10 — EXISTING MAJOR CONTOUR
- — — EXISTING MINOR CONTOUR
- o — o — FENCE
- 10 — FINISHED GRADE MAJOR CONTOUR
- — — FINISHED GRADE MINOR CONTOUR
- GRADING DAYLIGHT
- LOD — LIMIT OF DISTURBANCE
- — — STORM DRAIN PIPE
- SS — SANITARY SEWER PIPE
- W — DOMESTIC WATER SERVICE PIPE
- — — SS — EXISTING SANITARY SEWER PIPE
- — — W — EXISTING WATER PIPE
- + 10.5 PROPOSED FINISHED GRADE SPOT ELEVATION
- + [11.6] MATCH EXISTING SPOT ELEVATION



SCALE IN FEET
ORIGINAL DRAWING SIZE IS 11"x17"

**FOR PERMITTING
PURPOSES ONLY**



FIGURE D-1
FOREST AVE
PROPOSED RUNOFF AREAS
11/26/19

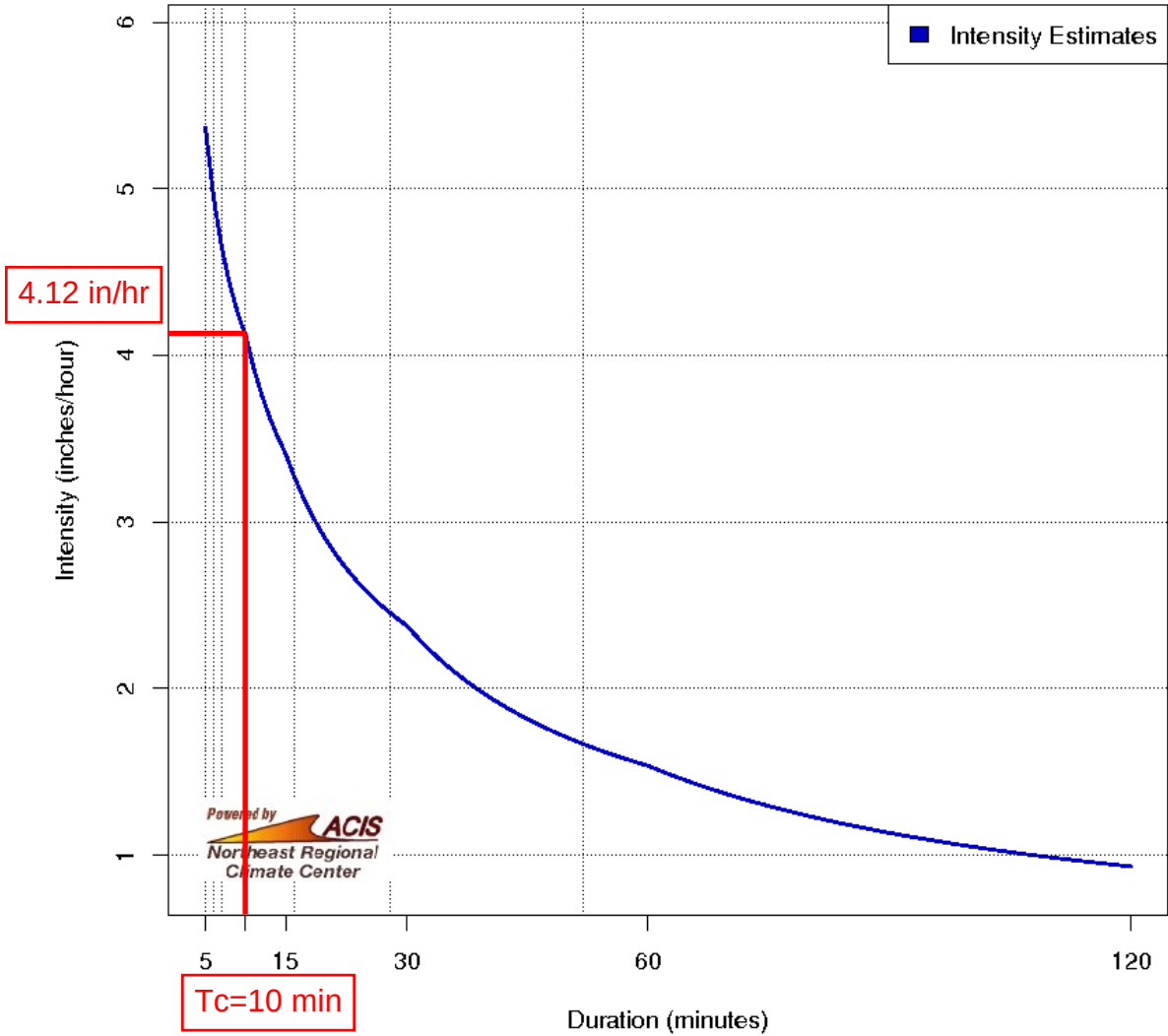
RUNOFF COEFFICIENTS FOR THE RATIONAL FORMULA BY HYDROLOGIC SOIL GROUP AND SLOPE

Land Use	A			B			C			D		
	0-2%	2-6%	6+%	0-2%	2-6%	6+%	0-2%	2-6%	6+%	0-2%	2-6%	6+%
First row of each entry provides runoff coefficients for storm recurrence intervals of 25 years or less. Second row provides runoff coefficients for storm recurrence intervals of 25 years or more.												
Cultivated Land	0.08	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
	0.14	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Meadow	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Residential												
Lot Size (1/8 acre)	0.25	0.28	0.31	0.27	0.30	0.35	0.30	0.33	0.38	0.33	0.36	0.42
	0.33	0.37	0.40	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
Lot Size (1/4 acre)	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.30	0.34	0.40
	0.30	0.34	0.37	0.33	0.37	0.42	0.36	0.40	0.47	0.38	0.42	0.52
Lot Size (1/3 acre)	0.19	0.23	0.26	0.22	0.26	0.30	0.25	0.29	0.34	0.28	0.32	0.39
	0.28	0.32	0.35	0.30	0.35	0.39	0.33	0.38	0.45	0.36	0.40	0.50
Lot Size (1/2 acre)	0.16	0.20	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.30	0.37
	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34		
Lot Size (1 acre)	0.14	0.19	0.22	0.17	0.21	0.26	0.20	0.25	0.31	0.24	0.29	0.35
	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.40	0.31	0.35	0.46
Industrial	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.69	0.69	0.69	0.69	0.70
	0.85	0.85	0.85	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial	0.71	0.71	0.71	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.90	0.89	0.89	0.90
Streets	0.70	0.71	0.71	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
	0.76	0.77	0.80	0.80	0.82	0.84	0.84	0.85	0.80	0.89	0.91	0.95
Open Space	0.05	0.10	0.08	0.08	0.13	0.19	0.12	0.17	0.24	0.16	0.21	0.28
	0.11	0.16	0.14	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Parking	0.85	0.86	0.85	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
	0.95	0.96	0.95	0.95	0.96	0.97	0.95	0.95	0.97	0.95	0.96	0.97

IMPERVIOUS

GRASSED

Intensity Frequency Duration – 10yr
(43.661N, -70.268W)



Time (mins)	Intensity (in/hr)
5	5.36
6*	4.95
7*	4.65
8*	4.43
9*	4.25
10	4.12
11*	3.92
12*	3.76
13*	3.62
14*	3.51
15	3.40
16*	3.28
17*	3.16
18*	3.06
19*	2.97
20*	2.89
21*	2.82
22*	2.75
23*	2.69

Runoff Peak Discharge Calculations

Rational Method

Project: Forest Avenue Substation Expansion
 Project No.: 102676
 Calculated: K. Black
 Checked: B. Maurer
 Date: 10/09/19

	DRAINAGE AREA			DESIGN STORM EVENT	
				10-year, 24-hour	
	Area	Runoff Coeff.	Time of Concentration	Intensity	Peak runoff
	A	C	T _c	i ⁽¹⁾	Q
	[ac]		[minutes]	[in/hr]	[cfs]
Drainage Sub Area 01	0.268	0.37 ⁽²⁾	10	4.12	0.41
Drainage Sub Area 02	0.304	0.69	10		0.86

Reference: *Maine Stormwater Management Design Manual, Technical Design Manual Volume III, May 2016*

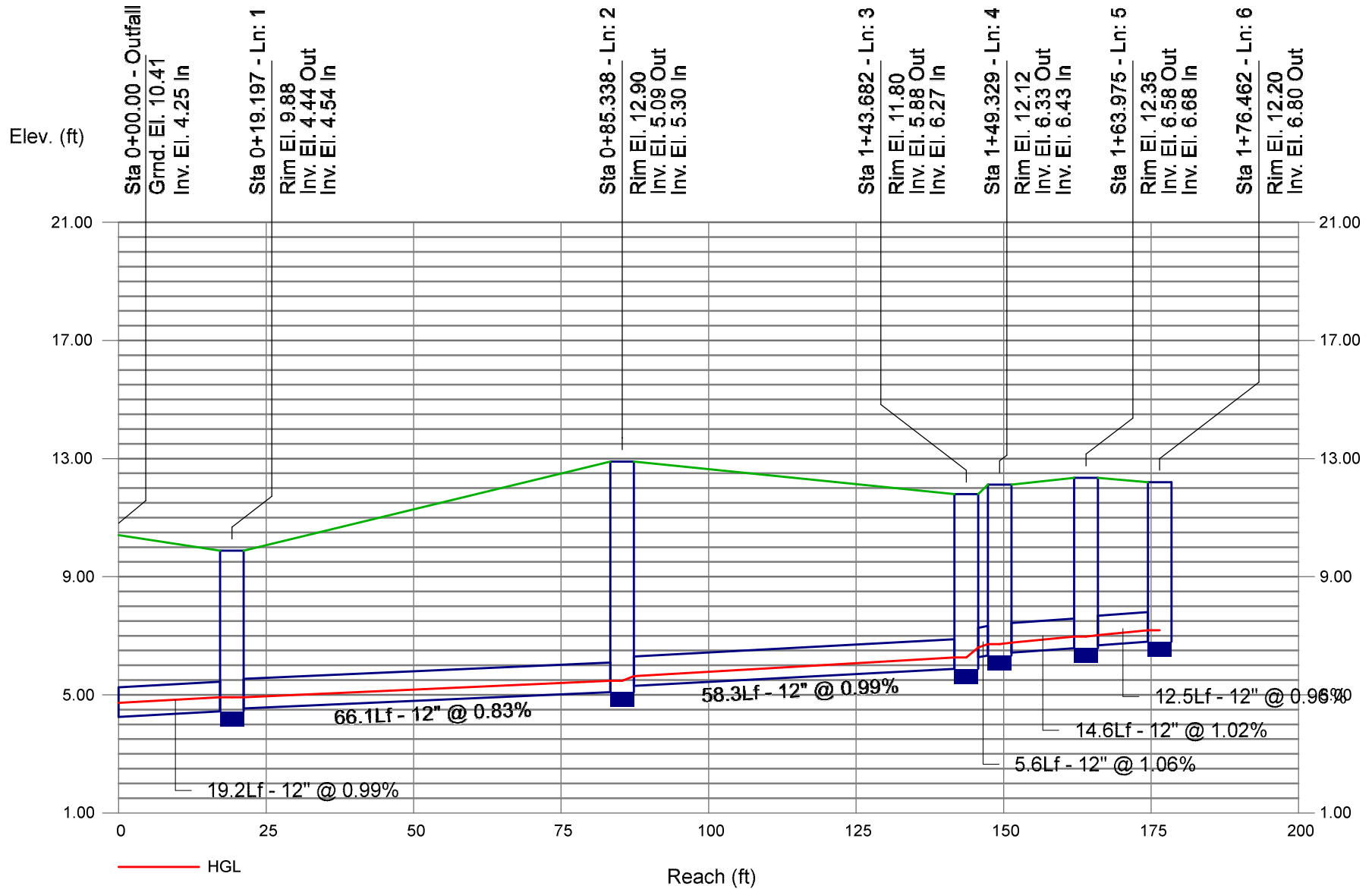
⁽¹⁾ Intensity as specified in IDF curve for T_c from <http://precip.eas.cornell.edu> for Portland, ME

⁽²⁾ Weighted runoff coefficient, see Figure D-1 for justification

Line No.	Inlet ID	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Line ID	Line Size (in)	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	HGL Dn (ft)	HGL Up (ft)	Minor Loss (ft)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)		
1	CB-01	10.41	9.88	P-01	12	4.25	4.44	0.99	4.73	4.92	0.26	1.27	3.54	3.45		
2	MH-01	9.88	12.90	P-02	12	4.54	5.09	0.83	4.92	5.48	n/a	0.86	3.25	3.12		
3	MH-02	12.90	11.80	P-04	12	5.30	5.88	0.99	5.64	6.27	n/a	0.86	3.55	3.39		
4	EX-CB-01	11.80	12.12	P-05	12	6.27	6.33	1.06	6.60	6.72	n/a	0.86	3.67	3.43		
5	MH-03	12.12	12.35	P-06	12	6.43	6.58	1.02	6.76	6.97	n/a	0.86	3.60	3.41		
6	CB-02	12.35	12.20	P-07	12	6.68	6.80	0.96	7.02	7.19	n/a	0.86	3.49	3.37		
Project File: Forest Ave_HydraFlow.stm													Number of lines: 6		Date: 11/26/2019	
NOTES: ** Critical depth																

Storm Sewer Profile

Proj. file: Forest Ave_HydraFlow.stm



APPENDIX E – CMP ENVIRONMENTAL GUIDELINES



**Environmental Guidelines
For Construction and Maintenance
Activities on Transmission Line
And Substation Projects**

Prepared for:

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- C. OTHER RECOMMENDED REFERENCE MANUALS
- D. CONSTRUCTION TECHNIQUE ILLUSTRATIONS
- E. EROSION AND SEDIMENTATION CONTROL LAW
- F. MAINE SLASH LAW
- G. CULVERT SIZES FOR STREAM CROSSINGS (3X RULE)

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CENTRAL MAINE POWER COMPANY

Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects

1.0 INTRODUCTION

These guidelines contain standards and methods used to protect soil and water resources during construction, reconstruction, and maintenance of transmission lines and substations. They are based on practical methods developed for construction in utility corridors and their use is enforced by both State of Maine and Federal regulatory agencies. The construction practices described in this manual are typically required by the regulatory agencies for all projects. These practices are commonly referred to as Best Management Practices (BMPs). Illustrations have been provided as part of this manual (Appendix D) which demonstrate both the proper and improper techniques used for the more common construction activities.

All contracts for work performed on Central Maine Power Company (CMP) transmission line rights-of-way and substation sites will include these specific guidelines to ensure the project is constructed in an environmentally conscious manner. CMP personnel or their designated representatives will ensure that the guidelines are followed by inspecting all work and prescribing corrective steps to be taken where necessary. While this manual takes into consideration legal requirements, project personnel are still responsible for compliance with all federal, state, and local requirements.

This guide uses a number of scientific and technical terms. Definitions of these terms are provided in Appendix A.

2.0 PLANNING AND DESIGN CONSIDERATIONS

Planning is an important practice that will reduce the risk of erosion on a construction site, saving both time and money for Central Maine Power Company and its contractors. An erosion control plan should be prepared during project planning and design phases. It will likely be required for any Maine Department of Environmental Protection and/or local permits.

The erosion control plan should consist of:

- A narrative.
- A map.
- Plan details.

The narrative should describe the proposed project, existing site conditions, adjacent land uses, and any natural resources or properties that might be affected by the project. Other important details to include are descriptions of critical areas, proposed construction start and end dates, construction sequence, and brief descriptions of erosion and sedimentation control measures,

inspections and maintenance programs, and other clearing or construction that has taken place on the site in the last five years.

The map should include pre-development site contours at a scale to identify runoff patterns (minimum 5-foot contour interval), final contours, limits of clearing and grading, existing buffers, critical areas, natural resources, erosion control measures, and other clearing or construction that has taken place on the site in the last five years.

The plan details should include drawing of the erosion control structures and measures, design criteria and calculations, seeding specifications, and inspection and maintenance notes.

Key considerations include resource identification, familiarizing all parties with the construction site and limitations, and construction sequence.

2.1 Resource Identification

Sensitive natural areas which will receive priority treatment include:

- Streams and rivers.
- Great ponds.
- Wetlands.
- Steep slopes.
- Unstable soil conditions.

Sensitive natural areas which may receive priority treatment, depending upon the specifics of the project, include:

- Stream, river, pond, and wetland buffers.
- Significant wildlife habitats.
- Habitat for rare species.
- Historic and prehistoric sites.

During the planning phase, all sensitive natural areas that require priority treatment will be identified. The method of avoiding or crossing the sensitive natural areas to minimize impacts will be identified and incorporated into the project plans. Project plans should be designed and drawn to provide contractors and inspectors with a comprehensive reference guide that include, but is not limited to, locations of sensitive natural areas, access, and abutter and landowner issues. If modifications to the plans need to be made in the field, a designated person shall make necessary changes and shall notify all necessary personnel promptly. Copies of these plans should be provided and explained to equipment operators to assure that construction practices meet the intent of avoiding or minimizing impacts to the identified sensitive natural areas. In addition to the plans, the proposed access ways and water/wetland crossing locations, as well as other environmentally sensitive areas where activities will be restricted or prohibited, will be flagged and/or have signs posted.

Prior to crossings or construction in or near any sensitive natural areas, a “walk-through” will be conducted. Attendees at the walk-through will include: 1) the contractor, 2) CMP and/or any designated representative, and may include 3) any assigned Third Party Inspector. The purpose of the walk-through is to establish the following objectives, **prior to any clearing or construction work**:

- Identify available or alternate points of access to the project site.
- Identify sensitive natural areas.
- Identify future “No-Access” areas.
- Review color designation for all flagging used.
- Establish the Communication Chain of Command (Contact Point).
- Identify and flag access/construction roads within the ROW and/or project area.
- Establish methods of access over water resource areas (mats, timber corduroy, frozen ground, tracked equipment).

In order to minimize impacts to sensitive natural areas, the above objectives will continually be evaluated throughout the construction process. Project superintendents, foremen, and inspectors should also monitor weather conditions and reports on an on-going basis. Knowledge of changing or anticipated wet weather will allow time to address erosion control needs. In this way, CMP and its contractors will be prepared to respond to changing environmental conditions (e.g., unusually wet or dry weather) and other unknowns that are inherent in the construction and maintenance of transmission lines.

2.2 “Walk-Through” Mechanics

2.2.1 Use of Flagging and Signs

Flagging will be conducted at the time of the walk-through in order to visually identify select features or construction methods to be used. Wetlands may be flagged earlier as part of project permitting. Signs may also be installed following the walk-through to direct construction to approved access routes and away from “no access” areas. The CMP flagging color-code is as follows:

- **Glow-pink** with the printed words “Wetland Delineation”, “Wetland Boundary” or “Wetlands”. This flagging denotes the edge of wetlands.
- **Red** with or without the printed words – “Do Not Cross”. This flagging denotes a No-Access area where no equipment is allowed.
- **Yellow** – no printed words. This flagging denotes the location of an environmental measure such as a waterbar, hay bale barrier, or silt fence.
- **Blue** – no printed words. This flagging denotes approved travel ways. This is typically flagged on each side of the access-way to denote the designated travel lane for all access.
- **Glow-pink with black stripes** or otherwise printed with the words Buffer or Wetland Buffer. This denotes a setback from a water resource and should be treated the same as No-Access area.

2.2.2 Identification and Use of Existing Roads

Available logging, farm, or access roads, as well as other existing rights-of-way, will be utilized for access to and from transmission line rights-of-way with permission of the respective landowners. In order to minimize ground disturbance, existing roads within the right-of-way and wetland/stream crossing areas will be used whenever possible for travel during construction, unless a better route is agreed upon during the walk-through. The movement of equipment and materials within the transmission line right-of-way will be confined as much as possible to a single road or travel path.

For example, it may be better to construct new access roads in order to: (1) minimize the span of a wetland or stream crossing, or (2) avoid the more environmentally sensitive or “wetter” portions of a wetland or stream crossing.

In all cases, CMP and its contractors will attempt to avoid and minimize impacts to sensitive natural areas. As a result of this procedure, wetland and stream crossings, steep slopes, unstable soils, and other sensitive natural areas will be avoided and adverse impacts minimized whenever practicable.

2.3 Construction Sequencing

Although a “Project Plan” may be specific in identifying the *locations* of water resource areas (wetlands, streams, etc.), and the *methods* of access over water resource areas (crane mats, frozen ground, etc.) it should not dictate *when* construction activities should occur. It would be impractical to include day to day activities in the “Project Plan” such as, ‘pole X will be installed on Y date’. However, including environmental considerations in the daily and weekly project planning is very important. Factors such as the project schedule and weather often determine where and when construction activities occur; environmental impacts should also be considered. Below are some guidelines:

- Work closely with the individual(s) in charge of environmental compliance to plan project activities.
- Construction activities that cause soil disturbance should not occur during or just prior to forecast heavy rain events.
- Coordinate access planning with all of the contractors on the project. Often temporary access roads are used by several different contractors and the construction and use of temporary access roads can cause significant soil disturbance. Minimize equipment and vehicle travel on temporary access ways.
- Stabilize/restore disturbed areas as soon as possible, preferably while equipment is on site. Additional trips with equipment can create more soil disturbance which will need to be stabilized. Often a site can and should be stabilized within hours of when the soil disturbance occurred.
- Use frozen conditions to your advantage. There may be instances where water resource areas can be crossed during frozen conditions in lieu of installing crane mats. Before using this technique consult with the project environmental inspector.

- Crane mats should be removed as soon as they are no longer needed and/or when conditions are favorable.

3.0 STANDARDS FOR CONSTRUCTION

3.1 Road Construction

The following five standards apply to the construction and/or upgrade of all roads, skid trails, yarding areas, or work pads whether temporary or permanent.

1. Where construction will be located near water resources, such that material or soil may be washed into them, these disturbances will be set back from the edge of the water resource to maximize the amount of undisturbed filtering area between the disturbed area and the resource. These “filter strips” will consist of an area of undisturbed vegetation between the edge of disturbed area and/or silt fence/hay bale barriers placed to intercept any sediment load in runoff water before it can enter the resource area. In order to maintain the integrity and effectiveness of filter strips, sediment barriers should be installed very early in the construction sequence, and they need to be monitored to make sure they are functional. Effective filter strip widths may vary from only a few feet in relatively well drained flat areas to as much as several hundred feet in steeper areas with more impermeable soils. The minimum width of the buffer strip shall be 25 feet or in accordance with local CEO or DEP regulations. The width of the filter strip shall be increased proportionately for slopes longer than 150 feet or for higher sediment concentrations. **Table 1** below provides the recommended widths for the filter strips according to the slope of land between the edge of the resource and any exposed soil.

Table 1 Recommended Widths For Filter Strips Between Disturbed Areas And Water Resources	
Slope of Land Between Disturbance and the Resource (Percent)	Width of Filter Strip* (Feet)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165
*Measured along surface of the ground	

2. Wherever possible, construction equipment will either avoid steep slopes or proceed across the slope in a safe manner to avoid excessive disturbance of vegetation and soils. Equipment will not travel straight up or down any slopes with a grade steeper than 10 percent, except where necessary due to safety concerns and/or terrain constraints.

3. Where access roads or construction areas are to be built across the slope, the area will be properly sloped, slanting away from the cut bank to the outside edge of the roadbed in order to facilitate road surface drainage.
4. Slopes of cut-and-fill banks will be no steeper than 1 horizontal to 1 vertical. If located within 100 feet of water resources, the slopes will be no steeper than 2 horizontal to 1 vertical.
5. Rivers, streams, and wetland areas will be crossed, where necessary, at right angles to the channel and/or at points of minimum impact. To insure that natural drainage patterns will not be altered or restricted as a result of construction activities, crossings will be designed and constructed according to specific standards outlined below.

3.2 Stream or Wetland Crossings

The following standards apply to all unavoidable stream, drainage way, or wetland crossings encountered while accessing the project site or on the project site itself.

3.2.1 Types of Crossings Used

The type of crossing used for access is dependent on: the purpose and use of the crossing, the nature of the resource being crossed, ground conditions present at the time of construction, and construction materials available. Some planning guidance is provided below. The appropriate means and location of the crossing will be determined at the time of the formal walk-through. It is important to consult with the project environmental inspector prior to installing any crossing.

- Permanent culverts and bridges will be used only where long-term, continued, and frequent access is required (such as substation access roads).
- Temporary crossings will be used at all other locations. Temporary bridges, culverts, or crane mats must be used to cross any streams, drainage ways, or wetland swales that contain: (1) flowing water, (2) standing water, (3) saturated soils, or (4) organic/mucky soils.
- The use of corduroy as crossing material will be limited to wetlands which are not anticipated to have flowing or standing water during the construction period.
- In certain cases, no crossing material will be required if the stream bottom or drainage way is dry and contains a gravel or solid rock bottom (a “ford”). Fords can only be used if they will cause no unreasonable sedimentation of the stream and no unreasonable alteration of the stream banks and bottom.
- All crossings should include water bars or broad based dips or turn outs on the access, appropriately spaced on each side of the crossing, to promote filter-strip treatment of runoff. Consult Table 4 on page 12 of this document for specific water diversion structure spacing standards.
- All temporary crossings must be stabilized within seven (7) days of its removal, unless specified otherwise.

3.3 Construction in Wetlands

Where structures are to be placed in wetlands, topsoil must be excavated first, and stockpiled separate from subsoil. Be sure that stockpile soils are placed in such a manner that they are

readily replaced into the excavated area. Soils shall be replaced into the excavated area in the opposite order they were removed. Excavation and pole placement in wetland areas should be completed within the same day. After pole installation, topsoil must be restored to the original surface grade, except where mounding around a structure is necessary for structure stability.

4.0 INSTALLATION OF CROSSINGS

4.1 Bridges

Bridges are a preferred method for temporary access waterway crossings. Normally, bridge construction causes the least disturbance to the waterway bed and banks when compared to the other waterway crossing methods. Most bridges can be quickly removed and reused without significantly affecting the stream or its banks and without interfering with fish migration.

Materials

Access bridge construction typically entails the use of log stringers as construction materials.

Sizing

Table 2 below illustrates the log sizing requirements depending on the span and anticipated loads.

Table 2		
Log Bridge Stringer Requirements		
Span	Minimum Log Diameter*	
	(80,000 lb. Load)	(40,000 lb. Load)
8 ft.	16 in.	12 in.
12 ft.	18 in.	14 in.
16 ft.	20 in.	16 in.
Wheel guards: 10" diameter		
- Size of deck planks: 4" x 12" x 12'		
* Assume 6 stringers at 24" centers		

Positioning

The following is guidance for the positioning and installation for all permanent and temporary bridges:

- Access roads will cross streams at right angles to the channel at a location with firm banks and level approaches whenever possible.
- Bridge piers and abutments will be aligned parallel to the stream flow so that the original direction of stream flow is not altered.
- Piers and abutments will be imbedded in good foundation material. The grade of the bridge should coincide with that of the road wherever practicable.

For additional specifications on bridge construction, refer to section F-2 of the Maine Erosion and Sediment Control BMPs (see full citation in Appendix C).

4.2 Culverts

Materials

Permanent culverts will be either corrugated metal or plastic pipe. Temporary culverts will be corrugated metal, plastic pipe, or lumber ties. Chemically-treated wood will be not used.

Sizing

Permanent culverts will be sized to have a diameter of at least 3 times the cross-sectional area of the stream channel or will be designed to accommodate 25-year frequency flows. Multiple culverts may be used in place of one large culvert if they have the equivalent capacity of a larger one. A culvert sizing criteria table (3x Rule) produced by the MDEP can be found in Appendix G. However, it is recommended that an engineer be consulted when installing any permanent culvert.

Temporary culverts will also be sized to provide an opening at least 3 times the cross-sectional area of the stream channel and sized to accommodate a 25-year frequency storm flow. The stream channel cross-section will be determined at highest flows or will be approximated during periods of lower flows using the apparent natural high water marks remaining on the stream banks. For small intermittent streams, drainage ways or wetland crossings, the minimum sized culvert that may be used is 18 inches. Multiple culverts may be used in place of one larger culvert if they have the equivalent capacity of a larger one.

Positioning

The following is guidance for the positioning of all permanent and temporary culverts:

- Culverts should be placed to allow for the crossing to take place at right angles to the channel to assure that natural drainage patterns will not be altered.
- Culverts should be placed at the point of narrowest crossing and where firm banks and level approach slopes are available. Slopes should be no greater than 1.5 to 1.

Installation

The following is guidance for the installation of all permanent and temporary culverts:

- Culverts should be of sufficient length to allow both ends to extend at least one foot beyond the toe of any fill used to cover the culvert.
- Inlet and outlet armoring shall extend at least one pipe diameter beyond the upstream and downstream end of the culvert. See Table 3 below for outlet protection in erodible areas.
- Culverts should be bedded on firm ground. Supplemental use of geotextile with gravel can be used to create this firm base. Permanent culvert installation should include firm compaction of the foundation and the fill around the sides of the culvert. Compaction should be done in no less than 8-inch lifts.
- Both the inlet and outlet ends of the culverts will be set at or slightly below the natural stream bottom to allow passage of fish and other aquatic life at all levels of flow. At no point should either end of an installed culvert be positioned in the air out of the water.
- Multiple culverts must be offset in order to concentrate low flows into the culvert within the natural channel.

- When working in and around a perennial stream, temporary stream diversion may be necessary to avoid creating turbidity in the stream water. This type of work requires a permit from Maine DEP, and must be coordinated with the project environmental inspector.
- Fill used to bury the culvert will be compacted at least half-way up the side of the culvert for its full length in insure that flowing water will not undermine the culvert.
- Culverts will be covered with fill to a depth of at least one foot or one and a half times the culvert diameter, whichever is greater.
- Road fill at the upstream (headwall) and downstream (out-fall) ends of culverts will be armored with either rock rip rap or logs to protect the road fill from being eroded by the action of water or road traffic. This material will be installed up to the level of anticipated high water.
- In areas where the streambed appears highly erodible, the streambed at the outlet end of the culvert will be lined with riprap to prevent erosion and potential stream bed scour. Table 3 below indicates the distances away from the culvert to install such riprap.

Table 3 Culvert Size - Length of Rock Protection	
Culvert Diameter (Inches)	Length of Rock Protection From Culvert (Feet)
12 – 20	7
21 – 24	9
30	11
36	13
42 – 48	18
54 – 60	24
66 – 78	32

Removal

Temporary culverts will be removed once their use is no longer necessary. The fill material can be redistributed and spread out on the nearby uplands at a distance sufficient to prevent its reentry into the resource. Silt fence/hay bales, seeding, and mulching may be necessary to stabilize this material. The banks and bottoms of the stream, drainage way, or wetland should be restored to original conditions. Exposed soils on the banks and within 100 feet of the crossing should be stabilized using seed and mulch. Some banks and steep slopes adjacent to streams may require stabilization with curlex or jute matting in combination with seed and mulch.

4.3 Mats (Crane or Swamp Mats)

CMP construction projects require that adequate mats are present at the project site prior to construction. A readily accessible source of mats should also be available in case construction conditions change and necessitate the need for more mats.

Materials

A number of different sized and constructed crane mats are typically available. CMP requires that the appropriate mats be used for the appropriate crossing. For example:

- Longer mats should be used for the longer crossing spans. This practice avoids the need to install additional mats within the crossing area in order to support the “span” mats.
- Mats should be in good condition to allow for their “clean” installation. Having mats in good condition prevents them from being dragged in versus them being carried in due to broken hitching cables, breaking apart on the job site, or becoming imbedded in mud due to their inability to support the required weight.
- Mats with partial/short timbers joined end to end should generally not be used to cross stream channels.

Installation

- Whenever possible, mats should be carried and not dragged. Dragging mats creates more soil disturbance which requires additional erosion control or final restoration work.
- At the crossing location, the ends of the crane mats should extend at least two feet onto firm banks or several feet into the upland edge of a wetland to assure a dry, firm approach onto the mats.
- At crossings which contain open or flowing water, the mats should be supported within the span using cross mats as abutments in order to prevent the impoundment of water or having water flow over the mats.
- At “dry” crossings where no water is present or anticipated during project construction, the mats may be placed directly onto the sensitive natural area in order to prevent excessive rutting, provided stream banks and bottoms are not altered.

Maintenance

Matted crossings should be continually monitored to assure their correct functioning. Mats which become covered with dirt should be kept clean and the material removed must be disposed of in an upland location. The material must not be scraped and shoveled into the water resource. Mats which become imbedded must be reset or layered to prevent mud from covering them or water passing over them.

Removal

Mats should not be removed until their use is absolutely no longer necessary. Specifically, all final restoration work should be completed prior to the mats being removed from the crossings. The planned removal of mats should be coordinated with CMP (or designated representative), the project environmental inspector, and any Third Party Inspector. As temporary structures, they should be removed within one year from the date of installation. All areas disturbed during ford removal shall be stabilized with seed and mulch.

4.4 Corduroy

Materials

Corduroy material will consist of de-limbed trees or logs. The logs must have a diameter greater than three inches at the small end and lengths greater than 18 feet. Shorter length material may be used only as described in the Installation section below.

Positioning

Corduroy should be placed perpendicular to the direction of travel. Corduroy should be placed at the point of narrowest crossing and where firm banks and level approach slopes are available.

Installation

The corduroy should be placed with the longer length pieces laid down first. The bed of corduroy should not only be placed within the low portions of the crossing but also for at least three feet up the sides of any upland side slopes in order to prevent rutting and sedimentation from the approaches to the crossing.

Once a thick base of corduroy has been laid, pieces shorter than 18 feet can be used to fill gaps and raise the elevation of the corduroy to provide for a more stable crossing.

Removal

Removal is the reverse of installation. Once the corduroy has been removed from the crossing, it may be moved off the right-of-way, burned, or chipped. The material may also be spread and distributed on the ROW over the nearby upland if in accordance with the Maine Slash Law (see Appendix E) and approved by a CMP representative. The banks of streams and drainage ways must be graded back to original conditions. Exposed soils on the banks and within 100 feet of the crossing must be stabilized using seed and mulch. Banks of drainage ways that are expected to receive high flows should be stabilized with seed and curlex or jute matting.

5.0 SURFACE WATER DIVERSION STRUCTURES (WATER BARS)

A number of above-ground structures or techniques are available to divert water out of travel ways and work areas in order to prevent subsequent runoff and erosion. The terminology and definitions for these techniques (i.e., broad-based dips, water bars, skid humps, water turnouts, and cross-drainage box culvert) vary, but the purpose of all is to redirect water moving down a slope into adjacent vegetated areas (filter strips). Any activities that involve land grading have the potential to cause sedimentation. Their use and installation needs to be carefully planned. Planning for these techniques must include timing, use of natural buffers (filter strips), mulching, and temporary and permanent seeding. Minimizing the area of soil exposed at one time is a key component of ensuring that surface water diversion structures function effectively. General standards for their construction are as follows.

Materials

Most of these structures are constructed by excavating or moving and shaping earth from within the access way or work area. The cross-drainage culvert structure typically uses logs or timber to form a box-like structure to catch water from travel ways or side ditches in order to direct it across the travel way and away from disturbed areas.

Positioning

These structures should be installed immediately above and along steep pitches in the road and below seepage areas on natural or cut banks. They should be sited to take advantage of existing vegetation for filtering and slope away from the travel surface. The interval for installing these diversion structures depends on the slope of the road, as well as the nature of the road surface, soils, and wetness. Generally speaking, steeper slopes require shorter distances between

diversion structures. The following table contains recommended distances between installed structures depending on slope.

Table 4	
Recommended Distances Between Water Diversion Structures	
Slope (Percent)	Spacing (Feet)
2	250
5	135
10	80
15	60
20	45
30	35

All of these structures should be sized in anticipation of greater flows resulting from snow melt, spring runoff, and storm rains.

Installation

These structures should be installed at 30-degrees angled down grade. The shape of the backside portion of the structure should have a reverse slope of about 3 percent. Use of a pop-level is recommended to ensure that drainage is away from the road. Structures should be constructed with rounded (not vertical) mounds and dips to allow for firm compaction and to allow re-vegetation.

In the case of the cross-drainage culvert, the minimum width of the open face of the culvert should be 18 inches. The travel surface should consist of at least 12 inches of gravel or soil over the culvert. The slope of the culvert should be a drop of at least 5 inches in every 10 feet of length to ensure proper drainage.

The inlet end of all structures should extend beyond the edge of the access road so that it fully intercepts water flows that may flow onto the access road. The outlet end of the structure should extend out enough to prevent water from flowing around and re-entering the road or work area.

The discharge ends of any of these diversion structures should outlet into a vegetated filter strip. Where heavy flows are encountered or anticipated, the outlet end of the structures should incorporate an apron of rock, gravel, or brush to reduce water velocities. If construction will extend into fall and winter months, be sure to upgrade to meet winter standards all erosion control measures (e.g., increase amount of mulch, etc.), to protect the site from spring runoff.

Where the structure is within 100 feet of a stream or wetland, the incorporation of a small, excavated settling basin or ditch turnout to reduce the velocity of flows and the continued movement of sediment downslope should be considered. In addition, some type of sediment barrier (silt fencing or staked hay bales) will be installed at the outlet of the diversion structure, where vegetated filter strips are narrow or sparsely vegetated, in order to prevent sediment from eroding into water resources.

Maintenance

Due to repeated travel over these structures, maintenance is critical to their effective functioning. As the structure becomes flattened or rutted, it needs to be re-excavated or graded to ensure the interception and redirection of water runoff. The ends of any cross-drainage culverts should be maintained by clearing away any potential blockages.

Removal

After the completion of the construction project, removal of these structures is not a requirement, with the exception of the cross-drainage culvert. The structures can be left in place provided they have been suitably stabilized with seed and mulch. Any hay bale barriers or silt fence at the outlet end should be removed when the site has a healthy vegetative cover.

6.0 SEDIMENT BARRIERS (STRUCTURAL MEASURES)

6.1 Introduction

The use of properly installed erosion and sediment control barriers is a fundamental and critical component for preventing erosion at CMP construction projects. Erosion control barriers include silt fence, hay bales, and/or erosion control mix berms. In some cases, these barriers may be deemed unnecessary by CMP, its representatives, or a Third Party Inspector due to factors including slope and filter strip width within project boundaries. A typical CMP construction project will use a combination of barriers to effectively control erosion near water resources. Installation and diligent maintenance of these barriers serves the following purposes:

- Assures the environmental integrity of those upland and water resource areas not designated or permitted for disturbance. Specifically, it maintains the onsite vegetative community and water quality of the surface water within the watershed.
- Assures compliance with all applicable federal, state, and local environmental and land use regulations or permit conditions.

Generally, silt fence is the preferred barrier because: it traps a much higher percentage of suspended sediments than hay bales; it can be easier to install, obtain, and transport; and is less costly. In addition, the structural longevity of silt fence is 60 days or longer unlike straw or hay bales' longevity which is 60 days or less.

The standards and procedures outlined in this section of the manual are meant to address a majority of the situations encountered during transmission line and substation construction activities. For additional information on sediment and erosion control methods and techniques, or to address a particularly problematic situation, this manual should be used in conjunction with and supplemented by the Maine Erosion and Sediment Control BMPs. For other recommended references, see Appendix C.

6.2 Silt Fence

Materials

Silt fence is provided by a number of manufacturers and is generally a synthetic fabric pre-attached to wooden staking. The fabric should be pervious to water allowing a flow through rate of 0.3 gallon per square foot per minute. The fabric should contain stabilizers and ultraviolet ray inhibitors to allow it to sustain exposure of a minimum of 6 months. The height of the filter fabric should not exceed 4 feet in height.

Placement

Silt fence is to be utilized at the edge of any planned work area or area which will cause the disturbance of soil. It will be installed to intercept any sheet flow of water and detain sediment from entering water resources or leaving the project site. It should be installed prior to starting work. Given the expansiveness of CMP transmission line projects in particular, the amount of silt fence placement must be selective; however, it should still be used in amounts sufficient to meet potential changing conditions in a pro-active manner. After the primary stabilization measures (temporary and permanent) have been implemented, silt fence use is encouraged in the following selected locations, as appropriate:

- Around all substation project sites.
- Along all access roads or work areas that are within 100 feet of water resources.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of silt fence is appropriate when:

- Serving a drainage area of no more than .25 acre per 100 feet of silt fence length.
- The maximum slope length behind the fence is 100 feet or less.
- The maximum gradient behind the fence is 50% or 2:1 horizontal/vertical.
- Where the filter strip is not of an adequate width (see Table 1).

Installation

The following installation guidelines are the minimum which should be implemented; however, appropriate changes to silt fence installation should be made as conditions change during the construction operation.

Silt fence will be placed an adequate distance (6-10 feet) beyond the toe of the slope (if there is sufficient room) to allow for sediment accumulation between the disturbed area and the down-gradient water resources. If there is not sufficient room to place the silt fence an adequate distance beyond the toe of the slope, CMP, a representative of CMP, or the Third Party Inspector should be consulted. The barrier should be installed along the contour, within reason. The goal is to slow and pool the sediment-laden runoff to allow fine sediments to settle-out before the runoff enters the water resource. The ends of the barrier should be up-turned to maintain the pool volume.

A trench shall be excavated approximately 6 inches wide and 6 inches deep on the up-slope side of the silt fence alignment. The lower edge of the silt fence fabric should be entrenched for a distance of at least 4 inches up-slope and then back-filled. Should frozen or rocky ground conditions prevent the effective or practical use of trenching, materials such as bark/wood chips, wood fiber mulch, or a soil erosion control mixture can be used. This material is to be mounded on top of at least 4 inches of filter fabric which would otherwise be trenched.

Silt fence should be installed in a continuous roll to avoid the need of a joint between different pieces of fence. If joints are necessary, filter fabric shall be “spliced” together at a support post, securely sealed, and with a minimum of 6 inches of overlap. Splicing rolls of silt fence entails twisting end posts together, creating a continuous section of silt fence.

Support posts should be placed on the down-slope side or the side closest to or facing the water resource. The posts should be placed 6 feet apart (a maximum of 10 feet may be acceptable in some locations) and driven securely into the ground, typically about one foot deep. Silt fence usually has posts pre-attached.

Silt fence should not be installed in streams or drainage ways where concentrated water flow is present or concentrated flows are anticipated.

Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor is responsible for inspecting all temporary erosion and sediment control barriers. Such inspection is necessary to assure that the barriers are functioning properly as well as identifying new areas requiring installation. A maintenance log should be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they will be repaired or replaced. A sediment control barrier is not functioning if:

1. Water is flowing around the sides or under the barrier.
2. Soil has built up behind the barrier to the point more than half-way up the fence.
3. There is excessive sag in the fence.
4. There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the perimeter silt fence.

Corrective measures include removing accumulated sediment from behind the barrier, restaking, extending the ends of the fence, or installing another fence further upslope.

Removal

Installed silt fence will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists. In most cases, the silt fence will not be removed until at least one growing season has past. Removal of silt fence should be coordinated with CMP or their designated representative.

Any ridges or mounds of soil or caught sediment remaining in place after the silt fence has been removed, must be leveled-off to conform to the existing grade. Any newly exposed soil that may erode must be seeded and mulched.

All removed silt fence must be properly disposed of off the project area.

6.3 Hay Bales

Placement

Like silt fence, hay bale barriers can be utilized at the edge of any planned work area or areas where soil disturbance has occurred or will occur. Barriers are installed to intercept sheet flow of water and detain sediment from entering water resources or leaving the project site. Given the expansiveness of CMP transmission line projects in particular, the amount of hay bale barrier placement must be selective, but still in amounts sufficient to meet potential changing conditions in a pro-active manner. Hay bale barriers will be used, as appropriate, in the following locations:

- Around all substation project sites.
- Along all access roads or work areas that are within 100 feet of a water resource area.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of hay bales is appropriate when:

- Serving a drainage area of no more than .25 acre per 100 feet of barrier length.
- The maximum slope length behind the barrier is 100 feet or less.
- The maximum gradient behind the barrier of 50% or 2:1 horizontal/vertical.
- Where the filter strip is not of an adequate width (see Table 1).

Installation

The following installation guidelines are the minimum which should be implemented; however, appropriate changes to hay bale installation should be made as conditions change during the construction operation.

The barrier will be placed an adequate distance (6-10 feet) beyond the toe of the slope (if there is sufficient room) to allow for sediment accumulation between the disturbed area and the down-gradient sensitive areas. If there is not sufficient room to place the hay bales an adequate distance beyond the toe of the slope, CMP, a representative of CMP, the project environmental inspector, or the Third Party Inspector should be consulted. Within reason, the barrier should be installed along the contour. The goal is to slow and pool the sediment-laden runoff to allow fine sediments to settle-out before the runoff enters the water resource. The ends of the barrier should be up-turned to maintain the pool volume.

A shallow trench shall be excavated the width of the bale and to a minimum depth of 4 inches in which to bed the bale. The excavated soils are then used to seal the lower inside (up-slope) edge of the barrier. The bales should be set tightly together and entrenched with the baling string oriented on the sides (i.e., not touching the ground) in order to prevent deterioration of the string.

Every bale should be staked using 2 stakes per bale. The stakes should be driven in at angles such that it binds and forces abutting hay bales together.

Gaps between bales shall be packed with loose hay to prevent water from escaping between the bales.

Hay bales will not be placed in streams where flow is present or anticipated.

Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor is responsible for inspecting all temporary erosion and sediment control barriers. Such inspection is necessary to ensure the structures are functioning properly as well as identifying new areas requiring installation. A maintenance log should be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they must be repaired or replaced. A sediment barrier is not functioning if:

- Water is flowing around the sides or under the barrier.
- Soil has built up behind the barrier to the point more than half-way up the hay bale or where there is excessive lean to the barrier.
- There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the hay bale barrier.

Corrective measures include removing accumulated sediment from behind the barrier, re-staking, extending the barrier at the ends, or installing another barrier further up-slope.

It is not recommended that straw or hay bales be used for periods greater than 60 days.

Removal

Installed hay bales will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists. In most cases, the hay bale barrier will not be removed until at least a healthy growth of vegetation is established on the disturbed site. Removal of hay bale barriers should be coordinated with CMP or their designated representative.

Any ridges, mounds of soil, or caught sediment remaining in place after the hay bales have been removed, must be leveled-off to conform to the existing grade. Any newly exposed soil that may erode must be seeded and mulched.

All removed hay bales must be properly disposed of, or broken up and used as mulch on the bare soils near the barrier.

6.3.1 Problems With Straw or Hay Bale Barriers

There are several situations where straw or hay bale barriers may be ineffective or cause problems:

1. When improperly placed and installed (such as staking the bales directly to the ground with no soil seal or entrenchment), hay bales allow undercutting and end flow.

2. When used in streams and drainage ways, high water velocities and volumes destroy or impair their effectiveness.
3. When bales are not inspected and maintained adequately.
4. When hay bale barriers are removed before up-slope areas have been permanently stabilized.
5. When hay bale barriers have not been removed after they have served their usefulness.

6.4 Erosion Control Mix Berms

Composition

Erosion control mix berms are made up of shredded bark, stump grindings, and composted bark. It may be made on a project site if adequate materials are available, however its composition needs to be a well-graded mix of different particle sizes. Wood chips, bark chips, ground construction debris and processed wood cannot make up the organic component of the mix. Be sure to consult with the project environmental inspector regarding the suitability of any erosion control mix material proposed for use.

Installation

Erosion control mix berms are simply placed on the surface of the ground and do not require any soil disturbance. The berm should be located in a similar manner to other sediment control barriers along contour, downslope of disturbed soils. Also similar to other sediment barriers, they should not be placed in areas of concentrated runoff, below culvert outlets, around catch basins, or at the bottom of a large contributing subwatershed. At the toe of shallow slopes less than 20 feet long, at a minimum berms should be 12" high and a minimum of 2 feet wide at their base. For longer or steeper slopes, the berms should be wider to accommodate additional runoff. They are ideal for installation on frozen ground, on shallow to bedrock soils, outcrops of bedrock, and heavily rooted forested areas (i.e., those areas where other barriers are difficult to install).

Erosion control mix can also be placed in a synthetic "sock" to create a contained stable sediment barrier. This is especially useful in areas where trenching is not feasible, such as frozen ground, across pavement, or compacted gravel. When in a sock, erosion control mix can be staked in an area of concentrated flow (i.e., ditch or swale) as the netting prevents movement of the mulch mixture.

Maintenance

As with other barriers, inspection should be performed after each rainfall or daily during prolonged periods of rain. Accumulations of sediment should be removed when they reach half the height of the barrier, and the berms can be reshaped and new material can be added as needed.

Removal

In most cases, erosion control mix berms do not need to be removed. They will continue to function as they decompose, become part of the soil on the site and will naturally revegetate. If synthetic socks are used, the erosion control mix can be emptied from the sock and the socks can be disposed of offsite.

7.0 NONSTRUCTURAL EROSION CONTROL MEASURES

7.1 Nonstructural Measures Defined

Nonstructural measures are temporary or permanent methods used to cover exposed soil areas to prevent erosion from occurring. Their purpose is to cover whole areas of exposed soil to prevent initial erosion of soil from a construction site.

Examples of nonstructural measures include hay or straw mulch, erosion control mix, matting, or seeding.

7.2 Importance of Nonstructural Measures

Nonstructural measures are important because they provide both temporary and permanent protective cover to exposed soils. Generally, they provide the first line of protection against erosion, and can be the most effective means of preventing erosion. This protection is important because exposed soils are easily eroded by wind or water. Some soils such as silts can easily be removed from a construction site by rainwater. The impact of individual raindrops on exposed soils can loosen soil particles, and these particles can then be carried off the work site by runoff and deposited into water resources including streams, rivers, wetlands, ponds, and lakes. Silt particles don't settle out of water easily, and water siltation can pollute surface waters and harm aquatic creatures such as insects and fish. For example, brook trout, one of Maine's premier game fish species, requires clear, high quality water in order to survive. Silty water can reduce spawning habitat, irritate fish gills, lower oxygen content in water, and make fish susceptible to diseases.

Dry soil conditions and high winds can also cause siltation. When small particle soils such as silts become dry, they have a baby powder-like texture and can easily be swept away by winds. Nonstructural measures help prevent wind erosion because they hold moisture next to the soil, keep the soil from drying out due to wind exposure, and prevent winds from carrying away dry soil particles. Keep in mind, however, that proper construction sequencing is invaluable (See Section 2.3).

7.3 Placement of Nonstructural Measures

Nonstructural measures should be used whenever there is a possibility that exposed soils on a construction site could wash into adjacent sensitive water resources. Temporary nonstructural measures such as hay or straw mulch should be spread on exposed soils within 100-feet of water resources within 48 hours of initial soil disturbance, or before any predicted storm event. There are two types of nonstructural measures: temporary and permanent. Temporary measures are typically used during construction, while permanent measures are usually applied after construction is complete (i.e., restoration). Provided below are general discussions and explanations of the common nonstructural measures that are used on CMP construction sites.

7.3.1 Temporary Measures

- Hay or straw mulch (unanchored on slopes less than 8%, anchored on slopes greater than 8%) on exposed soil areas and soil stockpiles in the construction area.
- Temporary seeding covered by hay or straw mulch on soil stockpiles or areas of exposed soil next to sensitive resources that are not scheduled for final restoration for 30 days (this only applies between the dates of April 16 to October 31 of any given year). Temporary seeding is not required during the Winter Construction Season.
- Erosion control mix can be used as a stand-alone temporary mulch on slopes that are 2 horizontal to 1 vertical, or less, on frozen ground, in forested areas, or at the edge of gravel parking and areas under construction. It should be applied at a thickness of 4 to 6 inches.
- Rolled Erosion Control Products (RECP's) such as Curlex or Jute matting, can be used on areas of high wind exposure, steep slopes (steeper than 8% grade), unstable soils, and stream/river bank restoration areas. Matting is typically anchored (usually with large staples, as recommended by the manufacturer). Although this type of material is usually used during final restoration, it is considered a temporary measure because it generally deteriorates within two years.

Table 5 Temporary Seeding Rates and Dates				
Seed	Lb./Ac	Seeding Depth	Recommended Seeding Dates	Remarks
Winter Rye	112(2.0 bu)	1-1.5 in.	8/15-10/1	Good for fall seeding. Select a hardy species, such as Aroostook Rye.
Oats	80 (2.5 bu)	1-1.5 in.	4/1-7/1 8/15-9/15	Best for spring seeding. Early fall seeding will die when winter weather moves in, but mulch will provide protection.
Annual Ryegrass	40	.25 in.	4/1-7/1	Grows quickly but is of short duration. Use where appearance is important. With mulch, seeding may be done throughout growing season.
Sudangrass Perennial	40 (1.0 bu) 40 (2.0 bu)	.5-1 in. .25 in.	5/15-8/15 8/15-9/15	Good growth during hot summer periods. Good cover, longer lasting than Annual Ryegrass. Mulching will allow seeding throughout growing season.
Temporary mulch with or without dormant seeding			10/1-4/1	Refer to TEMPORARY MULCHING BMP and/or PERMANENT VEGETATION BMP.

Proper application rates, location, and seasonal consideration are provided in Table 6 on page 23 of this manual.

7.3.2 *Permanent Measures*

Uplands

- Permanent grass and legume seeding covered by hay or straw mulch on all areas that have been restored to final grade (this seeding generally applies between the dates of April 16 to October 31 of any given year). This is required to establish permanent, perennial, vegetative cover on exposed soils. Permanent seeding is not required during the Winter Construction Season, although dormant seeding may be performed. (See Section 8.0 for details on winter construction.)
- Seeds covered by anchored (usually with large staples) Curlex or jute matting in areas of high wind exposure, on steep slopes (steeper than 8% grade), unstable soils, and stream/river bank restoration areas.
- The soil may need to be properly prepared before any seeds are placed on the ground. This preparation may include addition of fertilizer (only in designated upland areas not adjacent to, or near waterbodies or wetlands, if in doubt ask the environmental or construction inspector) in areas that have been tested, and are found to be deficient in plant nutrients.
- Erosion control mix can also be used as a permanent mulch to provide a buffer around disturbed areas. It can be left in place to decompose and naturalize. It will eventually support vegetation, which should be promoted. If vegetation is desired in the short-term, legumes and woody vegetation can be planted, which will create additional stability.

Wetlands

- Wetland areas are to be seeded only with resource agency approved wetland seed mixes. If it is decided that wetlands will not be seeded, disturbed wetland will be graded to original contours, mulched with straw, and allowed to revegetate naturally.

As with the Temporary Measures, refer to Table 6 on page 23 for proper application rates, locations, and seasonal considerations.

For permanent seeding mixtures, consult the approved plans/proposal for the project, the environmental inspector, or Appendix A of the Maine Erosion and Sediment Control BMPs.

8.0 WINTER CONSTRUCTION CONSIDERATIONS

If a project is actively being constructed between November 1 and April 15 of any given year, sediment and erosion control guidelines developed by the Maine Department of Environmental Protection for projects occurring during the winter months must be followed.

Of course, nothing can replace good common sense. These guidelines may not be necessary at all times during the winter construction dates for several reasons. For example, if there is no snow on the ground or the ground isn't frozen by November 1, only the standard BMPs must be followed. Also, if the ground thaws and all snow is gone before April 15, the standard BMPs may be appropriate. Nothing substitutes good judgment, being familiar with the construction site, and being aware of the site-specific conditions. Proper construction sequencing (Section 2.3) can greatly minimize environmental impact during winter construction. When in doubt, contact the project construction manager or environmental inspector with any questions.

Table 6 on page 23 highlights some of the major differences between the winter construction guidelines and normal BMPs used during construction and for temporary stabilization. The table presents differences for temporary measures that should be used during construction, and permanent measures when construction is completely done.

Table 6
Nonstructural Erosion Control Measures (Seasonal Differences in Construction BMP Requirements)

Dates	General Construction April 16 through October 31 of every year	Winter Construction November 1 through April 15 of every year
Mulch on slopes less than 8%	Within 100-feet of sensitive water resources apply hay and/or straw mulch at a minimum of 70 lbs./1000 square feet of exposed soil (about 2 bales). Must be done within 7 days of initial soil disturbance and before storm forecasted events, unless specified otherwise.	Within 100-feet of sensitive water resources apply and maintain properly anchored hay and/or straw mulch at a minimum of 150 lbs./1000 square feet of exposed soil (about 5 bales) at all times. (double the April 16 – October 31 rate)
Mulch on slopes greater than 8%	Hay or straw mulch can be applied without being anchored, though specific site conditions may require use of anchoring.	Apply mulch as specified above. Properly anchor with Curlex, jute matting, or similar mulch netting on upland slopes exceeding 8% and within 100 feet of streams if no construction activities are anticipated for 7 or more days.
Area of exposed soils allowed at any one time	No restriction on area exposed, but contractor must attempt to minimize amount of exposed soil at any one time, especially next to water resources.	Not more than one (1) acre of exposed (not mulched or otherwise devoid of vegetative cover) soil.
Sediment barriers	A single line of sediment barriers including silt fence, hay bales, or wood waste filter berms must be installed between water resources and disturbed soils.	If soil is frozen, wood waste filter berms or 2 lines of sediment barriers (including hay bales and silt fence) must be placed between water resources and disturbed soils.
Temporary seeding in uplands	If required, apply at the rate specified by the supplier, CMP Environmental Department, or Environmental Inspector. Cover with mulch.	Not required, but if temporary seeding is desired, it must be applied at a rate 3 times higher than the General Construction Season, and covered with mulch.
Temporary seeding in wetlands	Wetlands are not to be seeded unless done so with an agency-approved seed mix. Annual Rye Grass is not acceptable and shall not be used. Disturbed wetland areas will be mulched exclusively with straw.	Wetlands are not to be seeded unless done so with an agency approved seed mix. Annual Rye Grass is not acceptable and shall not be used. Disturbed wetland areas will be mulched exclusively with straw.
Permanent seeding in uplands	Site must be seeded at rate specified by the supplier and covered with hay or straw mulch. If needed, the site can be limed and fertilized.	Not required before April 16, but if dormant seeding is desired, the site should receive an adequate cover of loam, if necessary, be seeded at a rate 3 times higher than the General Construction Season, and covered with mulch at a minimum of 150 lbs./1000 square feet.
Permanent seeding in wetlands	Do not apply permanent seed mixes to wetland areas unless they are specially designated wetland seed mixes approved by a resource agency.	Do not apply permanent seed mixes to wetland areas unless they are specially designated wetland seed mixes approved by a resource agency.
Temporary seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-10-10 fertilizer may be applied at a rate of 600 lbs./acre and limestone at 3 tons/acre.	Not required, but seedbed can be prepared according to General Construction requirements.

Dates	General Construction	Winter Construction
	April 16 through October 31 of every year	November 1 through April 15 of every year
Permanent seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-20-20 fertilizer may be applied at a rate of 800 lbs./acre and limestone at 3 tons/acre.	Not required before April 16, but if dormant seeding is desired, the seedbed can be prepared according to the General Construction requirements.
Temporary slope stabilization	Same as winter construction season, but mulch does not need to be anchored.	Anchored hay or straw mulch on slopes greater than 8% and drainage ways with greater than 3% slope as necessary. Wood waste mix can be used on slopes in place of anchored hay or straw mulch.
Maintenance of erosion controls	Same as winter construction guidelines.	All erosion controls should be inspected periodically to ensure proper function. If any evidence of erosion or sedimentation is evident, repairs should be made to existing controls or other methods should be used.
Inspection and monitoring	Monitoring should be performed as needed until a new, healthy vegetative cover is attained on the site. This applies to both temporary and permanent seeding.	Monitoring should be performed as needed to ensure proper stabilization and re-vegetation (both temporary and permanent). Starting in the spring following completion of the project, inspections should be performed until new, healthy vegetative cover is attained.

9.0 SITE RESTORATION STANDARDS

Following completion of the construction work, the contractor will be responsible for conducting site restoration work. The following guidelines will apply to all activities, including temporary and permanent roads, stream/wetland crossings, staging and work areas, and substation sites.

9.1 Procedure

At the completion of project construction in an area or at the end of the construction, CMP or their designated representative, the contractor, and any Third Party Inspector will review the project's restoration needs and prioritize the areas. This prioritization should consider time of year, ground conditions, re-vegetation probabilities, and equipment availability. A restoration "walk-through" is strongly recommended.

In many cases a site can and should be restored within hours of when the soil disturbance occurred. Often getting the equipment to a site that needs to be restored only creates more disturbed area to restore. It is important to "restore as you go" to reduce the equipment travel on temporary access roads. It can be particularly difficult to restore an area that was disturbed during winter construction activities in the spring or summer.

Likely areas of restoration include, but are not limited to:

- Around substation construction areas.
- Around pole and anchor pole placement.
- All wetland, stream, or brook crossings, particularly the approaches and any stream banks.
- Drainage ways or ditches.
- All temporary or permanent constructed roads, yarding, and staging areas.
- Cut banks.
- Steep slopes (over 8%).

9.2 Methods for Restoration

There are several methods of restoration for different areas.

1. All soil that is excavated, mounded, or deposited during construction will be re-graded or removed from the site as directed by CMP. All re-grading and redistribution of soil will be done to match existing grade.
2. The banks and bottoms of brooks, streams, and rivers will be restored to natural conditions. In general, any material or structure used at temporary crossings will be removed, and the bank and bottoms restored to their original depth and contour.
3. On permanent access roads, stream culverts and bridges will be left intact and in good repair to remain available for maintenance operations and/or public access (woods roads, camp roads, etc.).
4. On those construction roads to be closed to future vehicle traffic (as determined by CMP), bridges, culverts, and other temporary crossing or water diversion structures will be removed and the banks and bottoms restored to original conditions.

5. Previously installed water bars may remain or new ones will be installed at locations designated by CMP or their designated representative. To prevent accelerated soil erosion, such water bars will be installed on all access and construction roads to be closed to vehicle traffic and on steep sections of permanent roads. Permanent water bars will be constructed to a sufficient height and width to divert the amount of water anticipated at each location as well as to provide some post-project permanence to the site. Water bars on long-term temporary access roads will be constructed in such a manner that they will remain effective and require minimal maintenance, and will be permanently seeded to ensure their long-term stability.
6. All areas severely rutted by construction equipment will be re-graded and permanently revegetated.
7. Upon completion of the project, all disturbed areas will be permanently revegetated or otherwise permanently stabilized. This includes the restoration of all areas disturbed by pole installation, temporary access roadways, permanent access roadways, substation construction, and resource crossings. Restoration is generally assumed to be a well-established vegetative cover. All cut and fill slopes must be revegetated, stabilized with riprap, or stabilized with erosion control mix, as appropriate to the slope conditions.
8. Liming, fertilizing, and seeding requirements for permanent re-vegetation will depend upon the soil type and drainage condition of the site. In the absence of soil tests, permanent seeding will generally be done in accordance with "Procedures for Permanent Seeding for Erosion Control" found in Table 6 on page 23.
9. The contractor will be responsible for the proper maintenance of all revegetated areas until the project has been completed and accepted. Where seed areas have become eroded or damaged by construction operations, the affected areas will be promptly re-graded, limed, fertilized, and re-seeded as originally required.
10. The contractor will perform all erosion control work to the complete satisfaction of Central Maine Power Company before the work is accepted. Central Maine Power Company will base acceptance of the erosion control and stabilization work on a final inspection.

APPENDIX A

DEFINITION OF TERMS

APPENDIX A

DEFINITION OF TERMS

Adjacent to a natural resource: Within 75 feet of, or in a position to wash into, a water resource (river, stream, brook, pond, wetland, or tidal area).

Annual seed mix: Seed mixture largely made up of plants that only persist one growing season.

Brook: Essentially the same as a stream, a water course that has a defined channel, a gravel, sand, rock or clay base, and flows at least part of the year. It may be a dry channel part of the year.

Corduroy: Logs greater than 3 inches in diameter at the small end and at least 18 feet long that are placed perpendicular to travel direction, on approaches to and in wetlands for crossings. The purpose of the logs is to prevent rutting and preserve vegetation root integrity in and adjacent to wetland areas. May also be used on approaches to mats or bridge stream crossings.

Crossing: Any activity extending from one side to the opposite side of a sensitive natural resource whether under, through, or over that resource. Such activities include, but are not limited to, roads, fords, bridges, culverts, utility lines, water lines, sewer lines, and cables, as well as maintenance work on these crossings. Crossings should be done to minimize impact. For example, crossing at a right angle to the resource and finding the driest or narrowest spot is one method for minimizing impact.

Cross-sectional area: The cross-sectional area of a stream channel is determined by multiplying the stream channel width by the average stream channel depth. The stream channel width is the straight-line distance from the normal high water line on one side of the channel to the normal high water line on the opposite side of the channel. The average stream channel depth is the average of the vertical distances from a straight line between the normal high water marks of the stream channel to the bottom of the channel.

Culvert: A pipe or box structure of wood, metal, plastic, or concrete used to convey water.

Erosion: Movement of earthen material by water or wind.

Erosion control blanket (matting): Manufactured material made out of natural or synthetic fiber designed to control movement of earthen material when installed properly.

Erosion control mix: Erosion control mix consists primarily of organic materials such as shredded bark, wood chips, stump grindings, composted bark, or similar materials. Ground construction debris or reprocessed wood products are not acceptable for use in erosion control mix. It contains a well-graded mix of particle sizes and may contain rocks up to 4 inches in diameter. Properly manufactured mix will have organic matter content between 80 and 100 percent (dry weight), 100 percent of particles must pass a 6-inch screen, the organic portion needs to be fibrous and elongated, it may contain only small proportions of silts, clays, or fine sand, and its pH should be between 5.0 and 8.0. Its applications include erosion control berms and mulch.

Erosion control plans: Written guidelines specific to a project or activity, describing various techniques and methods to control erosion for specific construction activities.

Fill: Any earth, rock, gravel, sand, silt, clay, peat, or debris that is put into or upon, supplied to, or allowed to enter a water body or wetland. Material, other than structures, placed in or adjacent to a water body or wetland.

Filter strip: Undisturbed areas of ground consisting of natural vegetation and natural litter such as leaves, brush, and branches, located between a water resource and access road, skid road or trail, or other area of disturbed soil.

Ford: A permanent crossing of a stream utilizing an area of existing, non-erodible substrate of the stream, such as ledge or cobble, or by placing non-erodible material such as stone or geotextile on the stream bottom.

Geotextile, Non-woven: Synthetic material made of spun polypropylene fiber used to support wetland fill or stabilize soils.

Geotextile, Woven: Synthetic material of woven polypropylene used to stabilize soils and make sediment barriers (silt fence).

Great pond: An inland water body which in a natural state has a surface area in excess of 10 acres, and any inland water body which is artificially formed or increased which has a surface area in excess of 30 acres.

Intermittent watercourse: Water course that has water in it only part of the year. It is still considered a natural resource.

Mats: Pre-constructed, portable, timber platforms used to support equipment or travel in or over wetlands or water bodies.

Mulch: Temporary erosion control such as hay, bark, or some similar natural material utilized to stabilize disturbed soil.

Perennial seed mix: Seed mixture made up of seeds from plants that persist for several years.

Perennial watercourse: A river, stream, or brook depicted as a solid blue line on the most recent edition of a United States Geological Survey 7.5 minute series topographic map. Typically has water in it year round.

Permanent access road: Project access road that is not restored after project construction completion. Permanent access roads should be designed and constructed so they are not an erosion problem.

Permanent stabilization: Establishment of a permanent vegetative cover on exposed soils where perennial vegetation is needed for long-term protection.

Permanent vegetative cover: Perennial seed stock, including but not limited to grasses and legumes that persist for more than several growing seasons.

Protected Natural Resource: Coastal sand dune system, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, community public water system primary protection areas, great ponds or rivers, streams, or brooks. (From the Maine Natural Resources Protection Act, 38 M.R.S.A. Section 480-B., revised 2007).

Riprap: Heavy, irregular-shaped rocks that are fit into place, usually without mortar, on a slope in order to stabilize and prevent soil erosion.

Sediment barrier: Staked hay bales, silt fence, or similar materials placed in a manner to intercept silt and sediment laden water runoff.

Sedimentation: Deposition of earthen material in a water body or wetland.

Sensitive Natural Resource: Area that deserves special attention because it is significant wildlife habitat, fisheries habitat, or has other natural resource values. These areas may require the use of minimum impact construction techniques such as use of mats, leaving vegetation intact for buffers, special timing of construction, or other specific techniques.

Settling basin (sediment/catch basin): Excavated pit placed to intercept water running off disturbed soils or dirt road bed. Usually used only where filter strip is inadequate to protect a stream, pond, or wetland from silt and sediment.

Silt fence: Woven geotextile sediment barrier. Proper installation requires placement on-contour and keying the fabric in at ground level.

Steep slopes: Slopes in excess of eight (8) percent.

Stone check dam: A small, temporary dam constructed across a swale or drainage ditch. The purpose is to reduce the velocity of concentrated flows, reducing erosion and trapping sediment generated in the ditch.

Stream: Generally, a channel between defined banks with a gravel, sand, rock, or clay base that flows at least part of the year. It may be a dry channel part of the year. The Maine Natural Resources Protection Act contains a more detailed definition.

Structure: Anything built for the support, shelter, or enclosure of persons, animals, goods, or property of any kind, together with anything constructed or erected with a fixed location on or in the ground. Examples of structures include buildings, utility lines, and roads.

Temporary access road: A road constructed solely for project access which is restored to original grade upon project completion, if not sooner. All areas disturbed by access road construction and use will be stabilized, including road ditches, travel ways, and slopes back to vegetated conditions. In most cases, any roadway ditches associated with temporary access roads should be refilled to reestablish pre-development drainage conditions.

Temporary stabilization: Mulch, matting, or seed, or a combination thereof, utilized to stabilize soil. Soil stockpiles left in place longer than 14 days must have temporary stabilization.

Temporary vegetative cover: An annual seed mixture, typically annual rye and oats.

Topography: The contour and elevation of the surface of the ground.

Turn out: Water diversion that directs water out of a ditch or off a travel-way and into a vegetated buffer.

Upland edge: The area of uplands alongside a wetland, stream, or water body.

Wastes requiring special handling: Wastes generated from construction activity including engine oil, hydraulic oil, gear oil, diesel, gasoline, or coolants.

Water bar: Constructed bar across an access road or skid trail that directs surface water off the road or trail into a stable vegetated surface or filter strip. They are used as a temporary measure on active roads or when closing roads permanently to prevent erosion.

Water body: River, stream, brook, pond, wetland, or tidal area.

Water resource: River, stream, brook, pond, wetland, or tidal area.

Wetland: An area that is inundated or saturated by surface or groundwater at a frequency and for a duration sufficient to support, and which under normal circumstance do support, a prevalence of wetland vegetation typically adapted for life in saturated soils. The Maine Natural Resources Protection Act contains a more detailed definition.

APPENDIX B

CONSTRUCTION MATERIALS SOURCE LIST

APPENDIX B
CONSTRUCTION MATERIALS SOURCE LIST

The following list of vendors has been selected given the wide variety of construction materials they offer. The list is not meant to be all-inclusive or an indication of favored vendors.

W.H. Shurtleff Company (Culverts, Geotextiles)

One Runway Road
Suite 8
South Portland, Maine 04106-6169
1-800-633-6149
www.whshurtleff.com

A. H. Harris (Geotextiles, i.e. Curlex Excelsior Blankets)

22 Leighton Road	585 Riverside Street
Augusta, Maine 04332	Portland, Maine 04103
(207) 622-0821	(207) 775-5764
www.ahharris.com	

North American Green (Erosion control materials)

Maine Distributor:
E.J. Prescott
P.O. Box 600
32 Prescott Street, Libby Hill Business Park
Gardiner, Maine 04345
(207) 582-1851
www.ejprescott.com

New England Organics (Erosion Control Mulch)

135 Presumpscot Street, Unit 1
Portland, ME 04103
1-800-933-6474
www.newenglandorganics.com

APPENDIX C

OTHER RECOMMENDED REFERENCE

MANUALS

APPENDIX C
OTHER RECOMMENDED REFERENCE MANUALS

Maine Erosion and Sediment Control BMPs. Bureau of Land and Water Quality, Maine Department of Environmental Protection, Augusta, Maine. March 2003.
DEPLW0588.

Best Management Practices for Forestry: Protecting Maine's Water Quality. Maine Forest Service, Augusta, Maine. 2004.
www.maine.gov/doc/mfs/pubs/bmp_manual.htm

Forest Transportation Systems: Roads and Structures Manual. Seven Islands Land Company, Bangor, Maine. Third Edition, 1999.

APPENDIX D

CONSTRUCTION TECHNIQUE ILLUSTRATIONS

CULVERT CROSSING



IMPROPER INSTALLATION

- Culvert is undersized, allowing overflow to cross travel-way
 - Insufficient cover thickness over culvert
 - Outlet is not stable, leading to erosion
- Culvert outlet is set too high causing it to be impassable to fish and other aquatic organisms



PROPER INSTALLATION

- Culvert is adequately sized for flow
- Sufficient cover thickness over culvert
- Inlet and outlet are adequately supported by gravel and rock to protect and maintain stability
- Outlet is properly seated at or below stream bottom allowing aquatic organisms to access upstream

CRANE MATS – WATERBODY CROSSING



IMPROPER INSTALLATION

- Mats not long enough to keep equipment out of water and wetland soils
 - Lacks cross supports which elevate travel mat
- Mats do not extend far enough to protect wetland soils from rutting



PROPER INSTALLATION

- Mats are elevated by cross-supports on stream banks, keeping them up out of water and out of wet soils
 - Water flows under mats
- Mats extend over approaches to crossing protecting soils from rutting and eroding
 - Equipment stays out of water and wetlands

CRANE MATS – WETLAND CROSSING



IMPROPER INSTALLATION

- Long axis of mats is not perpendicular to travel direction
- Mats are working down into wetland causing significant disturbance and picking up mud
 - Mats do not extend beyond wetland edge to solid ground



PROPER INSTALLATION

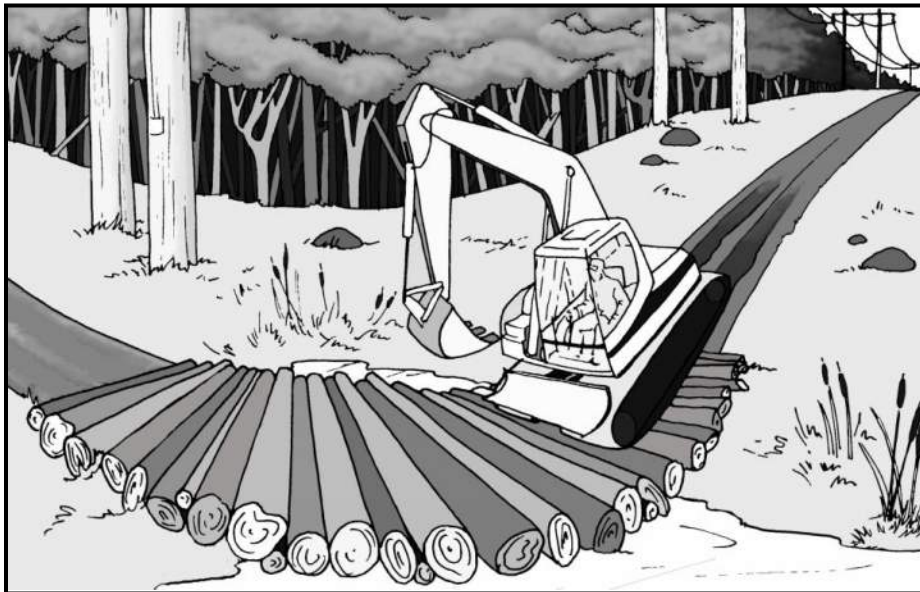
- Correct orientation relative to travel direction
- Entire wetland is spanned, preventing rutting at ends of crossing

CORDUROY CROSSING



IMPROPER INSTALLATION

- Insufficient corduroy to support equipment
 - Corduroy is sunken into wetland soil
- Approaches are steep, rutted, and are not protected with additional corduroy or slash
 - Flow is interrupted, and water is soiled with mud and silt



PROPER INSTALLATION

- Adequate amount of layered corduroy to protect soil from rutting
- Approaches are protected from rutting by extension of corduroy beyond edges of crossing

- Flow is maintained and water is clear of mud and silt

WATER BARS



IMPROPER INSTALLATION

- Flow directed to uphill side on upper bar
 - Angle of lower bar is too shallow
- Lower bar does not extend far enough, allowing water to escape around ends
 - Bars are not high enough, allowing water to flow over top, eroding them

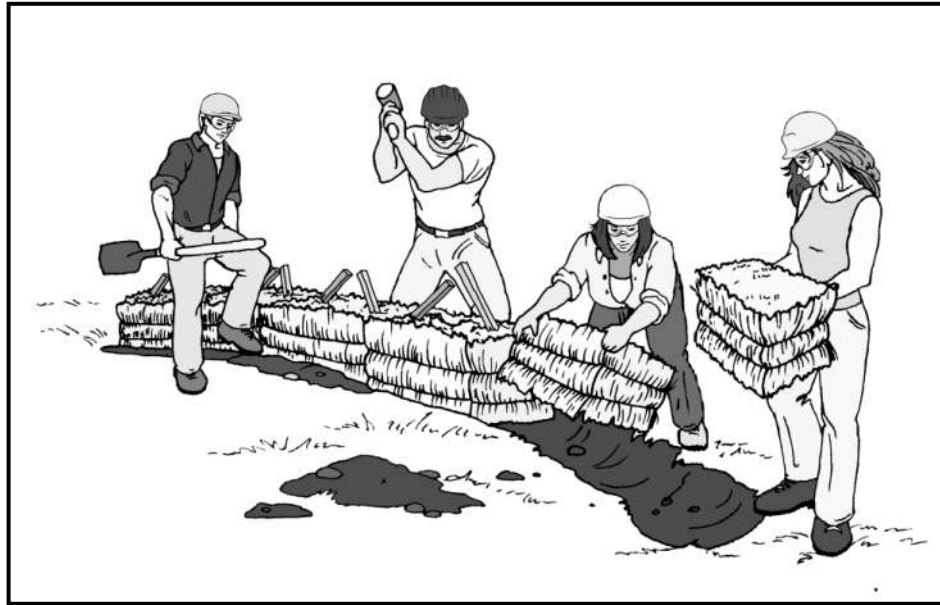


PROPER INSTALLATION

- Bars are at moderate angles
 - There are enough bars to divert all water flowing down road
 - Bars are high enough to prevent water from flowing over them

- **Bars extend beyond edges of road, preventing water from flowing around them**

SEDIMENT BARRIER – HAY BALES
PROPER INSTALLATION



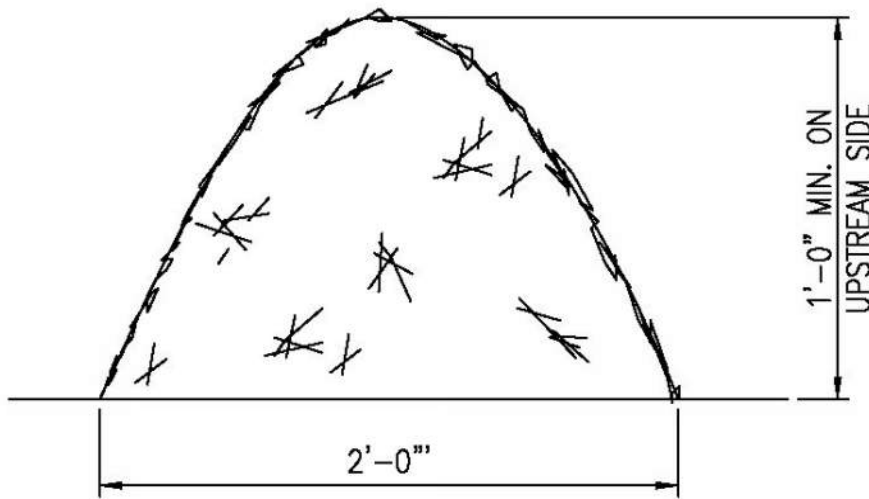
- Dug trench to key bales into ground
- Stakes placed and driven in at angles to snug bales together
 - Excess dirt used to cover openings and cracks

SEDIMENT BARRIER – SILT FENCE
PROPER INSTALLATION



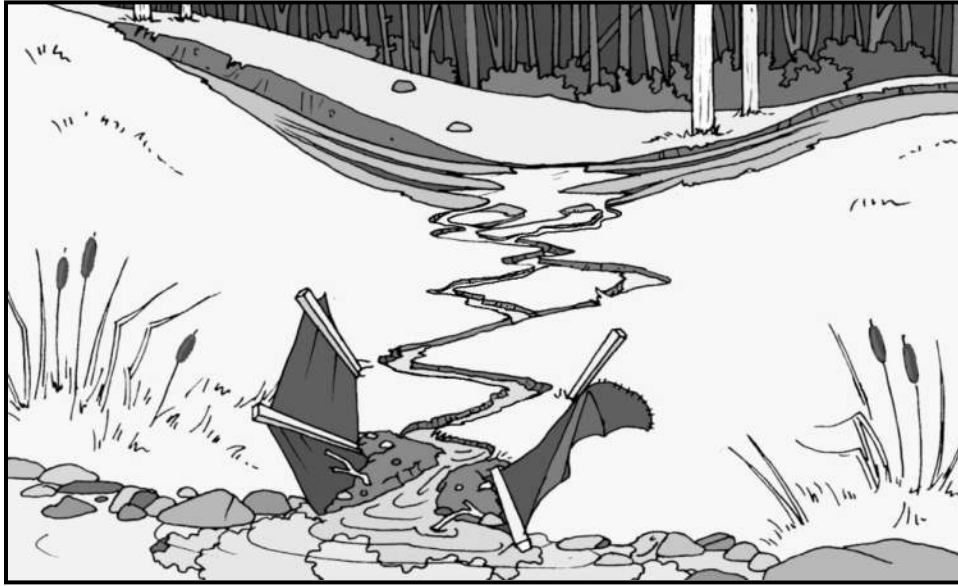
- Dug trench to key material into ground
- Stakes are placed facing away from disturbed area
- Excess material on bottom is buried with excess dirt to prevent water from flowing under fence

EROSION CONTROL MIX BERM DETAIL



- Use erosion control mix berm in place of silt fence and/or hay bale sediment barriers
- Erosion control soil/bark mix shall consist of: shredded bark, stump grindings, composted bark or flume grit and fragmented wood generated from water-flume log handling systems. The mix shall conform to the following:
 1. pH: 5.0 to 8.0
 2. Screen Size: 6" – 100% passing
¾" – 70% to 85% passing
Mix shall not contain large portions of silts, clays or fine sands
 3. Organic material: 20% - 100% (dry weight basis)
Organic portion must be fibrous and elongated
 4. Soluble salts shall be <4.0 mmhos/cm

SEDIMENT BARRIER – SILT FENCE



IMPROPER INSTALLATION

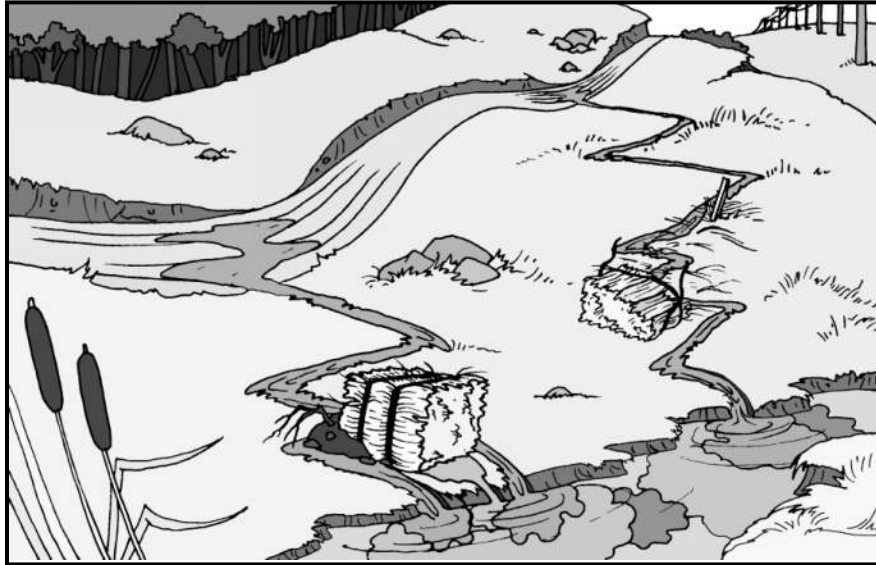
- Fence located too far from road and too close to resource
 - Stakes installed on wrong side of fence
- Needs maintenance (restaking, restapling, or even replacement)
 - Placed in concentrated flow



PROPER INSTALLATION

- Adequate distance from road and resource allows road to capture and slow water, and allows silt fence to filter it before reaching resource
 - Stakes placed on correct side; facing resource, while filter fabric faces disturbed area
- Adequate length; fence is long enough and turned uphill at ends to prevent water from escaping around edges

SEDIMENT BARRIER – HAY BALES



IMPROPER INSTALLATION

- Placed in concentrated flow
 - Hay bales are not staked
- Not enough hay bales to adequately capture and slow flow
 - Too far from source of runoff and sediment
- Improper orientation of bales; horizontal grass fibers do not provide adequate filtration, and strings on ground rot and bales to fall apart



PROPER INSTALLATION

- Staked properly; bales are secure and snug to one another
- Sufficient number of bales to slow flow and insure that no water escapes around edges
- Positioned close to disturbance, and far from resource to allow proper filtration
 - Vertical orientation of grass fibers provides adequate filtration
 - Placed along contour to capture sheet flow

APPENDIX E
EROSION AND SEDIMENTATION CONTROL LAW* 38
M.R.S.A. § 420-C

APPENDIX E
EROSION AND SEDIMENTATION CONTROL LAW*
38 M.R.S.A. § 420-C

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in section 480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken and the site must be maintained to prevent unreasonable erosion and sedimentation.

This section applies to a project or any portion of a project located within and organized area of this State. This section does not apply to agriculture fields. Forest management activities, including associated road construction or maintenance, conducted in accordance with applicable standards of the Maine Land Use Regulation Commission, are deemed to comply with this section. This section may not be construed to limit a municipality's authority under home rule to adopt ordinances containing stricter standards than those contained in this section.

* The Erosion and Sedimentation Control Law is administered by the Maine Department of Environmental Protection (MDEP), Augusta, Maine. Please contact the MDEP with specific questions regarding this law.

APPENDIX F
MAINE SLASH LAW* 12 M.R.S.A. § 9333

APPENDIX F
MAINE SLASH LAW^{*}
12 M.R.S.A § 9333

§9333. Disposal along railroad and utility lines

1. **Stumpage owner.** *A stumpage owner, operator, landowner or agent who cuts or causes or permits to be cut any forest growth on lands that are within or border the right-of-way of a railroad, a pipeline, or an electric power, telegraph, telephone or cable line may not place slash or allow it to remain on the ground within the right-of-way or within 25 feet of the nearer side of the right-of-way.*

2. **Construction.** *Slash accumulated by the construction and maintenance of a railroad, a highway, a pipeline or electric power, telegraph, telephone or cable line may not be left on the ground but must be hauled away, burned or chipped. Slash may not be left or place within the right-of-way or within 25 feet of the nearer side of the right-of-way. If a burning permit is denied or revoked under this chapter, the director may allow logs that are too large to be chipped to remain in the right-of-way until the director determines that their removal is economically feasible.*

3. **Utility line maintenance.** *Slash accumulated by the periodic maintenance of a pipeline or an electric power, telegraph, telephone or cable line may be disposed of in the following manner.*

- A. *Slash with a diameter of 3 inches or less may be left in piles on the ground within the maintained portion of the right-of-way. A pile may not be higher than 18 inches from the ground or longer than 50 feet and must be separated from other piles by a minimum of 25 feet in every direction. A buffer strip with a minimum width of 10% of the total width of the maintained right-of-way must be kept totally free of slash with a diameter of 3 inches or less.*
- B. *Slash with a diameter of more than 3 inches must be removed, chipped or limbed and placed on the ground surface. The pieces must be separated and may not be piled one piece over another. Slash of this size may be left within the maintained buffer strips.*
- C. *If a utility line right-of-way is adjacent to a road, slash that is 3 inches or less in diameter must be removed, burned or chipped. Slash with a diameter of more than 3 inches may be left on the ground within the right-of-way and must not be limbed and separated and may not be piled one piece over another. Usable timber products generated from the maintenance of a utility right-of-way may be piled within the right-of-way but must be removed within 30 days.*

^{*} Note that this is an excerpt from the full text of the law. Please contact the Maine Forest Service, Augusta, Maine, for the full text of the law or with specific questions regarding the Slash Law.

APPENDIX G

CULVERT SIZES FOR STREAM CROSSINGS

(3X RULE)

CULVERT SIZES (ROUND) FOR STREAM CROSSINGS (3x RULE)

AVERAGE STREAM WIDTH

Take two measurements across the stream from bank to bank where you intend to place the culvert. Measurements should be taken at the normal high water line (NHWL). To find the NHWL during low flow periods look for water stains on rocks or a debris line along the bank. Add the first measurement to the second and divide this number by 2. This equals the average stream width.

Example: 36in. + 47 in. = 83in. $83 \div 2 = \text{avg. stream width of 41.5 inches. (Round up to 42in.)}$

AVERAGE STREAM DEPTH

Take 3 measurements from the bottom of the stream to the NHWL.

Add the measurements together and divide this number by 3. This equals the avg. stream depth.

Example: 12in. + 16in. + 14in. = 42in. $42 \div 3 = \text{average stream depth of 14 inches.}$

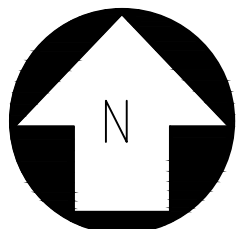
USING THE TABLE

Take the average width and depth figures and determine where they intersect on the table above.

*For example, for an average stream width of 42 inches (on the left side of the table), and an average stream depth of 14 inches (along the top of the table), the intersect shows a culvert diameter of 48 inches.

Average Stream Width		Average Stream Depth (Inches)														
Feet	Inches	2	4	6	8	10	12	14*	16	18	20	22	24	26	28	30
1	12	12	15	18	21	21	24	30	30	30	30	36	36	36	36	42
1.5	18	12	18	21	24	30	30	36	36	36	42	42	42	42	48	48
2	24	15	21	24	30	30	36	36	42	42	48	48	48	54	54	54
2.5	30	15	21	30	30	36	42	42	48	48	48	54	54	60	60	60
3	36	18	24	30	36	42	42	48	48	54	54	60	60	60	66	66
3.5	42*	18	30	36	36	42	48	48	54	54	60	60	66	66	72	72
4	48	21	30	36	42	48	48	54	54	60	66	66	66	72	72	78
4.5	54	21	30	36	42	48	54	54	60	66	66	72	72	78	78	84
5	60	21	30	42	48	48	54	60	66	66	72	72	78	78	84	84
5.5	66	24	36	42	48	54	60	60	66	72	72	78	78	84	84	90
6	72	24	36	42	48	54	60	66	66	72	78	78	84	90	90	96
6.0	78	24	36	42	54	60	60	66	72	78	78	84	90	90	96	96
7	84	30	36	48	54	60	66	72	72	78	84	84	90	96	96	102
7.5	90	30	42	48	54	60	66	72	78	84	84	90	96	96	102	102
8	96	30	42	48	54	66	66	72	78	84	90	90	96	102	102	108
8.5	102	30	42	48	60	66	72	78	84	84	90	96	102	102	108	108
9	108	30	42	54	60	66	72	78	84	90	96	96	102	108	108	114
9.5	114	30	42	54	60	66	72	78	84	90	96	102	102	108	114	114
10	120	30	48	54	66	72	78	84	90	96	96	102	108	114	114	120
10.5	126	36	48	54	66	72	78	84	90	96	102	108	108	114	120	120
11	132	36	48	60	66	72	78	84	90	96	102	108	114	114	120	126
11.5	138	36	48	60	66	78	84	90	96	102	108	108	114	120	126	126
12	144	36	48	60	66	78	84	90	96	102	108	114	120	120	126	132
12.5	150	36	48	60	72	78	84	90	96	102	108	114	120	126	132	132
13	156	36	54	60	72	78	90	96	102	108	114	114	120	126	132	138
13.5	162	36	54	66	72	84	90	96	102	108	114	120	126	132	132	138
14	168	36	54	66	72	84	90	96	102	108	114	120	126	132	138	144
14.5	174	36	54	66	78	84	90	96	108	114	120	126	126	132	138	144
15	180	42	54	66	78	84	96	102	108	114	120	126	132	138	144	144

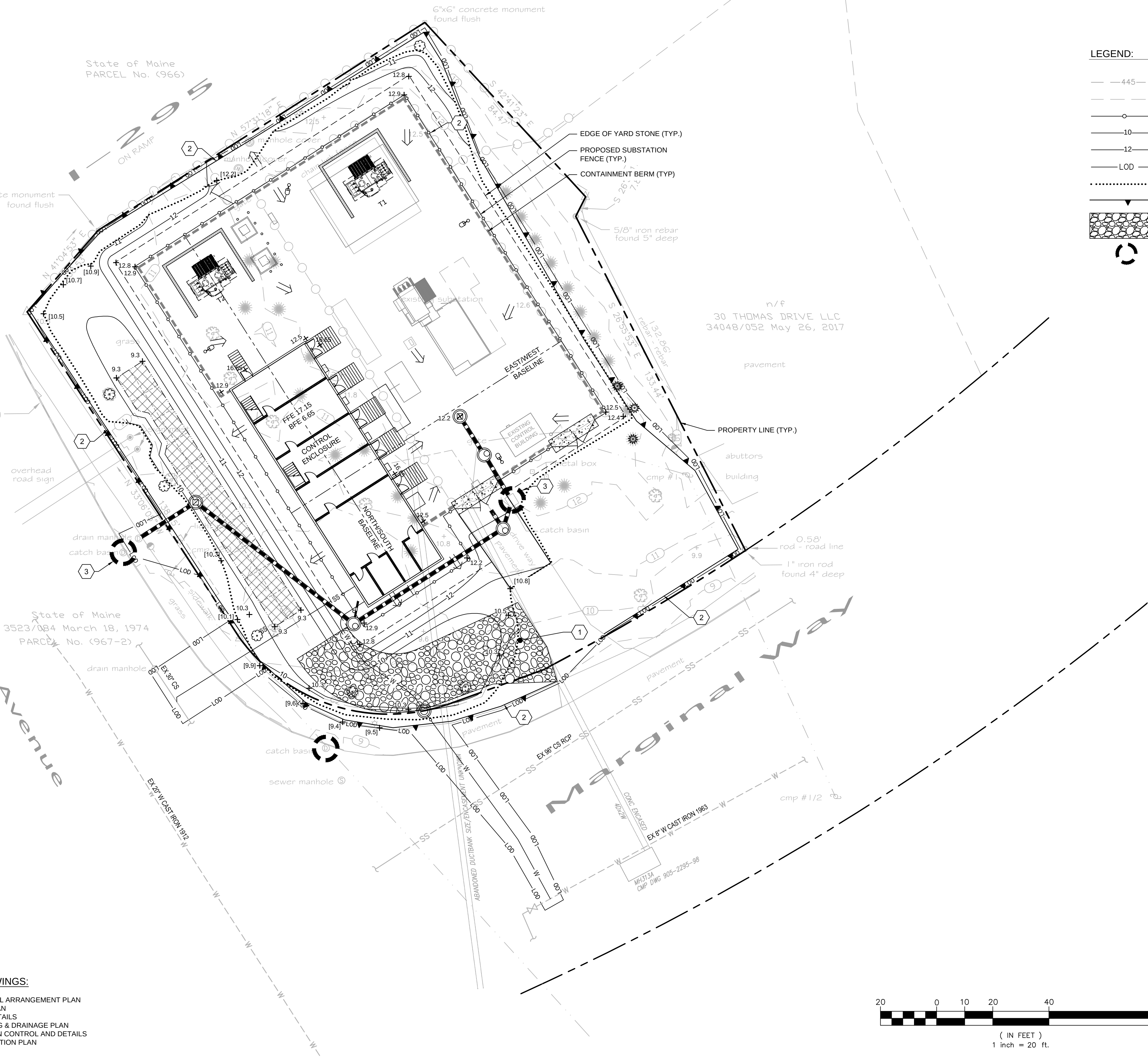
APPENDIX F – EROSION AND SEDIMENT CONTROL PLAN & DETAILS



State of Maine
3523/084 March 18, 1974
PARCEL No. (967-3)

State of Maine
PARCEL No. (966)

n/f
30 THOMAS DRIVE LLC
34048/052 May 26, 2017



KEY NOTES:

- 1 PROVIDE STABILIZED CONSTRUCTION ENTRANCE, REFER TO DRAWING 548-3-5 SH 2, DETAIL EC5
- 2 PROVIDE SILT FENCE, REFER TO DRAWING 548-3-5 SH 2, DETAIL EC3
- 3 PROVIDE INLET PROTECTION, REFER TO DRAWING 548-3-5 SH 2, DETAIL EC4

LEGEND:

- 445 — EXISTING MAJOR CONTOUR
- — — EXISTING MINOR CONTOUR
- o — o — FENCE
- 10 — FINISHED GRADE MAJOR CONTOUR
- 12 — FINISHED GRADE MINOR CONTOUR
- LOD — LIMITS OF DISTURBANCE
- GRADING DAYLIGHT
- ▽ — SILT FENCE OR EQUIVALENT
- CONSTRUCTION ENTRANCE
- CATCH BASIN INLET PROTECTION

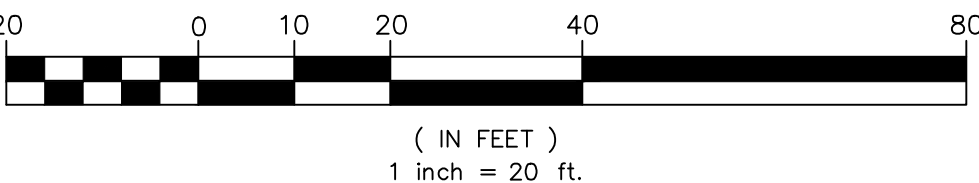
CONSTRUCTION SEQUENCE

1. ESTABLISH CONSTRUCTION WORKSPACE LIMITS; IDENTIFY AND MARK SENSITIVE RESOURCES.
2. PERFORM ALL WORK IN ACCORDANCE WITH MAINE EROSION CONTROL AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS (2016 REVISION), LOCAL MUNICIPALITY REQUIREMENTS, AND CENTRAL MAINE POWER ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES ON TRANSMISSION LINE AND SUBSTATION PROJECTS.
3. PRIOR TO USAGE, CONSTRUCT AND STABILIZE A CONSTRUCTION ENTRANCE WITH A STONE PAD, MUD RACK, OR OTHER MATERIALS USED TO REDUCE THE TRACKING OR FLOWING OF SEDIMENT OFF THE SITE AND MAINTAIN UNTIL CONSTRUCTION IS COMPLETED.
4. CLEAR TIMBER AND BRUSH; DO NOT GRUB UNTIL JUST PRIOR TO PRELIMINARY GRADING.
5. INSTALL AND MAINTAIN SEDIMENT BARRIERS SUCH AS SILT FENCING AND/OR OTHER EROSION CONTROL BARRIERS ALONG THE DOWNHILL LIMIT OF WORK, AS SHOWN ON THE DRAWINGS. SEDIMENT BARRIER LOCATIONS MAY BE ADJUSTED IN THE FIELD BASED ON SITE CONDITIONS AS DETERMINED BY THE ENGINEERING INSPECTOR. WHERE SILT FENCE CANNOT BE TOED-IN PROPERLY DUE TO TREE ROOTS, ROCKS OR FROZEN GROUND, HAY BALES OR AN EROSION CONTROL MIX BERM MAY BE SUBSTITUTED. SILT FENCING WILL BE INSTALLED AFTER CLEARING BUT PRIOR TO GRUBBING AND GRADING ACTIVITIES. ANY EROSION ISSUES DEVELOPED DURING CLEARING WILL BE TEMPORARILY STABILIZED AS NECESSARY.
6. INSTALL AND MAINTAIN CATCH BASIN INLET PROTECTION AT THE LOCATIONS INDICATED OR AS DIRECTED BY THE ENGINEERING INSPECTOR.
7. STABILIZE TEMPORARY PARKING AREAS AND EQUIPMENT STORAGE AND LAYDOWN AREAS WITH MATTING, CRUSHED STONE OR GRAVEL SUBBASE AS NECESSARY TO MINIMIZE RUTTING AND AVOID PONDING.
8. CONCURRENT WITH INITIATION OF SITE GRADING, CONSTRUCT AND STABILIZE TEMPORARY DRAINAGE SWALES, DIVERSION BERMS, CHECK DAMS, CULVERTS AND TEMPORARY SEDIMENTATION BERMS WITH TEMPORARY INLET AND OUTLET STRUCTURES AS NECESSARY TO MINIMIZE SEDIMENT IN SITE RUNOFF DURING THE CONSTRUCTION. DEWATER IN ACCORDANCE WITH DEWATERING NOTES.
9. MINIMIZE THE AMOUNT OF DISTURBANCE AT ANY ONE TIME BY STAGING CONSTRUCTION AS MUCH AS PRACTICAL FOR EFFICIENT CONSTRUCTION OF THE FACILITY. NATURAL VEGETATION BUFFERS OR STRIPS SHOULD BE LEFT IN PLACE WHERE FEASIBLE TO AID IN SEDIMENT RETENTION AND REDUCE EROSION POTENTIAL.
10. REDUCE THE STABILIZED CONSTRUCTION ENTRANCE SIZE AS NEEDED AS GRADING AND EQUIPMENT INSTALLATION PROGRESSES IN THE AREA WITHIN THE GRADING DAYLIGHT LINE AS SHOWN ON THE PLAN. MAINTAIN THE GREATEST SIZED CONSTRUCTION ENTRANCE FOOTPRINT FOR THE LONGEST DURATION POSSIBLE.
11. STABILIZE ANY NEWLY GRADED SLOPE GREATER THAN EIGHT PERCENT USING ANCHORED EROSION CONTROL BLANKETS OR OTHER APPROVED MULCHING TECHNIQUES WITHIN 24 HOURS. STABILIZE ANY SLOPE EXCEEDING EIGHT PERCENT AND BROUGHT TO FINAL GRADE WITHIN 24 HOURS USING THE APPROVED PERMANENT STABILIZATION MEASURES FOR SLOPES.
12. EROSION CONTROL BLANKETS, NETTING OVER LOOSE MULCH OR EROSION CONTROL MIX AS SPECIFIED IN THE MAINE ESC MANUAL MAY BE APPLIED TO ALL VEGETATED SLOPES EQUAL TO OR GREATER THAN 3:1. ALTERNATIVE MEASURES MAY ONLY BE USED WITH MDEP APPROVAL.
13. DUST CONTROL METHODS WILL BE EMPLOYED AFTER GRADING AND PRIOR TO FINAL STABILIZATION TO PREVENT THE BLOWING AND MOVEMENT OF DUST THROUGH THE APPLICATION OF WATER AND/OR CALCIUM CHLORIDE TO REDUCE WIND EROSION. REPETITIVE TREATMENT SHALL BE APPLIED AS NEEDED TO ACCOMPLISH CONTROL.
14. APPLY TEMPORARY SEED AND MULCH TO ANY EXPOSED AREAS WHERE ACTIVITY IS NOT ANTICIPATED FOR 30 DAYS OR MORE, OR WHERE ACTIVITY HAS NOT OCCURRED WITHIN 30 DAYS. TEMPORARILY MULCH ANY EXPOSED AREAS OR UNSTABILIZED AREAS WITHIN 100 FEET OF STREAMS, WETLANDS, AND OTHER WATER RESOURCES WHERE ACTIVITY IS NOT ANTICIPATED OR HAS NOT OCCURRED IN 7 DAYS, AND PRIOR TO ANY STORM EVENT.
15. REMOVE EXCESS SPOILS FROM SITE THAT WILL NOT BE USED FOR THE FINAL DESIGN AND STABILIZATION. STOCKPILED SOILS THAT REMAIN IN PLACE FOR 48 HOURS OR MORE WILL BE CONTAINED WITH SEDIMENT BARRIERS SUCH AS SILT FENCE, HAY BALES OR EQUIVALENT. THE SEDIMENT BARRIERS SHALL BE ADEQUATELY LOCATED AND REINFORCED TO HANDLE A SIGNIFICANT RAIN EVENT AND THE POTENTIAL SLUMPING OF THE PILE. BETWEEN APRIL 15 AND OCTOBER 1, APPLY TEMPORARY SEED AND MULCH TO A STOCKPILE THAT IS NOT EXPECTED TO BE DISTURBED WITHIN 30 DAYS. APPLY ANCHORED MULCH DAILY, AS NEEDED, DURING WINTER CONSTRUCTION.
16. INSPECT AND REPAIR EROSION CONTROL MEASURES DAILY IN AREAS OF ACTIVE CONSTRUCTION; OTHERWISE WEEKLY AND AFTER RAINFALL OF 1/2 INCH OR GREATER WITHIN A 24-HOUR PERIOD. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/3 THE HEIGHT OF THE BARRIER.
17. MONITOR PUBLIC ROADS FOR SIGNS OF TRACKING OR SPILLING OF SPOIL MATERIAL AND CLEANUP AS NEEDED.
18. COMPLETE FINAL GRADING AND STABILIZATION OF SWALES OR BUFFER STRIPS THAT WILL CONTROL RUNOFF.
19. FINISH GRADE AND REPLACE TOPSOIL OR LOAM IN DISTURBED AREAS. SEED AND MULCH DISTURBED AREAS WITHIN 6 DAYS OF FINAL GRADING.
20. MAINTAIN ALL TEMPORARY EROSION CONTROLS AND SEDIMENT BARRIERS UNTIL VEGETATION HAS BEEN ESTABLISHED OVER 85-90% OF THE AREA TO BE REVEGETATED. RESEED SPARSLEY VEGETATED AREAS.
21. REMOVE ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ONCE THE SITE IS PERMANENTLY STABILIZED.
22. CLEAN DEBRIS AND REMOVE SEDIMENT FROM STORM DRAIN PIPES AND DRAINAGE STRUCTURES.

PRELIMINARY
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

REFERENCE DRAWINGS:

- | | |
|---------|-----------------------------|
| 548-2-1 | GENERAL ARRANGEMENT PLAN |
| 548-3-1 | SITE PLAN |
| 548-3-2 | SITE DETAILS |
| 548-3-4 | GRADING & DRAINAGE PLAN |
| 548-3-5 | EROSION CONTROL AND DETAILS |
| 548-3-6 | FOUNDATION PLAN |



PE STAMP		AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID				EROSION CONTROL AND DETAILS 34.5 S.G./12KV S.G. S/S SHEET 1 OF 3	
						FOREST AVENUE S/S PORTLAND, ME	
						BY: RLR/BMC SCALE: 1" = 20' FILE: 548-0003-005 SH 001.dwg	
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SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ^{1,2}	APPLICATION RATES
TEMPORARY			
	IF NO ACTIVITY IN EXPOSED AREAS FOR 7 DAYS, OR PRIOR TO A STORM EVENT	STRAW MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 2000 LB./ACRES
ALL DISTRIBUTED AREAS OF THE CONSTRUCTION WORKSPACE	APPLY MULCH TO ALL EXPOSED AREAS IF NO ACTIVITY OCCURS WITHIN 30 DAYS. APPLY MULCH AND TEMPORARY SEEDING SOONER WHEN IT CAN BE ANTICIPATED THAT ACTIVITY IS NOT GOING TO OCCUR WITHIN 30 DAYS.	STRAW MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 2000 LB./ACRES
ALL WORK AREAS EXPOSED ARE TO BE MULCHED DAILY EACH TIME SOIL IS DISTURBED	NOVEMBER 1 - APRIL 15	STRAW MULCH OR WOOD FIBER MULCH	3 TONS/ACRES 2000 LB./ACRES
PERMANENT			
ON ALL EXPOSED AREAS AFTER SEEDING TO STABILIZE THE SOIL SURFACE	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY HAY OR STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 1500 LB./ACRES 2000 LB./ACRES
WOOD CHIP APPLICATION AREAS	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY HAY OR STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 1500 LB./ACRES 2000 LB./ACRES
NOTES: 1. STRAW AND HAY MULCH MAY BE USED INTERCHANGEABLY, EXCEPT IN WETLAND AREAS WHERE STRAW MULCH WILL BE REQUIRED. 2. DOUBLE RATE OF WOOD FIBER MULCH WHEN USED IN CRITICAL AREAS. 3. STRAW, HAY, OR HYDROMULCH (WOOD FIBER OR PAPER MULCH AS APPROPRIATE) WILL PROVIDE 90 PERCENT GROUND COVERAGE 4. PAPER MULCH IS ACCEPTABLE FOR USE DURING THE GROWING SEASON, ON SLOPES >30 PERCENT AND IN AREAS WHERE VEGETATION HAS NOT ESTABLISHED WELL. ADDITIONAL HAY MULCH WILL BE ADDED AS A WINTERIZING MEASURE.			

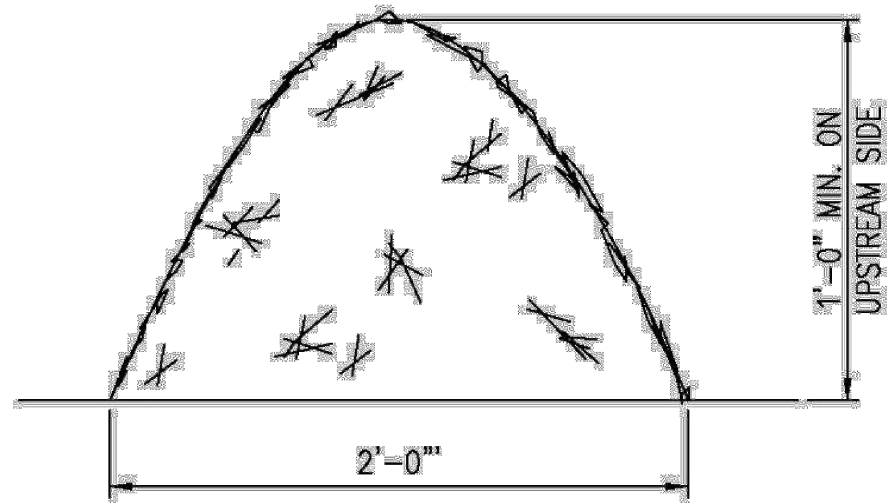
ON SLOPES GREATER THAN 3 PERCENT, HAY OR STRAW MULCH WILL BE FIRMLY ANCHORED INTO THE SOIL. UTILIZING ONE OF THE FOLLOWING METHODS:

- CRIMPING WITH A STRAIGHT OR NOTCHED MULCH CRIMPING TOOL (FARM DISCS WILL NOT BE ALLOWED);
- TRACK WALKING WITH DEEP-CLEATED EQUIPMENT OPERATING UP AND DOWN THE SLOPE (MULCH CRIMPED PERPENDICULAR TO THE SLOPE) ON SLOPES <25 PERCENT;
- APPLICATION OF MULCH NETTING;
- APPLICATION OF 500 LB./ACRE OF WOOD FIBER MULCH OVER STRAW/HAY MULCH; AND
- COMMERCIALLY AVAILABLE TACKIFIERS (EXCEPT WITHIN 100 FEET OF WATERBODIES OR WETLANDS).

SEED MIX SPECIFICATIONS		
SEED MIX NAME	SEED MIX COMPONENTS	LB./ACRE
TEMPORARY SEED MIX	ANNUAL RYEGRASS	40
PERMANENT UPLAND SEED MIX	REDTOP	4
	CREEPING RED FESCUE	40
	TALL FESCUE	40
	BIRDSFOOT TREFOIL	16
WOODCHIP APPLICATION SEED MIX	CREEPING RED FESCUE	20
	REDTOP	4
	TALL FESCUE	4
	CROWNVEITCH	30
WETLAND SEED MIX	ANNUAL RYEGRASS	40
SUPPLEMENTAL WINTER SEED MIX ²	WINTER RYEGRASS	120

NOTES:

1. INCREASE SEEDING RATES 10% WHEN HYDROSEEDING
2. WINTER RYE WILL BE ADDED TO PERMANENT UPLAND MIX AT A RATE OF 120 LB./ACRE BETWEEN OCTOBER 1 AND APRIL 15

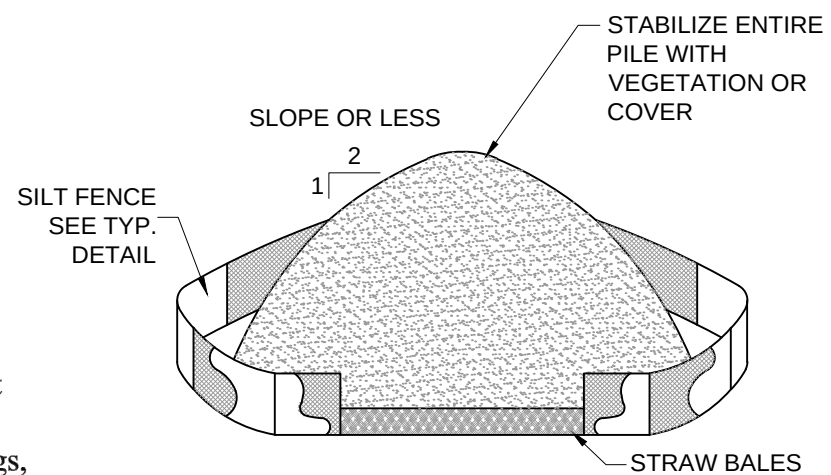


- Use erosion control mix berm in place of silt fence and/or hay bale sediment barriers
- Erosion control soil/bark mix shall consist of: shredded bark, stump grindings, composted bark or flume grit and fragmented wood generated from water-flume log handling systems. The mix shall conform to the following:

1. pH: 5.0 to 8.0
2. Screen Size: 6" – 100% passing
¾" – 70% to 85% passing
Mix shall not contain large portions of silts, clays or fine sands
3. Organic material: 20% - 100% (dry weight basis)
Organic portion must be fibrous and elongated
4. Soluble salts shall be <4.0 mmhos/cm

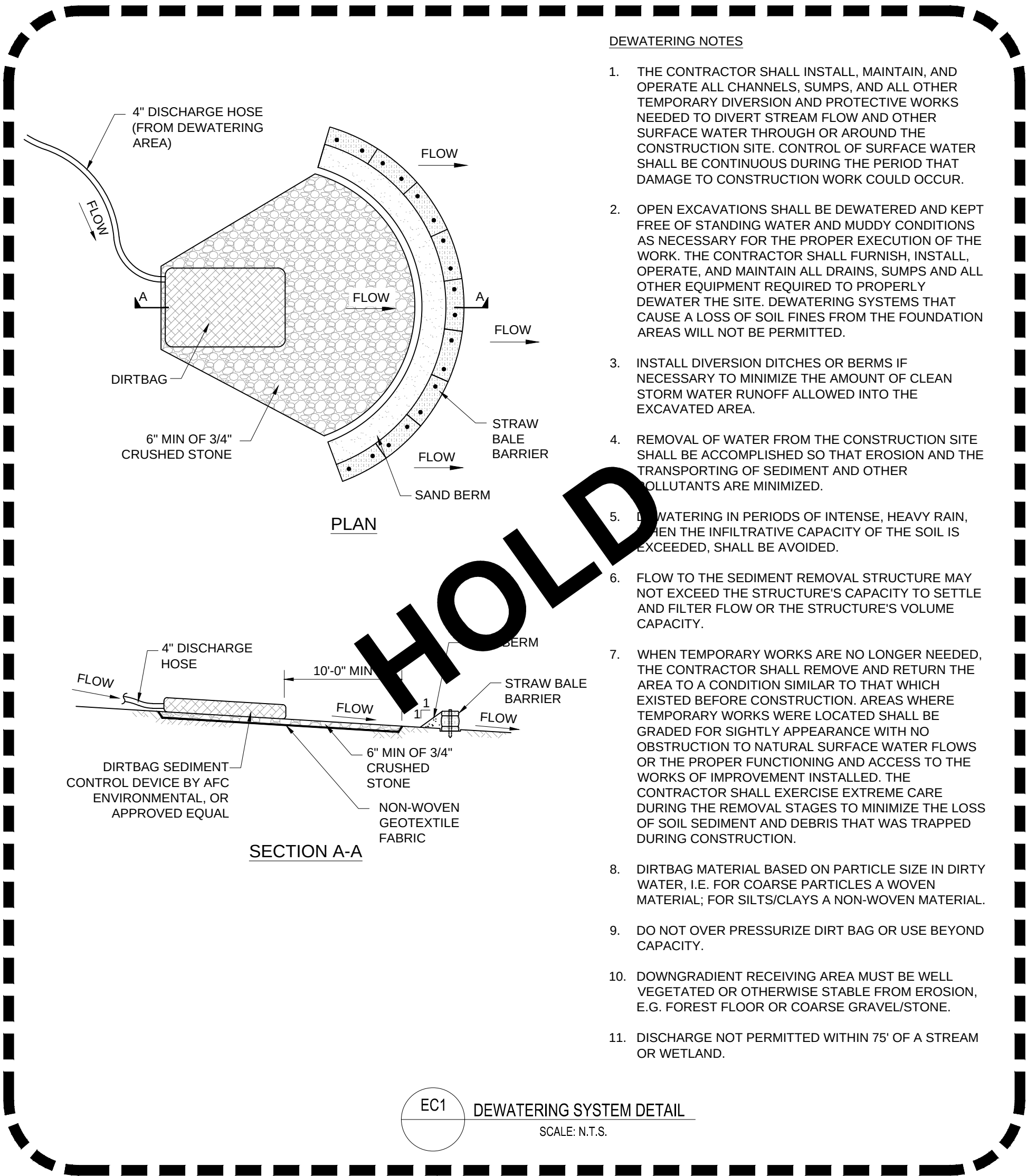
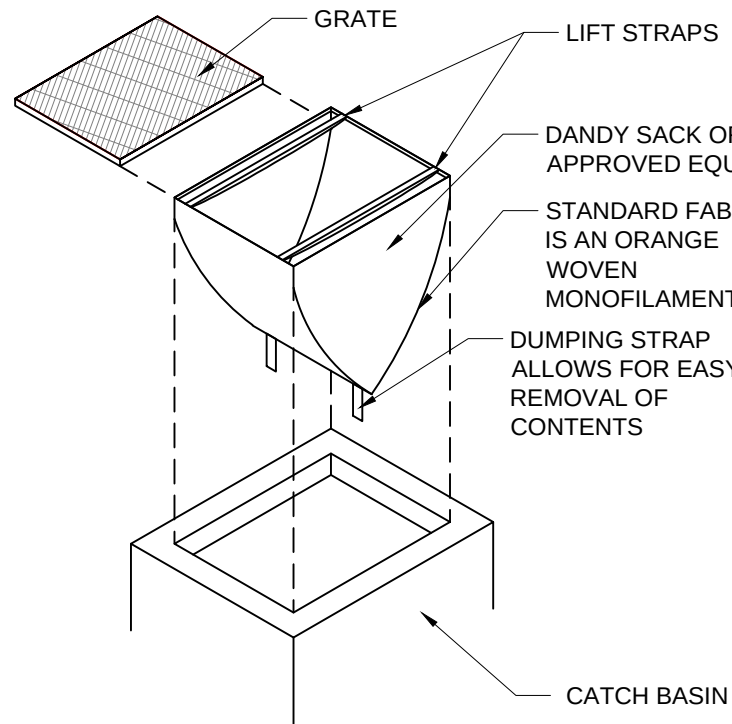
NOTES:

1. DETAIL IS FROM CMP ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES ON TRANSMISSION LINE AND SUBSTATION PROJECTS (EREF-CMP.003) REVISED 8/11/2016.



INSTALLATION NOTES

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAW BALES, THEN STABILIZED WITH VEGETATION OR COVERED.



1. WOVEN WIRE FENCE TO BE FASTENED TO FENCE POSTS WITH WIRE TIES OR STAPLES
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MIDSECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN BUILD-UP REACHES 1/3 THE HEIGHT OF THE FENCE.

POSTS:

FENCE:

FILTER CLOTH:

STEEL "T" OR "U"
TYPE OR 2" HARDWOOD.

WOVEN WIRE. 14
1/2 GA 6"MAX MESH OPENING.

FILTER X, MIRAFL 100X,
STABLINKA T140N OR

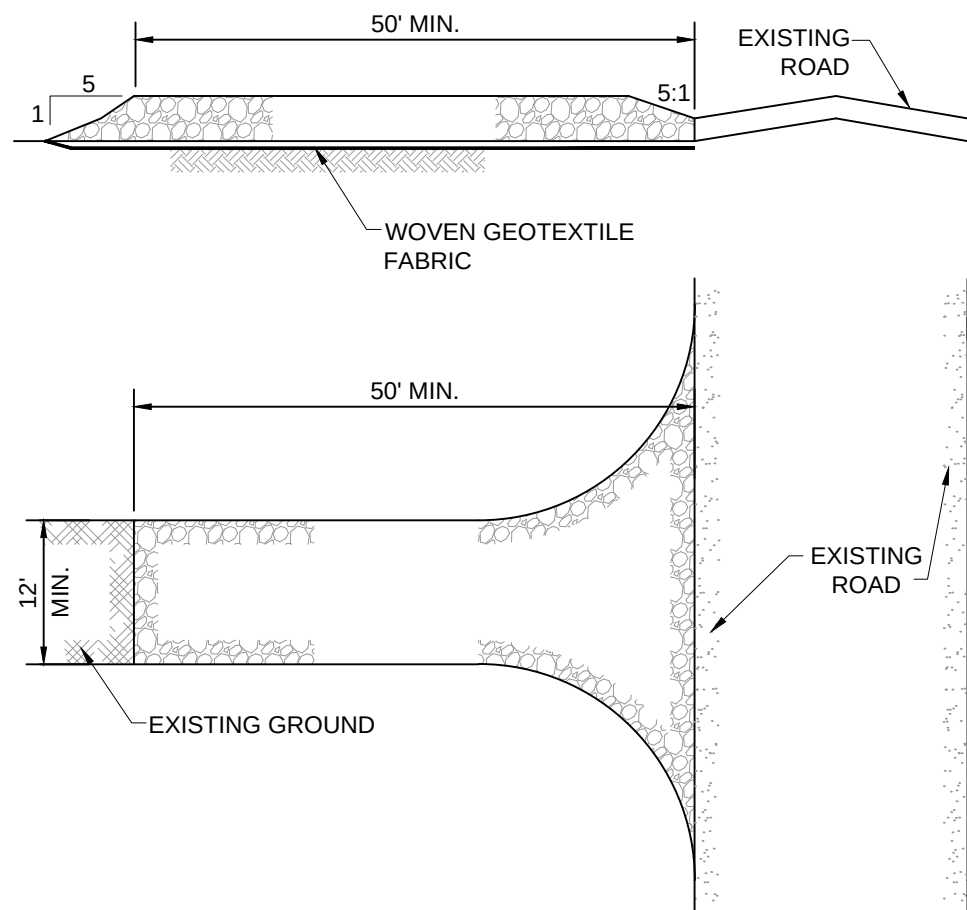
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NOT FOR CONSTRUCTION

SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING ^{1,2}	SEED MIX
TEMPORARY SEEDING ³	TEMPORARY SEED BETWEEN APRIL 15 AND OCTOBER 1 ONLY. DISTURBED AREAS OR SPOIL STOCKPILES WILL BE SEEDED IMMEDIATELY IF FURTHER DISTURBANCE IS NOT EXPECTED FOR 30 DAYS OR MORE.	ANNUAL RYEGRASS
PERMANENT SEEDING ^{3,4}		
UPLAND PORTIONS OF THE CONSTRUCTION AREA SLOPES > 3:1	DISTURBED AREA WILL BE SEEDED WITHIN 6 DAYS OF FINAL GRADING. DISTURBED AREA WILL BE SEEDED IMMEDIATELY AFTER SEEDBED PREPARATION.	PERMANENT UPLAND MIX PERMANENT UPLAND MIX
WETLANDS	DISTURBED WETLANDS WILL BE SEEDED WITHIN 6 DAYS OF FINAL GRADING.	ANNUAL RYEGRASS
WOODCHIP APPLICATION AREAS	DISTURBED AREA WILL BE SEEDED WITHIN 6 DAYS OF FINAL GRADING.	WOODCHIP APPLICATION SEED MIX
WINTER DORMANT SEEDING	DORMANT SEED BETWEEN OCTOBER 1 AND APRIL 15 ONLY. NO SEEDING WILL OCCUR IF SNOW DEPTHS EXCEED 1 INCH.	PERMANENT UPLAND MIX PLUS WINTER RYEGRASS
NOTES: 1. WEATHER CONDITIONS PERMITTING. 2. AREAS THAT DO NOT SUCCESSFULLY REVEGETATE WITHIN APPROPRIATE PERIOD OF TIME SHALL BE RESEEDED AS NECESSARY. 3. LOOSEN COMPACTED SOIL TO A MINIMUM DEPTH OF 4 INCHES. 4. TOP DRESS WITH 6 INCHES LOAM, AS NEEDED.		

IN GENERAL, FERTILIZER AND LIME APPLICATION RATES WILL FOLLOW THE GUIDELINES IDENTIFIED BELOW UNLESS SITE SPECIFIC SOIL TESTS IDENTIFY THE NEED FOR ALTERNATIVE FERTILIZER/LIME APPLICATION RATES. FERTILIZER WILL BE APPLIED TO UPLAND AREAS PRIOR TO SEEDING AT A RATE OF 800 POUNDS PER ACRE USING 10-20-20 (N-P205-K20) OR EQUIVALENT. GROUND LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) WILL BE APPLIED AT A RATE OF 3 TONS PER ACRE. AN EQUIVALENT MIXTURE OF FERTILIZER AND LIME MAY BE APPLIED USING THE HYDROSEEDING METHOD. NO LIME OR FERTILIZER WILL BE APPLIED TO WETLANDS.



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- IF A CONSTRUCTION SITE IS NOT STABILIZED WITH PAVEMENT, A GRAVEL ROAD BASE, 90% MATURE VEGETATION COVER, EROSION CONTROL MULCH OR RIPRAP BY NOVEMBER 1, THEN THE SITE NEEDS TO BE PROTECTED WITH OVERWINTER STABILIZATION. THE WINTER CONSTRUCTION PERIOD IS FROM NOVEMBER 1 THROUGH APRIL 15.
2. WHEN SCHEDULING WORK FOR PERMANENTLY STABILIZED AREAS, PLAN ON APPLYING PERMANENT SEEDING 45 DAYS PRIOR TO FIRST KILLING FROST. SCHEDULING OF WORK SHALL ANTICIPATE THAT VEGETATION WILL NOT GROW PAST OCTOBER 15.
3. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS BEING ACTIVELY WORKED ON AT ANY ONE TIME WITHOUT REGULAR INSPECTION; LIMIT THE EXPOSED AREA TO THOSE AREAS THAT CAN BE MULCHED IN ONE DAY. ALL AREA SHALL BE CONSIDERED DENUDEED UNTIL THE SUBBASE GRAVEL IS INSTALLED IN ROADWAY AREAS OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. A COVER OF EROSION CONTROL MIX PERFORMS THE BEST.
4. ANY ADDED MEASURES, WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION MUST BE PROVIDED AND TAILORED TO SITE CONDITIONS, THE ACTUAL SITE SIZE, SOIL ERODIBILITY, SLOPE, GROUNDWATER, AND WEATHER CONDITIONS.
5. TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION, CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED.
6. FOR CONSTRUCTION OCCURRING AFTER NOVEMBER 1, STABILIZE DISTURBED AREAS DAILY WHILE CONSTRUCTION IS ACTIVE. REPAIR EROSION OR UNCONTROLLED, UNINTENDED DISCHARGES IMMEDIATELY.
7. WHERE SEDIMENT BARRIERS ARE PROPOSED OR REQUIRED, AND ARE LOCATED WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE (WETLANDS, WATERCOURSES, ETC.), PROVIDE A DOUBLE ROW OF SEDIMENT BARRIERS.
8. DURING FROZEN CONDITIONS, SEDIMENT BARRIERS MAY CONSIST OF EROSION CONTROL MIX BERM OR ANY OTHER RECOGNIZED SEDIMENT BARRIERS AS FROZEN SOIL PREVENTS THE PROPER INSTALLATION OF HAY BALES OR SILT FENCES.
9. ALL AREA SHALL BE CONSIDERED TO BE DENUDEED UNTIL SEEDED AND MULCHED. HAY MULCH SHALL BE APPLIED AT A RATE OF 150 POUNDS PER 1,000 SQUARE FEET OR 3 TONS/ACRE (TWICE THE NORMAL ACCEPTED RATE OF 75-LS/1,000 S.F. OR 1.5 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED.
10. MULCH SHALL NOT BE SPREAD ON TOP OF SNOW. REMOVE SNOW PRIOR TO MULCHING.
11. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED OR ADEQUATELY ANCHORED SO THAT GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.
12. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 30, ALL MULCH SHALL BE ANCHORED BY EITHER MULCH NETTING, ASPHALT EMULSION CHEMICAL, TRACKING OR EROSION CONTROL MIX. THE COVER WILL BE CONSIDERED SUFFICIENT WHEN THE GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.
13. AFTER NOVEMBER 1, AT THE END OF EACH CONSTRUCTION DAY, AREAS THAT HAVE REACHED FINAL GRADE MUST BE STABILIZED.
14. STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED FOR OVERWINTER PROTECTION WITH HAY AT TWICE THE NORMAL RATE OR WITH A FOUR-INCH LAYER OF EROSION CONTROL MIX. THIS SHALL BE DONE WITHIN 24 HOURS OF STOCKPILING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL OR SNOWFALL. ANY SOIL STOCKPILE SHALL NOT BE PLACED (EVEN COVERED WITH MULCHED) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.
15. BETWEEN THE DATES OF OCTOBER 1 AND APRIL 15, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES FINISHED AREAS SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER OCTOBER 15 AND IF THE EXPOSED AREA HAS BEEN LOAMED AND FINAL GRADED WITH A UNIFORM SURFACE, THEN AFTER THE FIRST KILLING FROST, THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN COVERED WITH OVERWINTER MULCH OR AN ANCHORED EROSION CONTROL BLANKET.
16. DORMANT SEEDING MAY BE PLACED PRIOR TO THE PLACEMENT OF MULCH OR EROSION CONTROL BLANKETS. IF DORMANT SEEDING IS USED FOR THE SITE, ALL DISTURBED AREAS SHALL RECEIVE 4" OF LOAM AND SEED AT AN APPLICATION RATE 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED. ALL AREAS SEEDED DURING THE WINTER SHALL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS INSUFFICIENTLY VEGETATED (LESS THAN 75% CATCH) SHALL BE REVEGETATED.
17. IF DORMANT SEEDING IS NOT USED FOR THE SITE, ALL DISTURBED AREAS SHALL BE REVEGETATED IN THE SPRING.

- SLOPES GREATER THAN 15% RIPRAP SLOPES MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. VEGETATED SLOPES MUST BE SEEDED AND MULCHED BY SEPTEMBER 1. IF A SLOPE TO BE VEGETATED IS NOT STABILIZED BY OCTOBER 15, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER:

 - a. SOIL WITH ANCHOR NETTING AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND PROTECT WITH EROSION CONTROL BLANKETS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE SLOPE BY NOVEMBER 15, THE SLOPE SHALL BE PROTECTED WITH EROSION CONTROL BLANKET, EROSION CONTROL MIX, OR WITH STONE RIPRAP.
 - b. THE DISTURBED, VEGETATED SLOPE MAY BE STABILIZED WITH PROPERLY INSTALLED SOD. PROPER INSTALLATION INCLUDES PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. DO NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - c. EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 1. DO NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - d. PLACE A LAYER OF STONE RIPRAP ON THE SLOPES BY NOVEMBER 1.
19. BY NOVEMBER 1, ALL VEGETATED AREAS HAVING A SLOPE OF 15% OR LESS MUST BE STABILIZED WITH 90% GRASS COVER. IF THE DISTURBED AREAS ARE NOT STABILIZED BY THIS DATE, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SOIL FOR LATE FALL AND WINTER:
 - a. SEED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET, MULCH THE SEEDED SOIL WITH HAY AT 75 POUNDS PER 1,000 SQUARE FEET, AND ANCHOR THE MULCH WITH NETTING.
 - b. BY NOVEMBER 1, MULCH THE DISTURBED SOIL BY SPREADING HAY AT A RATE OF AT LEAST 150 POUNDS PER 1,000 SQUARE FEET, OR PROVIDE EROSION CONTROL BLANKET OR EROSION CONTROL MIX.
20. 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.
21. VEGETATED DITCHES, CHANNELS, SWALES, OR OTHER AREAS THAT CONCENTRATE AND CONVEY RUNOFF SHALL BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. IF THESE FACILITIES ARE NOT VEGETATED WITH HAY AT LEAST 75% COVER BY NOVEMBER 1, OVEREXCAVATE AND PROVIDE RIPRAP LINING.
22. MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION.
23. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 85 TO 90% OF AREA VEGETATED WITH VIGOROUS GROWTH.
24. STABILIZATION SCHEDULE BEFORE WINTER
 - a. SEPTEMBER 1
 - ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED.
 - SLOPES MUST BE STABILIZED, SEEDED AND MULCHED.
 - ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET.
 - b. OCTOBER 1
 - APPLY SEEDING FOR TEMPORARY VEGETATION TO PREPARE FOR WINTER CONDITIONS.
 - c. NOVEMBER 15
 - SLOPES TO BE COVERED WITH RIPRAP MUST HAVE RIPRAP INSTALLED.
 - DITCHES, CHANNELS, SWALES, ETC. WITHOUT 75% VEGETATIVE COVER SHALL BE MULCHED WITH RIPRAP.
 - ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVERWINTER.

CONTRACTOR SHALL PROVIDE INSPECTION IN ACCORDANCE WITH THE FOLLOWING:

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X
CATCH BASIN SYSTEMS			
Catch basins are built properly	X		
Accumulated sediments and debris are removed from sump, grate and collection area		X	X
Floating debris and floating oils are removed from trap			X
ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are crowned		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
STORMWATER BASINS AND TRAPS			
Embankments are free of settlement, slope erosion, internal piping, and downstream swamping		X	X
All flow control structure or orifices are operational and clear of debris or sediments		X	X
Any pre-treatment structure that collects sediment or hydrocarbons is clean or maintained		X	X
Vegetated filters and infiltration basins have adequate grass growth			X
Any impoundment or forebay is free of sediment		X	X
WINTER CONSTRUCTION (November 1st-April/15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

1. CONTRACTOR SHALL PROVIDE A QUALIFIED PERSON TO PERFORM INSPECTIONS. INSPECTIONS SHALL BE PERFORMED AT LEAST ONCE A WEEK, AND BEFORE AND AFTER A STORM EVENT. ANY DISTURBED AREA SHALL BE REGULARLY INSPECTED UNTIL THE SITE IS FULLY STABILIZED WITH EITHER 90% GRASS COVER OR A PERMANENT IMPERVIOUS SURFACE SUCH AS ASPHALT OR CONCRETE.
2. CONTRACTOR SHALL FURNISH AN INSPECTION REPORT AND KEEP A LOG OF ALL INSPECTIONS AND MAINTENANCE TASKS PERFORMED.
3. REPAIR OR MODIFY ANY FAILING MEASURE TO ADEQUATELY STABILIZE THE SITE PRIOR TO THE NEXT STORM EVENT OR NO LATER THAN 7 CALENDAR DAYS.
4. CONTRACTOR SHALL REPAIR, REPLACE, AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES SUCH THEY REMAIN EFFECTIVE UNTIL ALL AREAS ARE PERMANENTLY STABILIZED.
5. WHEN HEIGHT OF COLLECTED SEDIMENTS BEHIND SEDIMENT BARRIERS REACHES HALF THE HEIGHT OF THE SEDIMENT BARRIER, REMOVE AND LEGALLY DISPOSE OF THE SEDIMENT.
6. CONSTRUCTION ENTRANCE: REPLENISH SOIL AS NEEDED OR WHEN VOIDS BECOME FILLED WITH SEDIMENT. IF SEDIMENT IS BEING TRACKED ONTO ROADWAYS, PROVIDE DIVERSION RIDGE AND INCREASE LENGTH OF CONSTRUCTION ENTRANCE.

548-3-1	SITE PLAN
548-3-4	GRADING & DRAINAGE PLAN
548-3-5	EROSION CONTROL AND DETAILS

PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID						EROSION CONTROL and DETAILS 34.5 S.G./12KV S.G. S/S SHEET 3 OF 3	
							FOREST AVENUE S/S PORTLAND, ME	
							BY: BWM/BMC CK: RLR/BMC APP: RLR/BMC DATE: XXXX/XXXX SCALE: AS NOTED NO. FILE: 548-0003-005 SH 003.dwg 548-0003-005 SH 003	
							REV DESCRIPTION DATE BY CK APP	
							0-0B	

PRELIMINARY
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

EROSION CONTROL AND DETAILS

34.5 SC /12KV SC S/S

SHEET 3 OF 3

FOREST AVENUE S/S

PORTLAND, ME

NC

REV

0-0B

APPENDIX G – OPERATION AND MAINTENANCE PLAN

**Central Maine Power Company
Forest Avenue Substation Expansion
Stormwater System Operations and Maintenance Plan**

General Overview

Central Maine Power Company (CMP) has established an operations and maintenance (O&M) plan for the station post-construction stormwater management system in accordance with the Maine Stormwater Best Management Practices (BMP) Manual (May 2016) and will be implemented upon completion of construction as outlined below. Any required post-construction stormwater management permits will be obtained and implemented by Central Maine Power Company.

The project is located at an existing substation at 14 Marginal Way in the City of Portland, Cumberland County, Maine (Site). The Site lies on a 0.856-acre parcel owned by Central Maine Power Company (CMP), consisting of an existing substation, driveway, and grassed open space. The parcel is bordered on the west by Forest Avenue, Marginal Way to the south, an I-295 North on-ramp to the north, and a commercial development to the east. The proposed development will consist of a yard expansion to include a new control house and transformer with space allocated for a future transformer. The existing equipment within the yard will be removed except for the existing control house.

Purpose & Goals

The purpose of this O&M Plan is to provide guidance for the implementation and documentation process of the station site stormwater management system to help conform with corresponding regulatory agency approvals and permits. The guidance provided herein is the minimum required. The primary goal is to inform all the property managers about how the system operates and what maintenance items are necessary to protect the downstream waters. The secondary goal is to provide a practical, efficient means of maintenance planning and record keeping, to verify permit compliance.

Responsible Parties

CMP will be responsible for implementing this O&M plan.

Central Maine Power Company
83 Edison Drive
Augusta, ME 04330

Maintenance Logs & Checklists

CMP will keep a record of all maintenance procedures performed, date of inspection/cleanings, etc. Copies of inspection reports and maintenance records shall be kept on site. An inspection and maintenance schedule is also included on the Erosion Control and Details drawing (548-0003-005 SH 003).

Employee Training

Responsible operations and maintenance workers and contractors will be trained with a basic description of the purpose and function of the onsite stormwater management system as well as safety protocol and procedures, with annual updates, to provide that the workers tasked with maintaining the station site do so in accordance with the approved permit conditions. All workers that have maintenance duties will be adequately informed of their responsibilities. All sub-contractors (vacuum truck, landscaping, snowplowing, etc.) will be informed of special requirements and responsibilities.

Stormwater Management System

The stormwater management system has several components that are shown on the Grading & Drainage Plan (548-0003-004), and they perform various functions in treating and detaining stormwater runoff. Refer to the site plans and details for each of the following stormwater management system components:

Substation Yard Stone

The substation yard stone can become compacted and eroded over time. Inspect and repair any erosion within the yard twice annually. As stone areas become compacted, scrape off top layer to subgrade elevation and install new layer of crushed stone surfacing at design elevation and pitch.

Driveways and Parking Areas

Inspect driveways and parking areas annually in the spring and after major storm events. Clear and remove accumulated winter sand. Sweep pavement to remove sediment. Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder.

Vegetated Swales

Inspect vegetated swales twice annually in the spring and late fall and after major storm events. Repair newly formed channels or gullies. Reseed bare spots. Remove trash, leaves and/or accumulated sediments. Control woody or other undesirable vegetation. Monitor check dam integrity. Do not trim grass extremely short, as this will reduce the filtering effect of the swale. Maintain a minimum mow height of 6-inches. Remove cut vegetation to prevent the decaying organic litter from adding pollutants to the discharge from the swale.

Grassed Underdrained Soil Filter

Inspect grassed underdrained soil filter twice annually in the spring and late fall and after major storm events. Remove debris and sediment buildup from the basin at least once annually. Maintain healthy grass cover within the basin to minimize clogging of the filter with fine sediments. Repair any bare areas or erosion rills with new filter media, reseed and mulch. Inspect the embankments for settlement, soil erosion, piping and slumping. Mow the embankment to control woody vegetation.

Monitor drainage of filter after storm events of one inch or greater. The filter should drain within 24-48 hours. If the filter drains too fast, install an orifice on the underdrain outlet. If ponding exceeds 48 hours, rototill the top of the filter bed to reestablish the soil's filtration capacity. If ponding exceeds 72 hours, replace the top several inches of the filter with fresh material or rototill, reseed and mulch.

If mowing is desired, only hand-held string trimmers or push-mowers are allowed on the filter (no tractor) and the grass bed should be mowed no more than 2 times per growing season to maintain grass heights of no less than 6 inches. Fertilization of the underdrained filter area should be avoided unless absolutely necessary to establish vegetation. Harvesting and pruning of excessive growth should be done occasionally. Weeding to control unwanted or invasive plants may also be necessary.

Storm Drainage System

Inspect storm drainage system twice annually in the spring and late fall and after major storm events. Inspect and repair any damage to conveyance pipes, catch basins, and manholes. Remove any accumulated sediment or debris within or on catch basin grates and sumps, cleanouts, and manholes.

APPENDIX H – MAINE DEP BMP CALCULATIONS



	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	FENCE
	FINISHED GRADE MAJOR CONTOUR
	FINISHED GRADE MINOR CONTOUR
	GRADING DAYLIGHT
	LIMIT OF DISTURBANCE
	STORM DRAIN PIPE
	SANITARY SEWER PIPE
	DOMESTIC WATER SERVICE PIPE
	EXISTING SANITARY SEWER PIPE
	EXISTING WATER PIPE
	PROPOSED FINISHED GRADE SPOT ELEVATION
	MATCH EXISTING SPOT ELEVATION



**FOR PERMITTING
PURPOSES ONLY**

FIGURE H-1
FOREST AVE
WATER QUALITY AREAS
11/26/19

**Central Maine Power Company
Forest Avenue Substation Expansion**

Maine DEP Water Quality Standard BMP Sizing & Selection Calculations	Prepared By: K. Black Date: 10/9/2019 Last Revised: 10/15/2019
---	---

Grassed Underdrained Soil Filter Design Criteria:

Per Maine DEP Stormwater BMP Manual, the filter area shall exceed **5%** of contributing impervious area and **2%** of contributing landscaped area. The filter volume (below spillway) shall exceed **1-inch** over contributing impervious area and 0.4-inches over contributing landscaped areas. Volume is calculated without consideration for additional storage capacity within the filter media and crushed stone.

Contributing Impervious Area (SF) =	3,883	(See Figure H-1)
Contributing Landscaped* Area (SF) =	7,774	(See Figure H-1)
Minimum Filter Area (SF) =	350	(BMP Manual, above)
Proposed Filter Area (SF) =	1,110	
Minimum Filter Volume (CF) =	583	(BMP Manual, above)
Proposed Volume Stored Above Filter (CF) =	601	(Filter Area x 6.5 in. Depth Below Catch Basin Grate)

* Grassed areas outside of the substation yard and driveway are not anticipated to be mowed more than twice per year, and therefore, are not considered new developed areas. However, in sizing the soil filter, it was assumed contributing vegetated areas are "landscaped" and consequently "developed" per Maine DEP definitions, thereby maximizing the treatment capacity of the BMP.



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ELIAS BALDACCIO
GOVERNOR

DAVID
COK

June 5, 2008

Roy Koster
Central Maine Power
83 Edison Drive
Augusta, ME 04336

RE: DEP Stormwater Management Regulations and how they apply to
Central Maine Power Company Substations and Switchyards

Dear Mr. Koster:

I am writing to provide clarification on how substations and switchyards designed by Central Maine Power Company (CMP) can meet DEP Stormwater Management rules, Chapter 500 and the Site Location of Development Law. This letter supersedes a previous DEP letter on this subject dated February 29, 2008 and is a follow-up to further discussions between CMP and DEP staff.

Based on the report prepared by John Simon of Balance Engineering, dated March 8, 2008, regarding the stormwater runoff coefficient at CMP substations and switchyards, the required gravel fill and surface nature of these structures performs differently than most common construction practices and a modeling variance will be allowed for CMP substations and switchyards as follows:

When Flooding Standard requirements apply to a CMP project, modeling must demonstrate that peak runoff from the substation structure does not exceed predevelopment flow rates at the property line. Because of the permeability plus storage within the gravel fill and roughness of the crushed rock surface, the curve number (CN) specified in John Simon's report (March 2008) may be used for the substation area. As reported, a CN of 55 may be used for substations and switchyards that are built on areas that are mapped as HSG "A", "B", and "C", and a CN of 60 must be used when the area is mapped as HSG "D" for the HydroCAD model. However, all impervious surfaces will have to be added for an averaged curve number.

The General Standards of Chapter 500 (water quality) will be considered as met by the CMP substation/switchyard design specifications as long as the structure includes the typical CMP substation profile overlaying the natural ground surface. The soil layers within the CMP substation profile consist of 4 inches of crushed stone, 50:50 mix of 1.5"

USTA
STATE HOUSE STATION
USTA, MAINE 04333-0017
287-7688 FAX: (207) 287-7826
BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYW
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 76

e: www.maine.gov/dep

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and 0.75" diameter stone overlaying 18 inches or more of gravel fill, MDOT 703.06 Type A. Saturation within the granular fill will detain and provide treatment for the one-inch design standard under that requirement. Groundwater can never be any higher than 18 inches below the top of the gravel fill. Other treatment considerations will need to be provided for all impervious structures anticipated on the substation and switchyard and for the roadway.

The Basic Standards of Chapter 500 (erosion and sedimentation control, inspection and maintenance, and housekeeping) will be met by the standard CMP substation and switchyard design specification and erosion control/construction plan as developed by CMP for each Stormwater Management application. These are minimum erosion control measures that will need to be maintained until the site is fully stabilized. However, based on site and weather conditions during construction, additional erosion control measures may be needed.

While there are several ways to approach the design standards discussed above, these must be considered the minimum requirements in meeting the Stormwater Management and Site Location of Development Laws. However, in some situations where the local hydrology and site conditions warrant more resource protection, additional BMPs may be required. Also, the access drive and associated roadside swales are included in the disturbed area for permitting purposes and the treatment of these areas must be addressed separately from the substation or switchyard and be treated with standard practices. The natural hydrology of these areas will need to be maintained and will have to meet all applicable standards as established in Chapter 500 (page 11, Section 5).

I hope this addresses your request and will make the DEP permitting process more straight forward. If you have further questions, please contact Marianne Hubert at (207) 287-4140.

Sincerely,



Don Witherill, Director
Watershed Management Division
Bureau of Land and Water Quality

Cc: Marianne Hubert, PE, DEP program manager
Andy Fisk, DEP L&W Bureau Director
Dan Butler, PE, TRC
Gerry Mirabile, CMP

APPENDIX I – FLOODING STANDARD EXEMPTION

Black, Kenneth (Ken)

From: Justin Pellerin <jrp@portlandmaine.gov>
Sent: Wednesday, December 5, 2018 11:05 AM
To: Maurer, Brendan W
Subject: Re: Forest Avenue Substation
Attachments: image003.jpg; State Street 2018-12-05 Plan sent to Burns and Mac.pdf

Hi Brendan,

Here is a map that was part of the project design report. In the report the area break down was given in terms of larger overall watersheds. I went into the project SSA model and pulled areas that were broken down into smaller sub-catchments. It looks like the back half of the site drains to our new 84" SD via a couple of catch basins on Forest Avenue and the DOT right of way. A majority of the front half of the site drains to Marginal way into a combined sewer system. The city will be installing a new storm drain up Marginal way in 2019 that will separate out this flow from the substation site. The area's indicated probably incorporate more area than just the sub station property, as we didn't really care about individual properties during the design but the larger over all watershed.

Owen Chaplin of Gorrill Palmer was the design engineer for the project.
His number is 772-2515 if you have any more specific questions.

Thanks
Justin Pellerin, P.E.
Stormwater Project Engineer
City of Portland
Department of Public Works
55 Portland St, Portland Maine 04101
207-874-8828
JRP@Portlandmaine.gov

On Wed, Dec 5, 2018 at 10:05 AM Maurer, Brendan W <bwmaurer@burnsmcd.com> wrote:

Justin,

Looking to understand how the site fits into the overall watershed. I would be looking at time of concentrations and what kind of curve number or runoff coefficient the engineer selected for the CMP site, and if the system was designed with future development considered.

Enjoy the rest of your conference and I'll look forward to hearing from you next week.

Thanks,

Brendan Maurer, PE* \ Burns & McDonnell

Senior Civil Engineer \ Transmission & Distribution Services

o 203-294-2351

bwmaurer@burnsmcd.com \ www.burnsmcd.com

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From: Justin Pellerin <jrp@portlandmaine.gov>

Sent: Friday, October 12, 2018 12:14 PM

To: Maurer, Brendan W <bwmaurer@burnsmcd.com>

Cc: Bradley Roland <brad@portlandmaine.gov>; Nancy Gallinaro <neg@portlandmaine.gov>

Subject: Re: Forest Avenue Substation

Hey Brendan,

What in particular are you looking to understand about the system? It's a very large system that runs from the intersection of Cumberland/State down to Back Cove. The total drainage area is about 100 acres. The pipe is 84" most of the run except under Forest Avenue where it transfers to twin 60" pipes. I believe the substation property was factored into the drainage area delineation for the system. I am out of the office until Tuesday but I will get something for you next week.

Thanks

On Fri, Oct 12, 2018 at 10:04 AM Maurer, Brendan W <bwmaurer@burnsmcd.com> wrote:

Hi Justin,

Back in March you had helped me out providing some plans and information in the email below. I am now working on the drainage design for the substation expansion at [14 Marginal Way](#) and was hoping you could provide a copy of the drainage calculations used as the basis of design for the recently constructed drainage line that runs between the I-295 on-ramp and the substation property.

Thanks,

Brendan Maurer, PE* \ Burns & McDonnell

Senior Civil Engineer \ Transmission & Distribution Services

o 203-294-2351

bwmaurer@burnsmcd.com \ www.burnsmcd.com

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From: Justin Pellerin <jrp@portlandmaine.gov>
Sent: Friday, March 16, 2018 12:35 PM
To: Maurer, Brendan W <bwmaurer@burnsmcd.com>
Cc: Bradley Roland <brad@portlandmaine.gov>; Nancy Gallinaro <neg@portlandmaine.gov>
Subject: Re: Forest Avenue Substation

Hey Brendan.

Our sewer separation project brought storm drain from State Street crossing Forest Avenue near 295 exit 6 (twin 60" pipes) and then along the 295 DOT ROW towards Preble Street Extension (84"). We did not do any work on CMP property but worked just adjacent to the substation property. I have attached a pre-project survey of the area and the final construction drawing for the Forest Avenue storm drain crossing work. There is a sewer line within Forest Avenue and several DOT storm drain lines along the north easterly curb line but as far as I can tell there isn't a City sewer line that goes through the CMP substation property.

The Utility work for the sewer separation project is mainly complete as of last December. The contractor will be back around April 2 to start final restoration work in the area. They are scheduled to be complete around June 1st.

Let me know if you have any other questions.

Justin Pellerin, P.E.
Stormwater Project Engineer
City of Portland
Department of Public Works
[55 Portland St, Portland Maine 04101](#)

207-874-8828

JRP@Portlandmaine.gov

On Wed, Mar 14, 2018 at 6:19 PM, Maurer, Brendan W <bwmaurer@burnsmcd.com> wrote:

Hi Justin,

We are designing an expansion to the substation at the corner of Forest Ave and Marigold Way. Portland Water mentioned there was a recent construction project in that area, perhaps the State Street-Marginal Way Sewer Separation project. Can you let me know the status of the project and provide the design or as-built drawings.

Our topographic survey did not pick up a lot of record information on adjacent utilities, and some of our substation electrical drawings show an existing sewer line going through the site. I am trying to supplement the survey by obtaining available data that the City has available for sewer and storm drainage. I have attached a drawing with the area of interest clouded. Please give me a call or email to discuss or if you have any questions.

Thanks,

Brendan Maurer, PE* \ Burns & McDonnell

Senior Civil Engineer \ Transmission & Distribution Services

o [203-294-2351](tel:203-294-2351)

bwmaurer@burnsmcd.com \ www.burnsmcd.com

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--

Justin Pellerin, P.E.
Stormwater Project Engineer
City of Portland
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55 Portland St, Portland Maine 04101

207-874-8828

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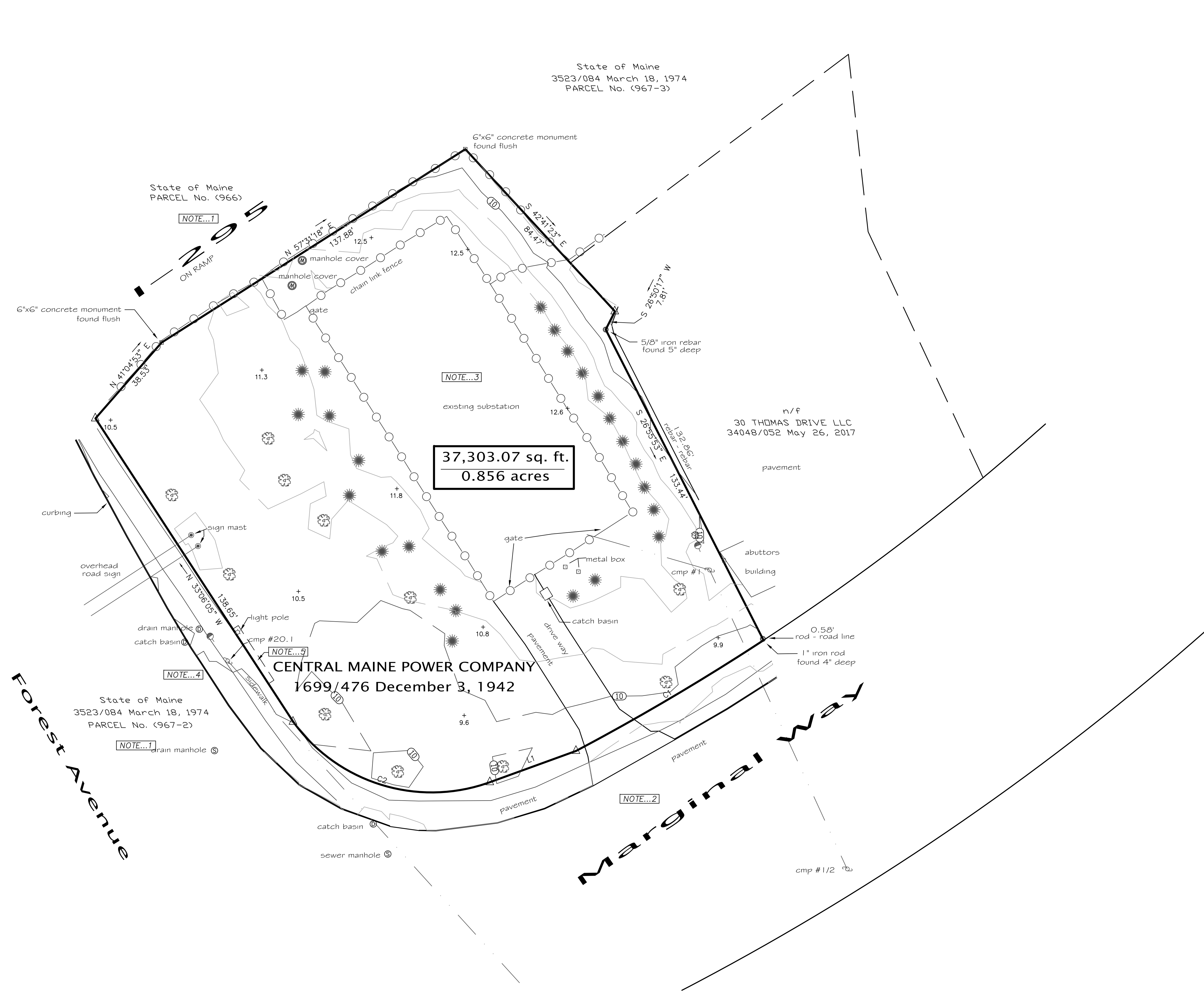
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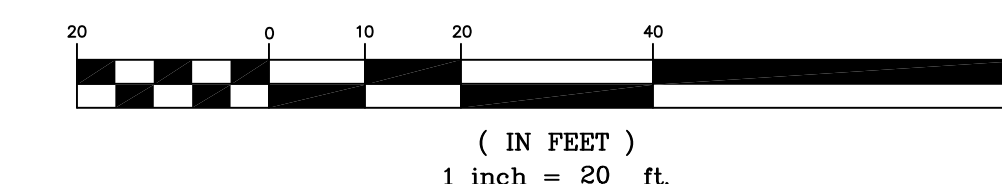
PREPARED FOR:

LOCATION: 14 MARGINAL WAY & FOREST AVENUE
PORTLAND, CUMBERLAND COUNTY, MAINE

DATE: NOVEMBER 11, 2017

REVISED 02-27-18 - REVISED LOCATION OF SUBSTATION FENCE - SE CORNER
ADDED OVERHEAD UTILITY NEAR SE CORNER OF SUBSTATION FENCE

GRAPHIC SCALE



LEGEND

- = 3/4" IRON REBAR SET WITH RED PLASTIC CAP INSCRIBED
S.W. GOULD PLS 2318 (unless otherwise noted).
- ⊕ = UTILITY POLE
- ∞ = STONEWALL
- x-x-x-x- = WIRE FENCE
- — — — — = overhead UTILITY LINE
- △ = ANGLE POINT - NOT MONUMENTED
- ⊙ = GUY ANCHOR
- ☼ = RED PINE TREE (VARIOUS DIAMETERS)
- 🌳 = HARDWOOD TREES (VARIOUS DIAMETERS AND TYPES)
- / — = INDEX CONTOUR (VERTICAL DATUM NAVD 1988 FEET)
- / — = INTERMEDIATE CONTOUR (VERTICAL DATUM NAVD 1988 FEET)

NOTES

- NOTE...1 FOREST AVENUE & I-295 - REFERENCE - MAINE STATE HIGHWAY
COMMISSION RIGHT OF WAY MAP SHC FILE NO. 3-185 SHEET 60 OF 73.
- NOTE...2 MARGINAL WAY - 100' IN WIDTH - REFERENCE PORTLAND CITY PLAN
NO. 599/11.
- NOTE...3 NO SURVEY DATA WAS COLLECTED WITHIN THE SUBSTATION FENCE.
- NOTE...4 REFERENCE 3523/084 FOR GRADING RIGHTS AND ACCESS RIGHTS ALONG
FOREST AVENUE
- NOTE...5 REFERENCE 3523/084 FOR SIGN EASEMENT

STATE OF MAINE
CUMBERLAND, ss , REGISTRY OF DEEDS

Received _____
at _____h _____m _____M, and recorded
in Plan File _____

ATTEST:

REGISTER

THIS SURVEY CONFORMS WITH THE RULES ADOPTED BY THE
MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND
SURVEYORS (April 1, 2001) WITH ANY EXCEPTION TAKEN TO
CHAPTER 90, PART 2, (Technical Standards) NOTED HEREON.
32 MRSA § 1390.3(2)

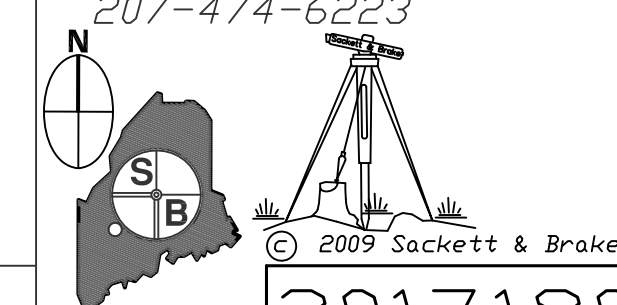
1. NO WRITTEN REPORT PREPARED AT THIS TIME.
2. NO NEW LEGAL DESCRIPTION PREPARED AT THIS TIME.

PREPARED BY: SACKETT & BRAKE SURVEY, INC.

INVALID - UNLESS SIGNED, SEALED AND/OR EMBOSSED BELOW.

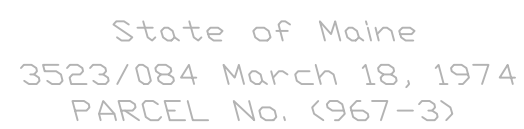
INVALID - UNLESS SIGNED, SEALED AND/OR EMBOSSED BELOW.

P.O. BOX 207, RTE 201 N
SKOWHEGAN, MAINE 04976
207-474-6223



STEPHEN W. GOULD
PLS 2318

2017180



State of Maine
PARCEL No. (966)

n/f
30 THOMAS DRIVE LLC
34048/052 May 26, 2017

State of Maine
3523/084 March 18, 1974
PARCEL No. (967-2)

UTILITY PLAN
SCALE: 1" = 20'

1. REFER TO SHEET 548-3-1 SHEET 1 OF 2 FOR GENERAL NOTES.
2. THE PURPOSE OF THIS PLAN IS TO DEPICT PROPOSED SEWER AND WATER SERVICES ONLY; ELECTRICAL SUBSTATION LAYOUT AND COMPONENTS SHOWN ARE FOR REFERENCE ONLY.
3. EXISTING UTILITY INFORMATION HAS BEEN COMPILED FROM UTILITY COMPANY AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIGSAFE" PRIOR TO COMMENCEMENT OF WORK AT "811" AND VERIFY ALL UTILITY LOCATIONS.
4. PROTECT EXISTING UTILITIES DURING CONSTRUCTION.
5. OBTAIN PERMITS FOR WORK IN PUBLIC RIGHT OF WAY FROM LOCAL MUNICIPALITY OR STATE DEPARTMENT OF TRANSPORTATION, AS APPLICABLE TO THE LOCATION OF THE WORK BEING PERFORMED. PAY PERMIT FEES AND POST ANY BONDS REQUIRED.
6. NEW WATER SERVICE SHALL BE IN ACCORDANCE WITH PORTLAND WATER DISTRICT STANDARD DETAILS AND SPECIFICATIONS. ENGAGE A SUBCONTRACTOR FROM PORTLAND WATER DISTRICT'S APPROVED TAPPING COMPANIES LIST TO MAKE CONNECTION TO EXISTING MAIN.
7. WORK WITHIN CITY RIGHT OF WAY SHALL BE IN ACCORDANCE WITH CITY OF PORTLAND STANDARD DETAILS AND SPECIFICATIONS, AND CITY OF PORTLAND RULES AND REGULATIONS FOR EXCAVATION ACTIVITY WITHIN THE PUBLIC RIGHT-OF-WAY. ENGAGE A SUBCONTRACTOR FROM CITY OF PORTLAND'S LICENSED EXCAVATOR LIST TO PERFORM EXCAVATION AND RESTORATION WORK WITHIN THE PUBLIC RIGHT OF WAY.
8. PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE MUTCD AND AS REQUIRED BY MUNICIPALITY OR STATE DEPARTMENT OF TRANSPORTATION PERMIT REQUIREMENTS. PROVIDE PLANS, OBTAIN PERMITS, PAY PERMIT FEES, PROVIDE CONES, SIGNAGE, FLAGGERS, POLICE PROTECTION AND OTHER MEASURES AS MAY BE REQUIRED.

	FENCE
	LIMITS OF DISTURBANCE
	STORM DRAIN PIPE, REFER TO DRAWING 548-3-4
	SANITARY SEWER PIPE
	DOMESTIC WATER SERVICE PIPE
	EXISTING SANITARY SEWER PIPE
	EXISTING WATER PIPE

- 1 CONNECT TO EXISTING WATER PIPE. REFER TO DETAILS ON DRAWING 548-3-2 SH 2
- 2 PROVIDE 1" DOMESTIC WATER SERVICE. REFER TO DETAILS ON DRAWING 548-3-2 SH 2
- 3 PROVIDE CURB STOP AND SERVICE BOX. REFER TO DETAILS ON DRAWING 548-3-2 SH 2
- 4 PROVIDE METER PIT. REFER TO DETAILS ON DRAWING 548-3-2 SH 2
- 5 CONNECT TO EXISTING COMBINED SEWER PIPE. VERIFY ELEVATION IN FIELD. REFER TO DRAWING 548-3-2 SH 3, DETAIL C3
- 6 PROVIDE 4" PVC SANITARY SEWER AT 1% MINIMUM SLOPE. REFER TO DRAWING 548-3-2 SH 3, DETAILS C3, C4
- 7 SAWCUT, REMOVE AND REPAIR BITUMINOUS SIDEWALK AS NEEDED TO INSTALL UTILITIES. 548-3-2 SH 3, DETAIL C1
- 8 REMOVE & RESET GRANITE CURB AS NEEDED TO INSTALL UTILITIES. REFER TO DRAWING 548-3-2 SH 3, DETAIL C5
- 9 SAWCUT, REMOVE, AND REPAIR ASPHALT PAVEMENT AS NEEDED TO INSTALL UTILITIES. REFER TO DRAWING 548-3-2 SH 1, DETAIL C5.

INFO

BURNS & MCDONNELL
27 PEARL ST., 2ND FLOOR
PORTLAND, ME 04101
207-517-8460

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548-2-1 GENERAL ARRANGEMENT PLAN
548-3-2 SITE DETAILS
548-3-4 GRADING & DRAINAGE PLAN
548-3-5 EROSION CONTROL AND DETAILS
548-6-2 FENCE AND GROUNDING DETAILS

PRELIMINARY
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

SITE PLAN
34.5 S.G./12KV S.G. S/S
SH 2 OF 2

FOREST AVENUE S/S	PORTLAND, ME
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BT	BVM/BMC	SCALE: 1 = 20	FILE: 548-0003-001 SH 002.0wg
CK	RLR/BMC	NO.	REV
APP	RLR/BMC	548-0003-001 SH 002	
DATE	XXXXXXXXXX	0-0B	

PE STAMP

AVANGRID ENGINEERING
CONFIDENTIAL, PROPRIETARY and
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						BY	BWM/BMC
						CK	RLR/BMC
						APP	RLR/BMC
REV	DESCRIPTION	DATE	BY	CK	APP	DATE	YYYYYY



FIELD NOTES:

1. PREEXISTING EQUIPMENT AND MANHOLE LOCATIONS ARE APPROXIMATE & SHOULD NOT BE USED FOR REFERENCE. FIELD TO VERIFY LOCATIONS.
2. FENCE IS PREEXISTING & SHARED WITH MDOT.
3. SEE DWGS. 548-41 & 548-43 FOR PLAN VIEW REMOVALS. BOTH DRAWINGS WILL BE VOIDED AT AS-BUILT.

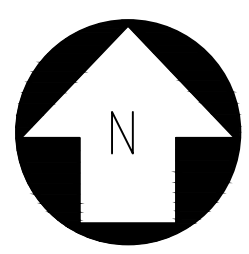
1. TRANSFORMER OIL CONTAINMENT (VOLUME IS XXXX GALLONS PER NAME PLATE) DESIGNED IN ACCORDANCE WITH TM2.71.17 SUBSTATION OIL CONTAINMENT.
2. TM2.71.54 SUBSTATION ELECTRICAL CLEARANCES (11-2012).
3. EQUIPMENT SHOWN AS ILLUSTRATIVE ONLY. TO BE UPDATED WHEN VENDOR INFORMATION IS AVAILABLE.

548-1-2	POWER ONE-LINE DIAGRAM 34.5KV S.G./12KV S.G. S/S
548-2-2 SH 1	GENERAL ARRANGEMENT SECTION A-A, B-B & C-C CONTROL HOUSE SECTIONS
548-2-2 SH 2	GENERAL ARRANGEMENT SECTION D-D, E-E, F-F & G-G
548-3-1 SH 1	SITE PLAN 34.5KV S.G./12KV S.G. S/S
548-3-1 SH 2	SITE PLAN 34.5KV S.G./12KV S.G. S/S
548-6-1	FENCE & GROUNDING PLAN 34.5KV S.G./12KV S.G. S/S
548-6-4	CONDUIT PLAN & SCHEDULE 34.5KV S.G./12KV S.G. S/S
548-6-8	YARD LIGHTING AND SECURITY PLAN 34.5KV S.G./12KV S.G. S/S
548-10-1	PHASE CONNECTION DIAGRAM
548-12-2	YARD ERECTION MATERIAL LIST (ABOVE GROUND)

REV	DESCRIPTION	DATE	BY	CK	APP
0-0A	ISSUED FOR BID	06/01/2018	NJ	SM	WGK
0-0B	30% ABOVE GROUND IFR	12/14/2018	NJ	SM	ML
0-0C	60% ABOVE GROUND IFR	11/28/2019	GMK	RS	SM
0-0D	ISSUED FOR PERMITTING	12/16/2019	ASG	RS	SM

	BURNS & McDONNELL 27 PEARL ST., 2ND FLOOR PORTLAND, ME 04101 207-517-8460
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HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 4'

STORM DRAIN PIPE DATA				
NAME	SIZE	MATERIAL	LENGTH	SLOPE
P-01	12"	PVC	19.2'	1.00%
P-02	12"	PVC	66.1'	0.83%
P-03	6"	PVC	5.8'	1.00%
P-04	12"	PVC	58.3'	1.00%
P-05	12"	PVC	5.6'	1.00%
P-06	12"	PVC	14.6'	1.00%
P-07	12"	PVC	12.5'	1.00%

FLOOD DESIGN NOTES:

LATEST FEMA MAP IS PRELIMINARY DATED 4/14/2017, MAP NUMBER 23005C0692F.

ZONE X (UNSHADED):	AREA OF MINIMAL FLOOD HAZARD
ZONE X (SHADED):	0.2% ANNUAL CHANCE FLOOD HAZARD, AREAS OF 0.2% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTH OF ONE FOOT OR WITH DRAINAGE AREAS OF ONE SQUARE MILE

TM 2.71.09 SECTION 2.3 REQUIRES DESIGN FOR 500 YEAR FLOOD EVENT PER
FEMA 543/ASCE 24. SUBSTATION SITE IS OUTSIDE 500 YEAR FLOOD ELEVATION.

REFERENCE DRAWINGS:

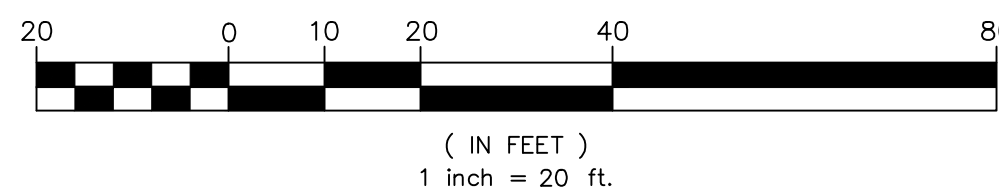
548-2-1 GENERAL ARRANGEMENT PLAN
548-3-1 SITE PLAN
548-3-2 SITE DETAILS
548-3-5 EROSION CONTROL AND DETAILS
548-3-6 FOUNDATION PLAN

PRELIMINARY

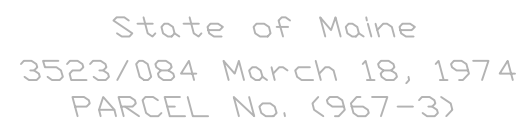
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

- GRADING & DRAINAGE NOTES:

1. REFER TO SHEET 548-3-1 FOR GENERAL NOTES.
2. THE PURPOSE OF THIS PLAN IS TO DEPICT PROPOSED GRADING & DRAINAGE IMPROVEMENTS ONLY; ELECTRICAL SUBSTATION LAYOUT AND COMPONENTS SHOWN ARE FOR REFERENCE ONLY.
3. MAINTAIN POSITIVE DRAINAGE ON THE SITE THROUGHOUT THE PROJECT DURATION.
4. ELEVATIONS AND CONTOURS INDICATED WITHIN THE YARD GRADED AREA ARE FINISHED GRADE.
5. CONTOURS OUTSIDE THE YARD GRADED AREA INDICATE THE TOP OF FINISHED TOPSOIL.
6. FINISHED GRADE IN THE YARD GRADED AREA IS THE TOP OF THE 6" THICK STONE TOPPING. SEE DRAWING 548-3-2 SH 1 NOTES FOR GRADATION.
7. EXCESS MATERIAL SHALL BE HAULED OFF AND DISPOSED OF OFF SITE IN ACCORDANCE WITH OWNER REQUIREMENTS AND THE OWNER-APPROVED WASTE/SPOILS MANAGEMENT PLAN, LATEST REVISION.
8. PROTECT EXISTING UTILITIES DURING CONSTRUCTION.
9. OBTAIN PERMITS FOR WORK IN PUBLIC RIGHT OF WAY FROM LOCAL MUNICIPALITY OR STATE DEPARTMENT OF TRANSPORTATION, AS APPLICABLE TO THE LOCATION OF THE WORK BEING PERFORMED. PAY PERMIT FEES AND POST ANY BONDS REQUIRED.
10. WORK WITHIN CITY RIGHT OF WAY SHALL BE IN ACCORDANCE WITH CITY OF PORTLAND STANDARD DETAILS AND SPECIFICATIONS, AND CITY OF PORTLAND RULES AND REGULATIONS FOR EXCAVATION ACTIVITY WITHIN THE PUBLIC RIGHT-OF-WAY. ENGAGE A SUBCONTRACTOR FROM CITY OF PORTLAND'S LICENSED EXCAVATOR LIST TO PERFORM EXCAVATION AND RESTORATION WORK WITHIN THE PUBLIC RIGHT OF WAY.
11. PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE MUTCD AND AS REQUIRED BY MUNICIPALITY OR STATE DEPARTMENT OF TRANSPORTATION PERMIT REQUIREMENTS. PROVIDE PLANS, OBTAIN PERMITS, PAY PERMIT FEES. PROVIDE CONES, SIGNAGE, FLAGGERS, POLICE PROTECTION AND OTHER MEASURES AS MAY BE REQUIRED.



PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID						 CMP AVANGRID	GRADING & DRAINAGE PLAN 34.5 S.G./12KV S.G. S/S				
								FOREST AVENUE S/S				
								PORTLAND, ME				
								BY	BWMBMC	SCALE: 1" = 20'	FILE: 548-0003-004.dwg	REV
								CK	RLBMBM	NO.		
								APP	RLBMBM			
								DATE	XXXXXX/XX/XX			
	REV	DESCRIPTION	DATE	BY	CK	APP		548-0003-004				
								0-0B				



State of Maine
PARCEL No. (966)

n/f
30 THOMAS DRIVE LLC
34048/052 May 26, 2017

State of Maine
3523/084 March 18, 1974
PARCEL No. (967-2)

- 1 PROVIDE STABILIZED CONSTRUCTION ENTRANCE, REFER TO DRAWING 548-3-5 SH 2, DETAIL EC5
- 2 PROVIDE SILT FENCE, REFER TO DRAWING 548-3-5 SH 2, DETAIL EC3
- 3 PROVIDE INLET PROTECTION, REFER TO DRAWING 548-3-5 SH 2, DETAIL EC4

Legend:

- 445 — EXISTING MAJOR CONTOUR
- — EXISTING MINOR CONTOUR
- FENCE
- 10 — FINISHED GRADE MAJOR CONTOUR
- 12 — FINISHED GRADE MINOR CONTOUR
- LOD — LIMITS OF DISTURBANCE
- GRADING DAYLIGHT
- ▼ SILT FENCE OR EQUIVALENT
- [Pattern of circles] CONSTRUCTION ENTRANCE
- [Curved arrows] CATCH BASIN INLET PROTECTION

1. ESTABLISH CONSTRUCTION WORKSPACE LIMITS; IDENTIFY AND MARK SENSITIVE RESOURCES.
2. PERFORM ALL WORK IN ACCORDANCE WITH MAINE EROSION CONTROL AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS (2016 REVISION), LOCAL MUNICIPALITY REQUIREMENTS, AND CENTRAL MAINE POWER ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES ON TRANSMISSION LINE AND SUBSTATION PROJECTS.
3. PRIOR TO USAGE, CONSTRUCT AND STABILIZE A CONSTRUCTION ENTRANCE WITH A STONE PAD, MUD RACK, OR OTHER MATERIALS USED TO REDUCE THE TRACKING OR FLOWING OF SEDIMENT OFF THE SITE AND MAINTAIN UNTIL CONSTRUCTION IS COMPLETED.
4. CLEAR TIMBER AND BRUSH; DO NOT GRUB UNTIL JUST PRIOR TO PRELIMINARY GRADING.
5. INSTALL AND MAINTAIN SEDIMENT BARRIERS SUCH AS SILT FENCING AND/OR OTHER EROSION CONTROL BARRIERS ALONG THE DOWNHILL LIMIT OF WORK, AS SHOWN ON THE DRAWINGS. SEDIMENT BARRIER LOCATIONS MAY BE ADJUSTED IN THE FIELD BASED ON SITE CONDITIONS AS DETERMINED BY THE ENGINEERING INSPECTOR. WHERE SILT FENCE CANNOT BE TOED-IN PROPERLY DUE TO TREE ROOTS, ROCKS OR FROZEN GROUND, HAY BALES OR AN EROSION CONTROL MIX BERM MAY BE SUBSTITUTED. SILT FENCING WILL BE INSTALLED AFTER CLEARING BUT PRIOR TO GRUBBING AND GRADING ACTIVITIES. ANY EROSION ISSUES DEVELOPED DURING CLEARING WILL BE TEMPORARILY STABILIZED AS NECESSARY.
6. INSTALL AND MAINTAIN CATCH BASIN INLET PROTECTION AT THE LOCATIONS INDICATED OR AS DIRECTED BY THE ENGINEERING INSPECTOR.
7. STABILIZE TEMPORARY PARKING AREAS AND EQUIPMENT STORAGE AND LAYDOWN AREAS WITH MATTING, CRUSHED STONE OR GRAVEL SUBBASE AS NECESSARY TO MINIMIZE RUTTING AND AVOID PONDING.
8. CONCURRENT WITH INITIATION OF SITE GRADING, CONSTRUCT AND STABILIZE TEMPORARY DRAINAGE SWALES, DIVERSION BERMS, CHECK DAMS, CULVERTS AND TEMPORARY SEDIMENTATION BERMS WITH TEMPORARY INLET AND OUTLET STRUCTURES AS NECESSARY TO MINIMIZE SEDIMENT IN SITE RUNOFF DURING THE CONSTRUCTION. DEWATER IN ACCORDANCE WITH DEWATERING NOTES.
9. MINIMIZE THE AMOUNT OF DISTURBANCE AT ANY ONE TIME BY STAGING CONSTRUCTION AS MUCH AS PRACTICAL FOR EFFICIENT CONSTRUCTION OF THE FACILITY. NATURAL VEGETATIVE BUFFERS OR STRIPS SHOULD BE LEFT IN PLACE WHERE FEASIBLE TO AID IN SEDIMENT RETENTION AND REDUCE EROSION POTENTIAL.
10. REDUCE THE STABILIZED CONSTRUCTION ENTRANCE SIZE AS NEEDED AS GRADING AND EQUIPMENT INSTALLATION PROGRESSES IN THE AREA WITHIN THE GRADING DAYLIGHT LINE AS SHOWN ON THE PLAN. MAINTAIN THE GREATEST SIZED CONSTRUCTION ENTRANCE FOOTPRINT FOR THE LONGEST DURATION POSSIBLE.
11. STABILIZE ANY NEWLY GRADED SLOPE GREATER THAN EIGHT PERCENT USING ANCHORED EROSION CONTROL BLANKETS OR OTHER APPROVED MULCHING TECHNIQUES WITHIN 24 HOURS. STABILIZE ANY SLOPE EXCEEDING EIGHT PERCENT AND BROUGHT TO FINAL GRADE WITHIN 24 HOURS USING THE APPROVED PERMANENT STABILIZATION MEASURES FOR SLOPES.
12. EROSION CONTROL BLANKETS, NETTING OVER LOOSE MULCH OR EROSION CONTROL MIX AS SPECIFIED IN THE MAINE ESC MANUAL MAY BE APPLIED TO ALL VEGETATED SLOPES EQUAL TO OR GREATER THAN 3:1. ALTERNATIVE MEASURES MAY ONLY BE USED WITH MDEP APPROVAL.
13. DUST CONTROL METHODS WILL BE EMPLOYED AFTER GRADING AND PRIOR TO FINAL STABILIZATION TO PREVENT THE BLOWING AND MOVEMENT OF DUST THROUGH THE APPLICATION OF WATER AND/OR CALCIUM CHLORIDE TO REDUCE WIND EROSION. REPETITIVE TREATMENT SHALL BE APPLIED AS NEEDED TO ACCOMPLISH CONTROL.
14. APPLY TEMPORARY SEED AND MULCH TO ANY EXPOSED AREAS WHERE ACTIVITY IS NOT ANTICIPATED FOR 30 DAYS OR MORE, OR WHERE ACTIVITY HAS NOT OCCURRED WITHIN 30 DAYS. TEMPORARILY MULCH ANY EXPOSED AREAS OR UNSTABILIZED AREAS WITHIN 100 FEET OF STREAMS, WETLANDS, AND OTHER WATER RESOURCES WHERE ACTIVITY IS NOT ANTICIPATED OR HAS NOT OCCURRED IN 7 DAYS, AND PRIOR TO ANY STORM EVENT.
15. REMOVE EXCESS SPOILS FROM SITE THAT WILL NOT BE USED FOR THE FINAL DESIGN AND STABILIZATION. STOCKPILED SOILS THAT REMAIN IN PLACE FOR 48 HOURS OR MORE WILL BE CONTAINED WITH SEDIMENT BARRIERS SUCH AS SILT FENCE, HAY BALES OR EQUIVALENT. THE SEDIMENT BARRIERS SHALL BE ADEQUATELY LOCATED AND REINFORCED TO HANDLE A SIGNIFICANT RAIN EVENT AND THE POTENTIAL SLUMPING OF THE PILE. BETWEEN APRIL 15 AND OCTOBER 1, APPLY TEMPORARY SEED AND MULCH TO A STOCKPILE THAT IS NOT EXPECTED TO BE DISTURBED WITHIN 30 DAYS. APPLY ANCHORED MULCH DIALY, AS NEEDED, DURING WINTER CONSTRUCTION.
16. INSPECT AND REPAIR EROSION CONTROL MEASURES DAILY IN AREAS OF ACTIVE CONSTRUCTION; OTHERWISE WEEKLY AND AFTER RAINFALL OF 1/2 INCH OR GREATER WITHIN A 24-HOUR PERIOD. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES 1/3 THE HEIGHT OF THE BARRIER.
17. MONITOR PUBLIC ROADS FOR SIGNS OF TRACKING OR SPILLING OF SPOIL MATERIAL AND CLEANUP AS NEEDED.
18. COMPLETE FINAL GRADING AND STABILIZATION OF SWALES OR BUFFER STRIPS THAT WILL CONTROL RUNOFF.
19. FINISH GRADE AND REPLACE TOPSOIL OR LOAM IN DISTURBED AREAS. SEED AND MULCH DISTURBED AREAS WITHIN 6 DAYS OF FINAL GRADING.
20. MAINTAIN ALL TEMPORARY EROSION CONTROLS AND SEDIMENT BARRIERS UNTIL VEGETATION HAS BEEN ESTABLISHED OVER 85-90% OF THE AREA TO BE REVEGETATED. RESEED SPARSELY VEGETATED AREAS.
21. REMOVE ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ONCE THE SITE IS PERMANENTLY STABILIZED.
22. CLEAN DEBRIS AND REMOVE SEDIMENT FROM STORM DRAIN PIPES AND DRAINAGE STRUCTURES.

ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

548-2-1	GENERAL ARRANGEMENT PLAN
548-3-1	SITE PLAN
548-3-2	SITE DETAILS
548-3-4	GRADING & DRAINAGE PLAN
548-3-5	EROSION CONTROL AND DETAILS
548-3-6	FOUNDATION PLAN

548-2-1
548-3-1
548-3-2
548-3-4
548-3-5
548-3-6

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AVANGRID ENGINEERING
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Property of AVANGRID



EROSION CONTROL AND DETAILS

SHEET 1 OF 3

FOREST AVENUE S/S PORTLAND, ME

BY	BWM/BMC	SCALE: 1" = 20'	FILE: 548-0003-005 SH 001.dwg
CK	RLR/BMC	NO.	REV
APP	RLR/BMC	548-0003-005 SH 001	0-0B
DATE	YY/YY/XXXX		

						BY	BWM/BMC	SCALE: 1" = 20'	FILE: 548-0003-005 SH 001.dwg	
						CK	RLR/BMC	NO.		
						APP	RLR/BMC		548-0003-005 SH 001	REV
REV	DESCRIPTION	DATE	BY	CK	APP	DATE	XXXX/XX/XXXX			0-0B

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SUMMARY OF TEMPORARY AND PERMANENT MULCH APPLICATION REQUIREMENTS			
CONDITION	TIMING	MULCH TYPE ^{1,2}	APPLICATION RATES
TEMPORARY			
	IF NO ACTIVITY IN EXPOSED AREAS FOR 7 DAYS, OR PRIOR TO A STORM EVENT	STRAW MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 2000 LB./ACRES
ALL DISTRIBUTED AREAS OF THE CONSTRUCTION WORKSPACE	APPLY MULCH TO ALL EXPOSED AREAS IF NO ACTIVITY OCCURS WITHIN 30 DAYS. APPLY MULCH AND TEMPORARY SEEDING SOONER WHEN IT CAN BE ANTICIPATED THAT ACTIVITY IS NOT GOING TO OCCUR WITHIN 30 DAYS.	STRAW MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 2000 LB./ACRES
ALL WORK AREAS EXPOSED ARE TO BE MULCHED DAILY EACH TIME SOIL IS DISTURBED	NOVEMBER 1 - APRIL 15	STRAW MULCH OR WOOD FIBER MULCH	3 TONS/ACRES 2000 LB./ACRES
PERMANENT			
ON ALL EXPOSED AREAS AFTER SEEDING TO STABILIZE THE SOIL SURFACE	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY HAY OR STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 1500 LB./ACRES 2000 LB./ACRES
WOOD CHIP APPLICATION AREAS	PERMANENT GRASS AND/OR LEGUME SEEDING COVERED BY HAY OR STRAW MULCH ON ALL AREAS THAT HAVE BEEN RESTORED TO FINAL GRADE. THIS DOES NOT APPLY TO AREAS STABILIZED BY OTHER MEANS SUCH AS JUTE MATTING OR PERMANENT EROSION CONTROL MIX.	CRIMPED STRAW MULCH OR PAPER MULCH OR WOOD FIBER MULCH	1.5 - 2 TONS/ACRES 1500 LB./ACRES 2000 LB./ACRES
NOTES: 1. STRAW AND HAY MULCH MAY BE USED INTERCHANGEABLY. EXCEPT IN WETLAND AREAS WHERE STRAW MULCH WILL BE REQUIRED. 2. DOUBLE RATE OF WOOD FIBER MULCH WHEN USED IN CRITICAL AREAS. 3. STRAW, HAY, OR HYDROMULCH (WOOD FIBER OR PAPER MULCH AS APPROPRIATE) WILL PROVIDE 90 PERCENT GROUND COVERAGE 4. PAPER MULCH IS ACCEPTABLE FOR USE DURING THE GROWING SEASON, ON SLOPES >30 PERCENT AND IN AREAS WHERE VEGETATION HAS NOT ESTABLISHED WELL. ADDITIONAL HAY MULCH WILL BE ADDED AS A WINTERIZING MEASURE.			

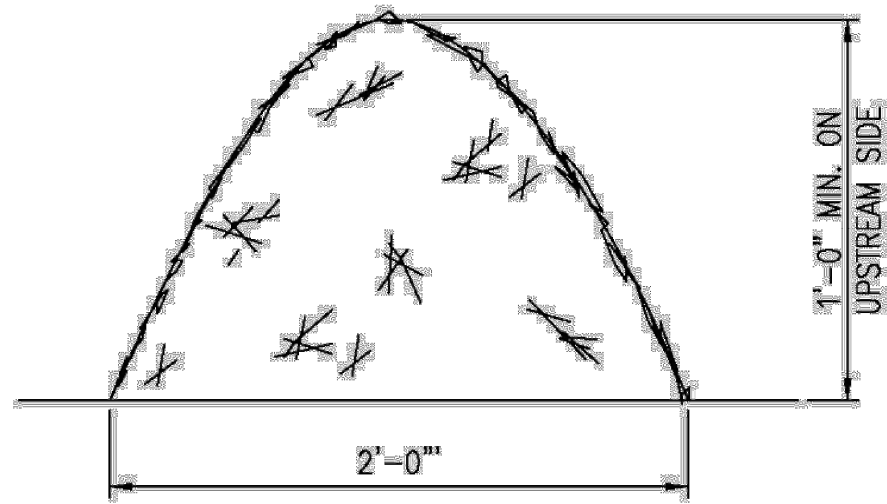
ON SLOPES GREATER THAN 3 PERCENT, HAY OR STRAW MULCH WILL BE FIRMLY ANCHORED INTO THE SOIL UTILIZING ONE OF THE FOLLOWING METHODS:

- CRIMPING WITH A STRAIGHT OR NOTCHED MULCH CRIMPING TOOL (FARM DISCS WILL NOT BE ALLOWED);
- TRACK WALKING WITH DEEP-CLEATED EQUIPMENT OPERATING UP AND DOWN THE SLOPE (MULCH CRIMPED PERPENDICULAR TO THE SLOPE) ON SLOPES <25 PERCENT;
- APPLICATION OF MULCH NETTING;
- APPLICATION OF 500 LB./ACRE OF WOOD FIBER MULCH OVER STRAW/MULCH; AND
- COMMERCIALLY AVAILABLE TACKIFIERS (EXCEPT WITHIN 100 FEET OF WATERBODIES OR WETLANDS).

SEED MIX SPECIFICATIONS		
SEED MIX NAME	SEED MIX COMPONENTS	LB./ACRE
TEMPORARY SEED MIX	ANNUAL RYEGRASS	40
PERMANENT UPLAND SEED MIX	REDTOP	4
	CREEPING RED FESCUE	40
	TALL FESCUE	40
	BIRDSFOOT TREFOIL	16
WOODCHIP APPLICATION SEED MIX	CREEPING RED FESCUE	20
	REDTOP	4
	TALL FESCUE	30
	CROWNVECH	30
WETLAND SEED MIX	ANNUAL RYEGRASS	40
SUPPLEMENTAL WINTER SEED MIX ¹	WINTER RYEGRASS	120

NOTES:

1. INCREASE SEEDING RATES 10% WHEN HYDROSEEDING
2. WINTER RYE WILL BE ADDED TO PERMANENT UPLAND MIX AT A RATE OF 120 LB./ACRE BETWEEN OCTOBER 1 AND APRIL 15

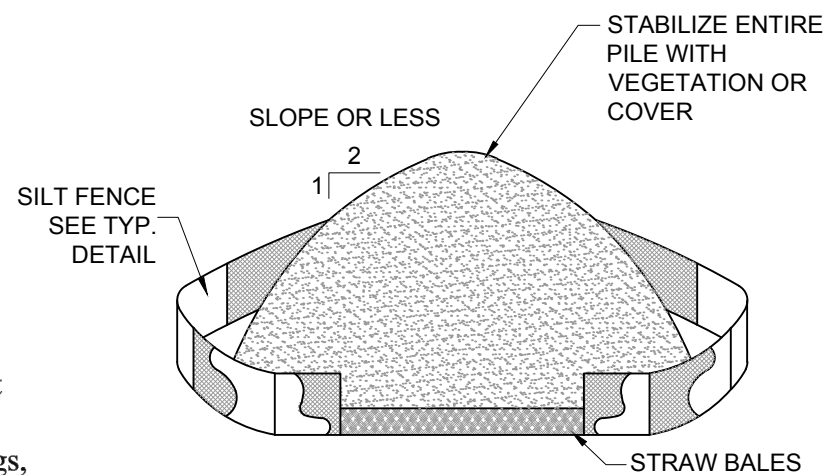


- Use erosion control mix berm in place of silt fence and/or hay bale sediment barriers
- Erosion control soil/bark mix shall consist of: shredded bark, stump grindings, composted bark or flume grit and fragmented wood generated from water-flume log handling systems. The mix shall conform to the following:

1. pH: 5.0 to 8.0
2. Screen Size: 6" – 100% passing
¾" – 70% to 85% passing
Mix shall not contain large portions of silts, clays or fine sands
3. Organic material: 20% - 100% (dry weight basis)
Organic portion must be fibrous and elongated
4. Soluble salts shall be <4.0 mmhos/cm

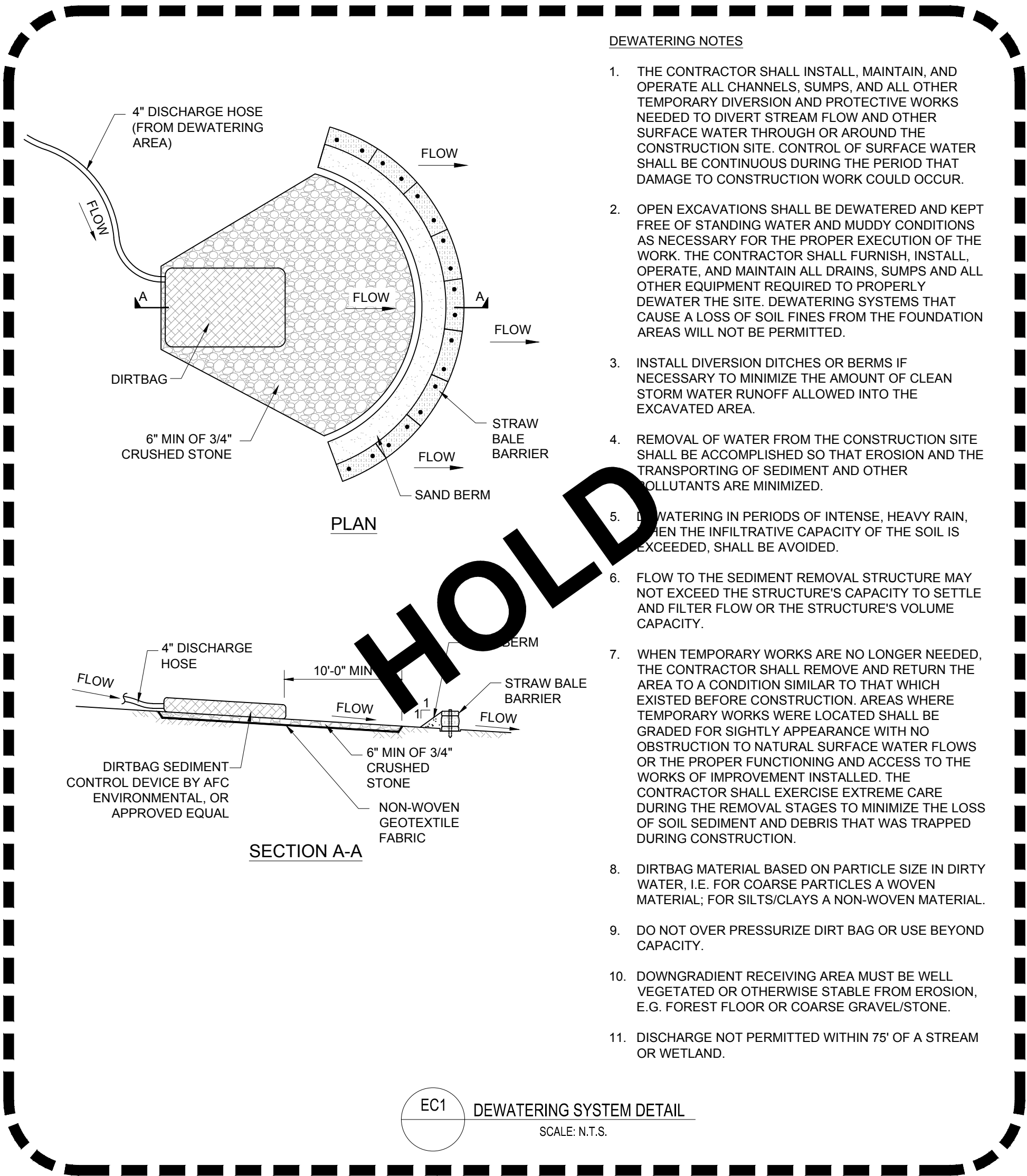
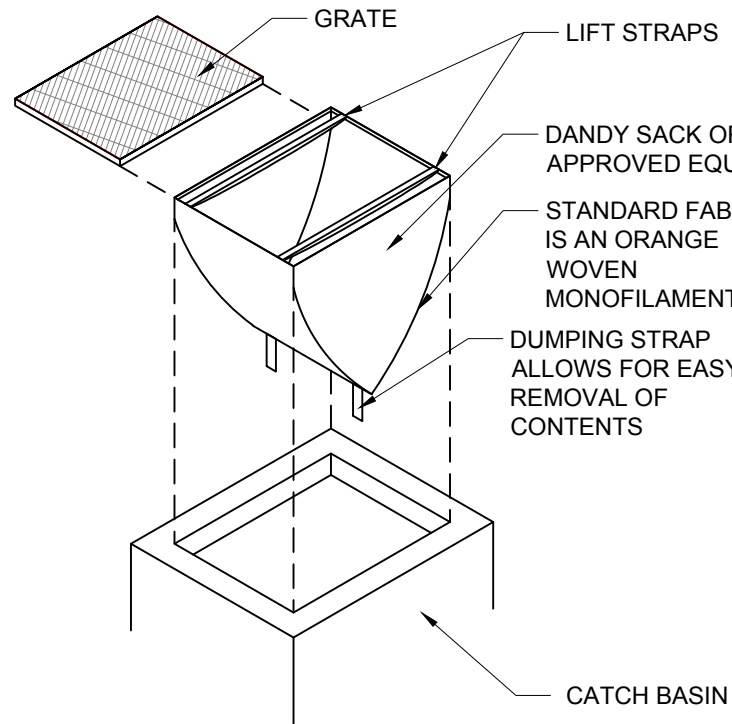
NOTES:

1. DETAIL IS FROM CMP ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES ON TRANSMISSION LINE AND SUBSTATION PROJECTS (EREF-CMP.003) REVISED 8/11/2016.



INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAW BALES, THEN STABILIZED WITH VEGETATION OR COVERED.



1. WOVEN WIRE FENCE TO BE FASTENED TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MIDSECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN BUILD-UP REACHES 1/3 THE HEIGHT OF THE FENCE.

POSTS:

FENCE:

FILTER CLOTH:

STEEL "T" OR "U"
TYPE OR 2" HARDWOOD.

WOVEN WIRE. 14
1/2 GA 6"MAX MESH OPENING.

FILTER X, MIRAFLI 100X,
STABLINKA T140N OR

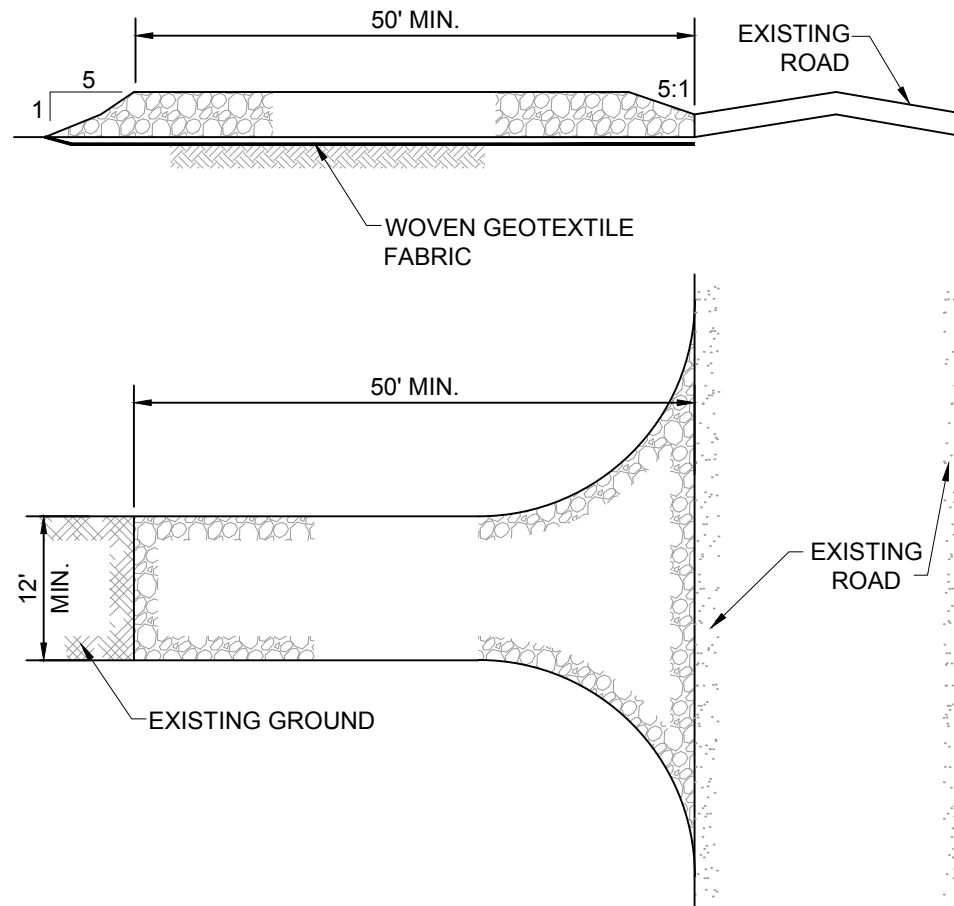
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SUMMARY OF SEEDING REQUIREMENTS		
CONDITION	TIMING ^{1,2}	SEED MIX
TEMPORARY SEEDING ³	TEMPORARY SEED BETWEEN APRIL 15 AND OCTOBER 1 ONLY. DISTURBED AREAS OR SPOIL STOCKPILES WILL BE SEEDED IMMEDIATELY IF FURTHER DISTURBANCE IS NOT EXPECTED FOR 30 DAYS OR MORE.	ANNUAL RYEGRASS
PERMANENT SEEDING ^{3,4}		
UPLAND PORTIONS OF THE CONSTRUCTION AREA SLOPES > 3:1	DISTURBED AREA WILL BE SEEDED WITHIN 6 DAYS OF FINAL GRADING. DISTURBED AREA WILL BE SEEDED IMMEDIATELY AFTER SEEDBED PREPARATION.	PERMANENT UPLAND MIX PERMANENT UPLAND MIX
WETLANDS	DISTURBED WETLANDS WILL BE SEEDED WITHIN 6 DAYS OF FINAL GRADING.	ANNUAL RYEGRASS
WOODCHIP APPLICATION AREAS	DISTURBED AREA WILL BE SEEDED WITHIN 6 DAYS OF FINAL GRADING.	WOODCHIP APPLICATION SEED MIX
WINTER DORMANT SEEDING	DORMANT SEED BETWEEN OCTOBER 1 AND APRIL 15 ONLY. NO SEEDING WILL OCCUR IF SNOW DEPTHS EXCEED 1 INCH.	PERMANENT UPLAND MIX PLUS WINTER RYEGRASS
NOTES: 1. WEATHER CONDITIONS PERMITTING. 2. AREAS THAT DO NOT SUCCESSFULLY REVEGETATE WITHIN APPROPRIATE PERIOD OF TIME SHALL BE RESEEDED AS NECESSARY. 3. LOOSEN COMPACTED SOIL TO A MINIMUM DEPTH OF 4 INCHES. 4. TOP DRESS WITH 6 INCHES LOAM, AS NEEDED.		

IN GENERAL, FERTILIZER AND LIME APPLICATION RATES WILL FOLLOW THE GUIDELINES IDENTIFIED BELOW UNLESS SITE SPECIFIC SOIL TESTS IDENTIFY THE NEED FOR ALTERNATIVE FERTILIZER/LIME APPLICATION RATES. FERTILIZER WILL BE APPLIED TO UPLAND AREAS PRIOR TO SEEDING AT A RATE OF 800 POUNDS PER ACRE USING 10-20-20 (N-P205-K20) OR EQUIVALENT. GROUND LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) WILL BE APPLIED AT A RATE OF 3 TONS PER ACRE. AN EQUIVALENT MIXTURE OF FERTILIZER AND LIME MAY BE APPLIED USING THE HYDROSEEDING METHOD. NO LIME OR FERTILIZER WILL BE APPLIED TO WETLANDS.



PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID						EROSION CONTROL AND DETAILS 34.5 S.G./12KV S.G. S/S SHEET 2 OF 3					
							FOREST AVENUE S/S PORTLAND, ME					
							BY	BWM/BMC	SCALE: AS NOTED	FILE: 548-0003-005 SH 002.dwg	REV	
							CK	RLR/BMC	NO.			
							APP	RLR/BMC				
							DATE	XX-XX-XXXX	548-0003-005 SH 002	0-0B		
							REV	DESCRIPTION	DATE	BY	CK	APP

1. STONE SIZE - USE 2" CRUSHED STONE
2. LENGTH - NOT LESS THAN 50 FEET.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MIN. BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. WOVEN GEOTEXTILE FABRIC - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

- IF A CONSTRUCTION SITE IS NOT STABILIZED WITH PAVEMENT, A GRAVEL ROAD BASE, 90% MATURE VEGETATION COVER, EROSION CONTROL MULCH OR RIPRAP BY NOVEMBER 1, THEN THE SITE NEEDS TO BE PROTECTED WITH OVERWINTER STABILIZATION. THE WINTER CONSTRUCTION PERIOD IS FROM NOVEMBER 1 THROUGH APRIL 15.
2. WHEN SCHEDULING WORK FOR PERMANENTLY STABILIZED AREAS, PLAN ON APPLYING PERMANENT SEEDING 45 DAYS PRIOR TO FIRST KILLING FROST. SCHEDULING OF WORK SHALL ANTICIPATE THAT VEGETATION WILL NOT GROW PAST OCTOBER 15.
3. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS BEING ACTIVELY WORKED ON AT ANY ONE TIME WITHOUT REGULAR INSPECTION. DURING THE EXPOSED AREA TO THOSE AREAS THAT CAN BE MULCHED IN ONE DAY, ALL AREA SHALL BE CONSIDERED DENUDEED UNTIL THE SUBBASE GRAVEL IS INSTALLED IN ROADWAY AREAS OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. A COVER OF EROSION CONTROL MIX PERFORMS THE BEST.
4. ANY ADDED MEASURES, WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION MUST BE PROVIDED AND TAILORED TO SITE CONDITIONS, THE ACTUAL SITE SIZE, SOIL ERODIBILITY, SLOPE, GROUNDWATER, AND WEATHER CONDITIONS.
5. TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION, CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED.
6. FOR CONSTRUCTION OCCURRING AFTER NOVEMBER 1, STABILIZE DISTURBED AREAS DAILY WHILE CONSTRUCTION IS ACTIVE. REPAIR EROSION OR UNCONTROLLED, UNINTENDED DISCHARGES IMMEDIATELY.
7. WHERE SEDIMENT BARRIERS ARE PROPOSED OR REQUIRED, AND ARE LOCATED WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE (WETLANDS, WATERCOURSES, ETC.), PROVIDE A DOUBLE ROW OF SEDIMENT BARRIERS.
8. DURING FROZEN CONDITIONS, SEDIMENT BARRIERS MAY CONSIST OF EROSION CONTROL MIX BERMES OR ANY OTHER RECOGNIZED SEDIMENT BARRIERS AS FROZEN SOIL PREVENTS THE PROPER INSTALLATION OF HAY BALES OR SILT FENCES.
9. ALL AREA SHALL BE CONSIDERED TO BE DENUDEED UNTIL SEEDED AND MULCHED. HAY MULCH SHALL BE APPLIED AT A RATE OF 150 POUNDS PER 1,000 SQUARE FEET OR 3 TONS/ACRE (TWICE THE NORMAL ACCEPTED RATE OF 75-LBS./1,000 S.F. OR 1.5 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED.
10. MULCH SHALL NOT BE SPREAD ON TOP OF SNOW. REMOVE SNOW PRIOR TO MULCHING.
11. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED OR ADEQUATELY ANCHORED SO THAT GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.
12. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 30, ALL MULCH SHALL BE ANCHORED BY EITHER MULCH NETTING, ASPHALT EMULSION CHEMICAL, TRACKING OR EROSION CONTROL MIX. THE COVER WILL BE CONSIDERED SUFFICIENT WHEN THE GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.
13. AFTER NOVEMBER 1, AT THE END OF EACH CONSTRUCTION DAY, AREAS THAT HAVE REACHED FINAL GRADE MUST BE STABILIZED.
14. STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED FOR OVERWINTER PROTECTION WITH HAY AT TWICE THE NORMAL RATE OR WITH A FOUR-INCH LAYER OF EROSION CONTROL MIX. THIS SHALL BE DONE WITHIN 24 HOURS OF STOCKPILING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL OR SNOWFALL. ANY SOIL STOCKPILE SHALL NOT BE PLACED (EVEN COVERED WITH MULCHED) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.
15. BETWEEN THE DATES OF OCTOBER 1 AND APRIL 15, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES FINISHED AREAS SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER OCTOBER 15 AND IF THE EXPOSED AREA HAS BEEN LOAMED AND FINAL GRADED WITH A UNIFORM SURFACE, THEN AFTER THE FIRST KILLING FROST, THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN COVERED WITH OVERWINTER MULCH OR AN ANCHORED EROSION CONTROL BLANKET.
16. DORMANT SEEDING MAY BE PLACED PRIOR TO THE PLACEMENT OF MULCH OR EROSION CONTROL BLANKETS. IF DORMANT SEEDING IS USED FOR THE SITE, ALL DISTURBED AREAS SHALL RECEIVE 4" OF LOAM AND SEED AT AN APPLICATION RATE 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED. ALL AREAS SEEDED DURING THE WINTER SHALL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS INSUFFICIENTLY VEGETATED (LESS THAN 75% CATCH) SHALL BE REVEGETATED.
17. IF DORMANT SEEDING IS NOT USED FOR THE SITE, ALL DISTURBED AREAS SHALL BE REVEGETATED IN THE SPRING.

- a. SEED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND PROTECT WITH EROSION CONTROL BLANKETS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE SLOPE BY NOVEMBER 15, THE SLOPE SHALL BE PROTECTED WITH EROSION CONTROL BLANKET, EROSION CONTROL MIX, OR WITH STONE RIPRAP.
 - b. THE DISTURBED, VEGETATED SLOPE MAY BE STABILIZED WITH PROPERLY INSTALLED SOD. PROPER INSTALLATION INCLUDES PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. DO NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - c. EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 1. DO NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - d. PLACE A LAYER OF STONE RIPRAP ON THE SLOPES BY NOVEMBER 1.
19. BY NOVEMBER 1, ALL VEGETATED AREAS HAVING A SLOPE OF 15% OR LESS MUST BE STABILIZED WITH 90% GRASS COVER. IF THE DISTURBED AREAS ARE NOT STABILIZED BY THIS DATE, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SOIL FOR LATE FALL AND WINTER:
- a. SEED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, MULCH THE SEEDED SOIL WITH HAY AT 75 POUNDS PER 1,000 SQUARE FEET, AND ANCHOR THE MULCH WITH NETTING.
 - b. BY NOVEMBER 1, MULCH THE DISTURBED SOIL BY SPREADING HAY AT A RATE OF AT LEAST 150 POUNDS PER 1,000 SQUARE FEET, OR PROVIDE EROSION CONTROL BLANKET OR EROSION CONTROL MIX.
20. 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.
21. VEGETATED DITCHES, CHANNELS, SWALES, OR OTHER AREAS THAT CONCENTRATE AND CONVEY RUNOFF SHALL BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. IF THESE FACILITIES ARE NOT VEGETATED WITH AT LEAST 75% COVER BY NOVEMBER 1, OVEREXCAVATE AND PROVIDE RIPRAP LINING.
22. MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION.
23. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 85 TO 90% OF AREA VEGETATED WITH VIGOROUS GROWTH.
24. STABILIZATION SCHEDULE BEFORE WINTER
- a. SEPTEMBER 1
 - ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED.
 - ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED.
 - ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET.
 - b. OCTOBER 1
 - APPLY SEEDING FOR TEMPORARY VEGETATION TO PREPARE FOR WINTER CONDITIONS.
 - c. NOVEMBER 15
 - SLOPES TO BE COVERED WITH RIPRAP MUST HAVE RIPRAP INSTALLED.
 - DITCHES, CHANNELS, SWALES, ETC. WITHOUT 75% VEGETATIVE COVER SHALL BE LINED WITH RIPRAP.
 - ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVERWINTER.

548-3-1 SITE PLAN
548-3-4 GRADING & DRAINAGE PLAN
548-3-5 EROSION CONTROL AND DETAILS

CONTRACTOR SHALL PROVIDE INSPECTION IN ACCORDANCE WITH THE FOLLOWING:

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X
CATCH BASIN SYSTEMS			
Catch basins are built properly	X		
Accumulated sediments and debris are removed from sump, grate and collection area		X	X
Floating debris and floating oils are removed from trap			X
ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are crowned		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	
Any sediment accumulation is removed from within spreader or turnouts		X	X
STORMWATER BASINS AND TRAPS			
Embankments are free of settlement, slope erosion, internal piping, and downstream swamping		X	X
All flow control structure or orifices are operational and clear of debris or sediments		X	X
Any pre-treatment structure that collects sediment or hydrocarbons is clean or maintained		X	X
Vegetated filters and infiltration basins have adequate grass growth			X
Any impoundment or forebay is free of sediment		X	X
WINTER CONSTRUCTION (November 1st-April/15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

1. CONTRACTOR SHALL PROVIDE A QUALIFIED PERSON TO PERFORM INSPECTIONS. INSPECTIONS SHALL BE PERFORMED AT LEAST ONCE A WEEK, AND BEFORE AND AFTER A STORM EVENT. ANY DISTURBED AREA SHALL BE REGULARLY INSPECTED UNTIL THE SITE IS FULLY STABILIZED WITH EITHER 90% GRASS COVER OR A PERMANENT IMPERVIOUS SURFACE SUCH AS ASPHALT OR CONCRETE.
2. CONTRACTOR SHALL REPORT ALL INSPECTION REPORTS AND KEEP A LOG OF ALL INSPECTIONS AND MAINTENANCE TASKS PERFORMED.
3. REPAIR OR MODIFY ANY FAILING MEASURE TO ADEQUATELY STABILIZE THE SITE PRIOR TO THE NEXT STORM EVENT OR NO LATER THAN 7 CALENDAR DAYS.
4. CONTRACTOR SHALL REPAIR, REPLACE, AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES SUCH THEY REMAIN EFFECTIVE UNTIL ALL AREAS ARE PERMANENTLY STABILIZED.
5. WHEN HEIGHT OF COLLECTED SEDIMENTS BEHIND SEDIMENT BARRIERS REACHES HALF THE HEIGHT OF THE SEDIMENT BARRIER, REMOVE AND LEGALLY DISPOSE OF THE SEDIMENT.
6. CONSTRUCTION ENTRANCE: REPLENISH SOIL AS NEEDED OR WHEN VOIDS BECOME FILLED WITH SEDIMENT. IF SEDIMENT IS BEING TRACKED ONTO ROADWAYS, PROVIDE DIVERSION RIDGE AND INCREASE LENGTH OF CONSTRUCTION ENTRANCE.

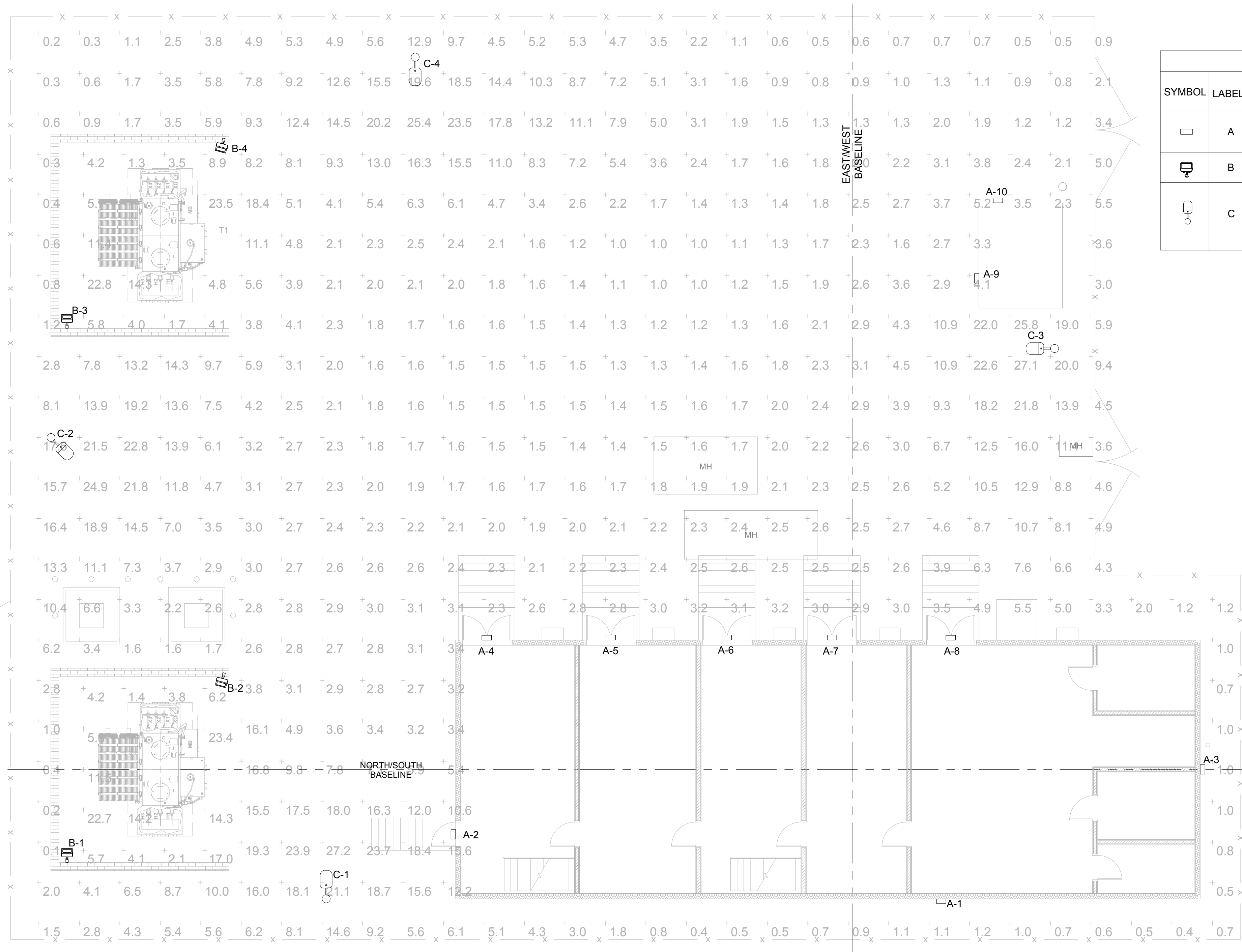
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PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID									EROSION CONTROL AND DETAILS 34.5 S.G./12KV S.G. S/S SHEET 3 OF 3								
										FOREST AVENUE S/S						PORTLAND, ME		
							BY	BW/BM/C	SCALE: AS NOTED	FILE: 548-0003-005 SH 003.dwg	REV							
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LOGO	INFO
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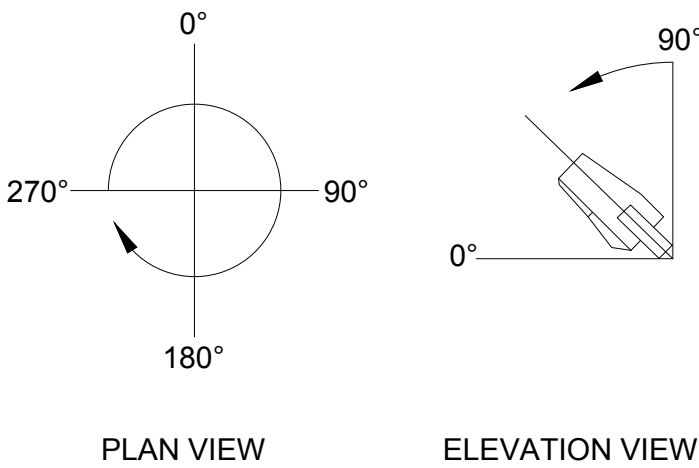
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SCHEDULE										
SYMBOL	LABEL	QTY	MANUFACTURE	CATALOG NUMBER	DESCRIPTION	LAMP	NUMBER LAMPS	LUMENS PER LAMP	LLF	WATTAGE
	A	10	HOLOPHANE	W4PLED-10C700-30K-T3M-120-SPD-PE-SF-GYSDP	W4PLED, 10 LED, 10C PERFORMANCE PACKAGE, 3000K CCT, TYPE 3 OPTICS	LED	1	2030	0.85	26
	B	4	HOLOPHANE	PSLED-PK1-MVOLT-FL-30K-1-GYSDP	PREDATOR PSLED FLOOD LIGHT, PK1, FL DISTRIBUTION, 3000K	LED	1	6000	0.85	49
	C	4	HOLOPHANE	MGLED-4-3K-AS-N-L-V-G-US	MONGOOSE LED WITH 4 COBS, 3000K COLOR TEMPERATURE, 1050MA DRIVE CURRENT, TYPE N LENS (NARROW), LOW TILT, UPLIGHT SKIRT	LED	1	21199	0.85	168

LUMINAIRE LOCATIONS			
LABEL	MH	ORIENTATION	TILT
A-1	14.80	180.00	0.00
A-2	13.80	270.00	0.00
A-3	14.80	90.00	0.00
A-4	16.80	0.00	0.00
A-5	16.80	0.00	0.00
A-6	16.80	0.00	0.00
A-7	16.80	0.00	0.00
A-8	16.80	0.00	0.00
A-9	8.00	270.00	0.00
A-10	8.00	0.00	0.00
B-1	10.00	0.00	55.00
B-2	10.00	195.00	55.00
B-3	10.00	0.00	55.00
B-4	10.00	195.00	55.00
C-1	16.00	0.00	0.00
C-2	16.00	120.00	0.00
C-3	16.00	270.00	0.00
C-4	16.00	180.00	0.00

STATISTICS			
DESCRIPTION	AVG	MAX	MIN
TRANSFORMER -1 AREA	8.3 FC	23.5 FC	1.3 FC
TRANSFORMER -1 MB	12.5 FC	12.5 FC	12.5 FC
TRANSFORMER -2 AREA	9.7 FC	23.4 FC	1.4 FC
TRANSFORMER -2 MB	14.2 FC	14.2 FC	14.2 FC
YARD AND FENCE AREA	5.2 FC	27.2 FC	0.1 FC



LIGHTING ORIENTATION

NOTE:

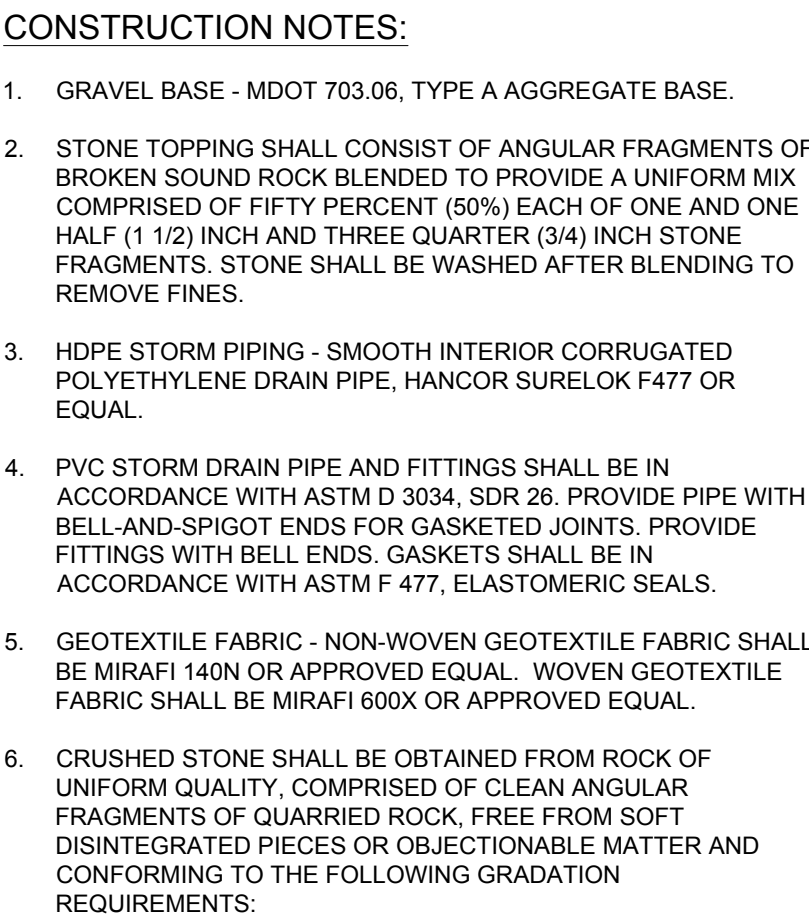
1. REFER TO 548-6-9 SH 3 FOR YARD LIGHTING CIRCUIT DETAILS.

REFERENCE DRAWINGS:

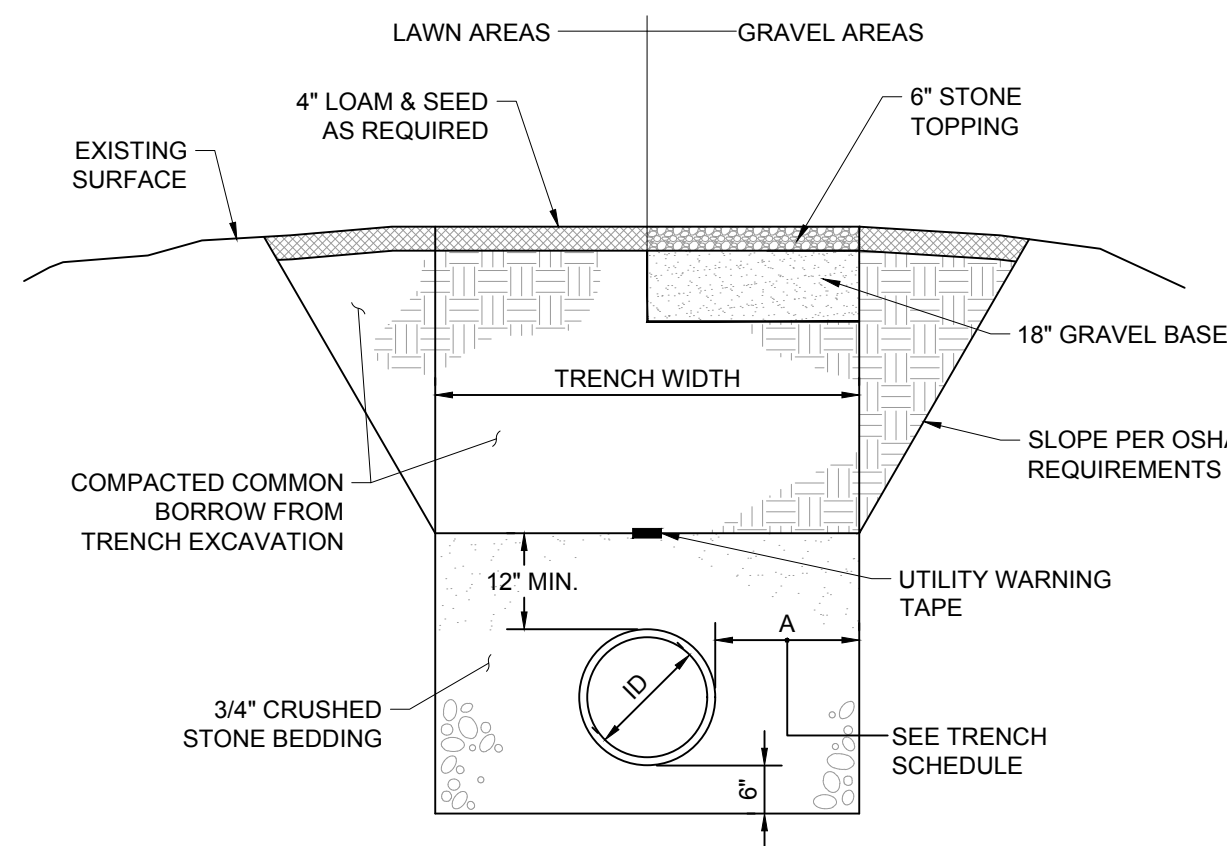
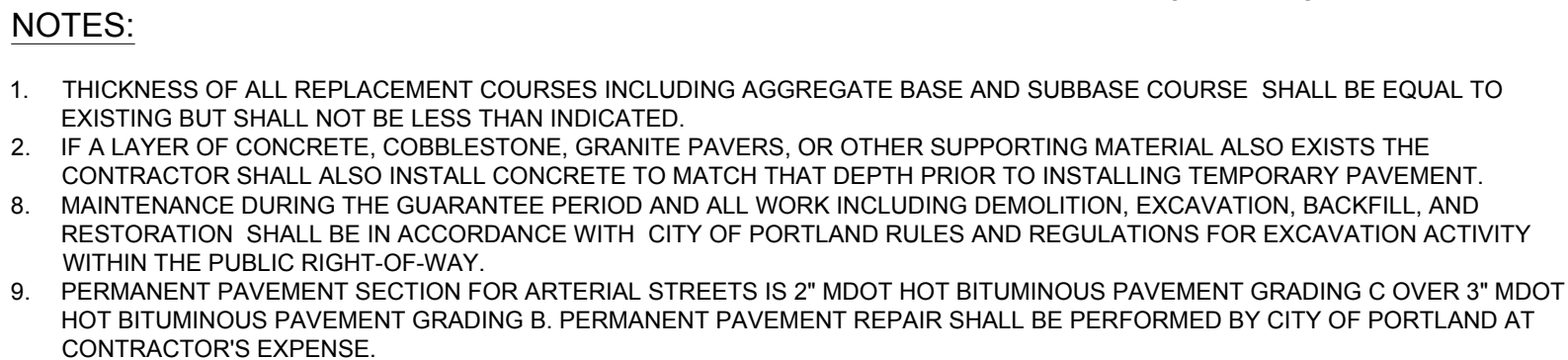
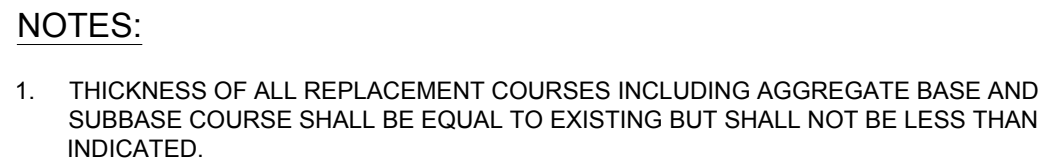
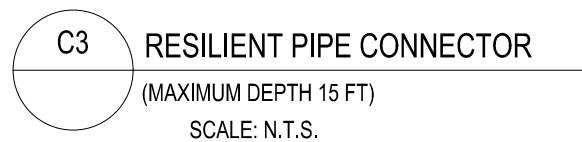
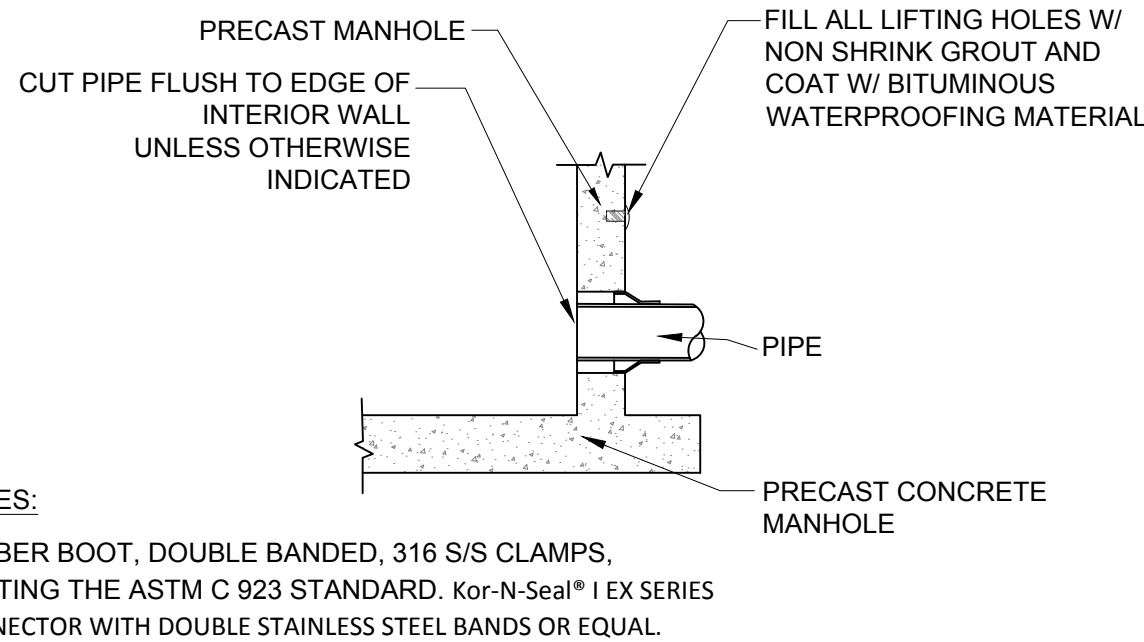
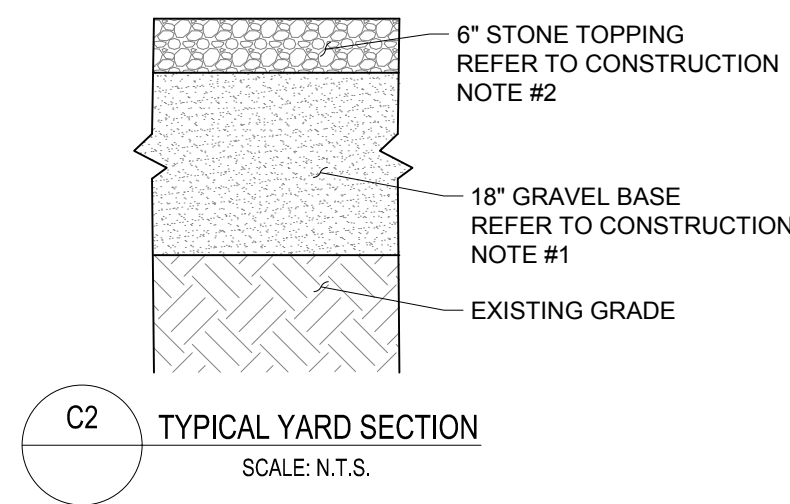
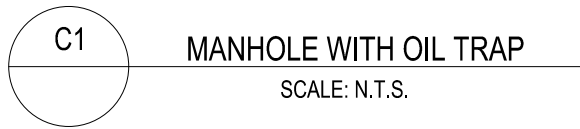
548-2-1	GENERAL ARRANGEMENT PLAN 34.5 S.G./12KV S.G. S/S
548-6-4 SH 1	CONDUIT PLAN & SCHEDULE 34.5 S.G./12KV S.G. S/S
548-6-9 SH 2	YARD LIGHTING PLAN PERIMETER SPILL 34.5 S.G./12KV S.G. S/S
548-6-9 SH 3	YARD LIGHTING WIRING DIAGRAM 34.5 S.G./12KV S.G. S/S
548-12-2	YARD ERECTION MATERIAL LIST (ABOVE GROUND)



PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							YARD LIGHTING & SECURITY PLAN 34.5 S.G./12KV S.G. S/S					
								FOREST AVE S/S			PORTLAND, ME		
								BY	ASG/BMC	SCALE: 1/8" = 1' - 0"	FILE: 548-0006-009 SH 001.dwg		
								CK	RS/BMC	NO.			
								APP	SMB/BMC				
								DATE	11/11/2019			548-0006-009 SH 001	0-0B
	REV	DESCRIPTION	DATE	BY	CK	APP							



US STANDARD SIEVE SIZE	% BY WEIGHT PASSING SIEVE
1"	100
3/4"	90-100
3/8"	20-55
#4	0-10
#8	0-5
#200	0-5



ID	A (MIN.)
4"-12"	0'-10"
15"	0'-10"
18"	0'-10"
24"	0'-6"
30"	0'-6"
36"	0'-6"

NOTE: SHORE TRENCH EXCAVATION AS REQUIRED TO MINIMIZE EXCAVATION AND IMPACTS TO ADJACENT UTILITIES STRUCTURES OR PAVEMENT. TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH OSHA REQUIREMENTS.



PE STAMP

AVANGRID ENGINEERING

CONFIDENTIAL, PROPRIETARY and
TRADE SECRET INFORMATION

Property of AVANGRID

PRELIMINARY
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NOT FOR CONSTRUCTION

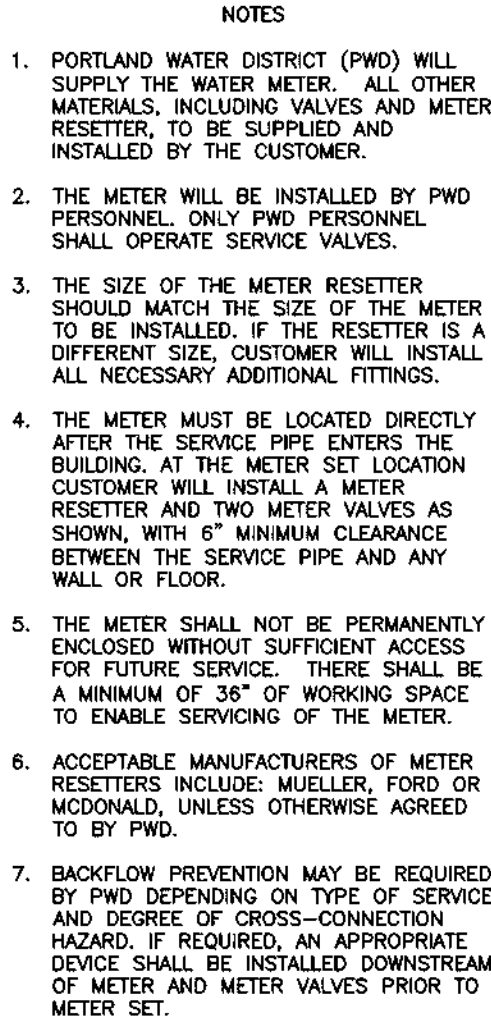
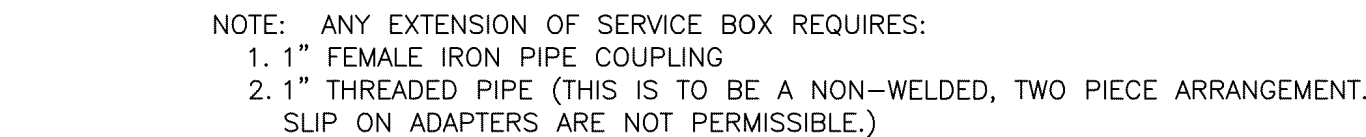
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	BURNS MCDONNELL
INFO	BURNS & MCDONNELL 27 PEARL ST., 2ND FLOOR PORTLAND, ME 04101 207-517-8460

ANSI D 10/24/2017 8:50 AM



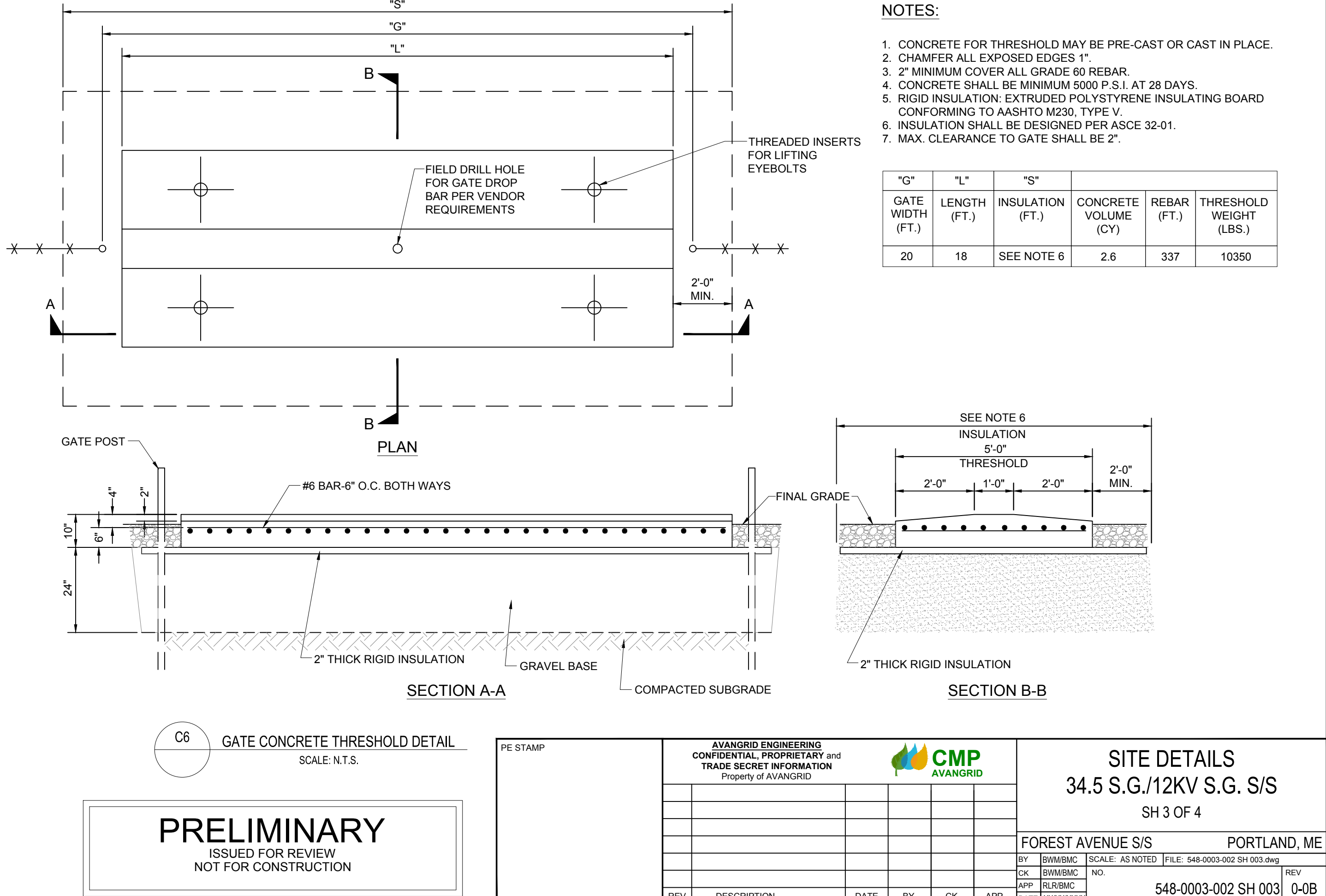
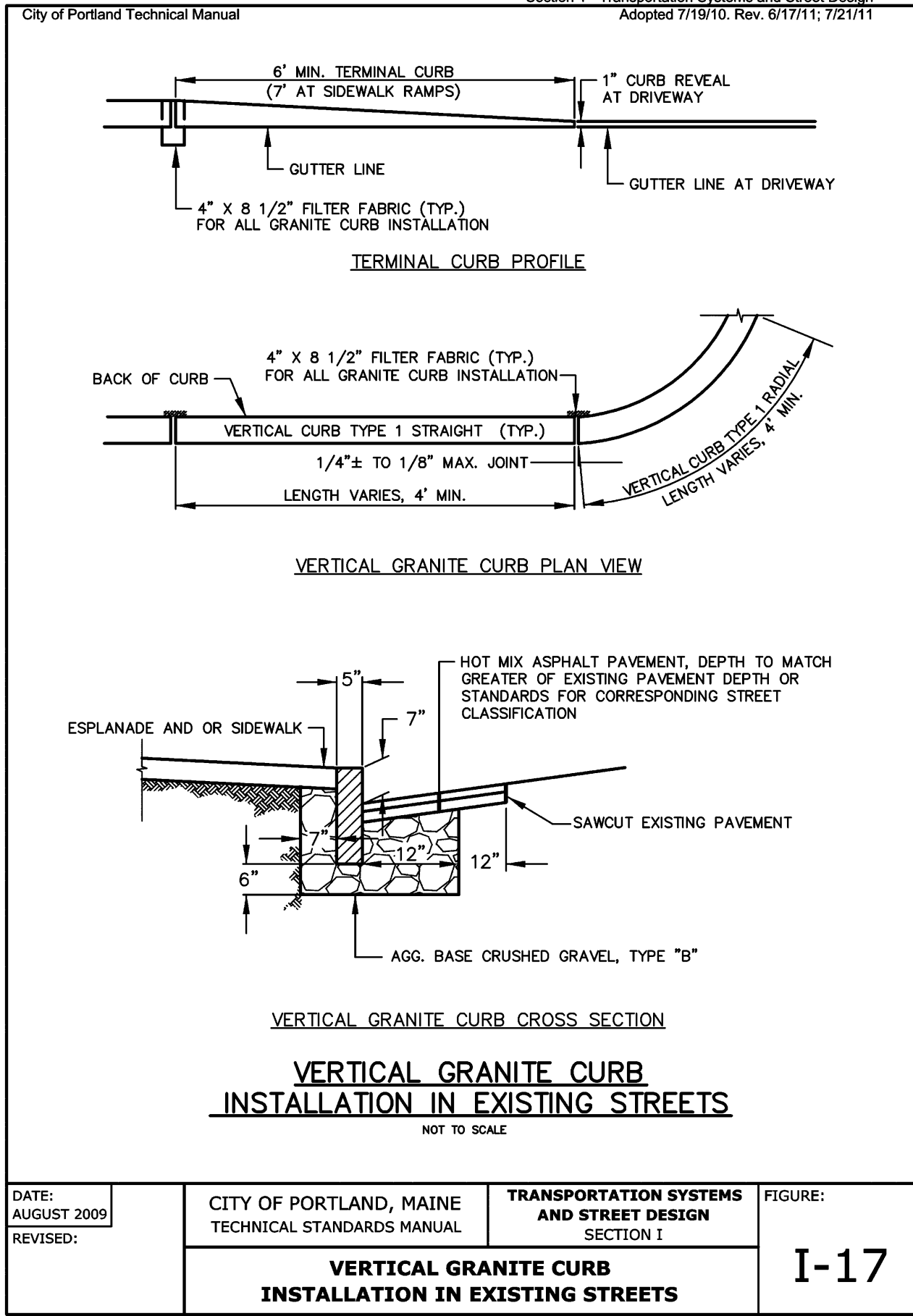
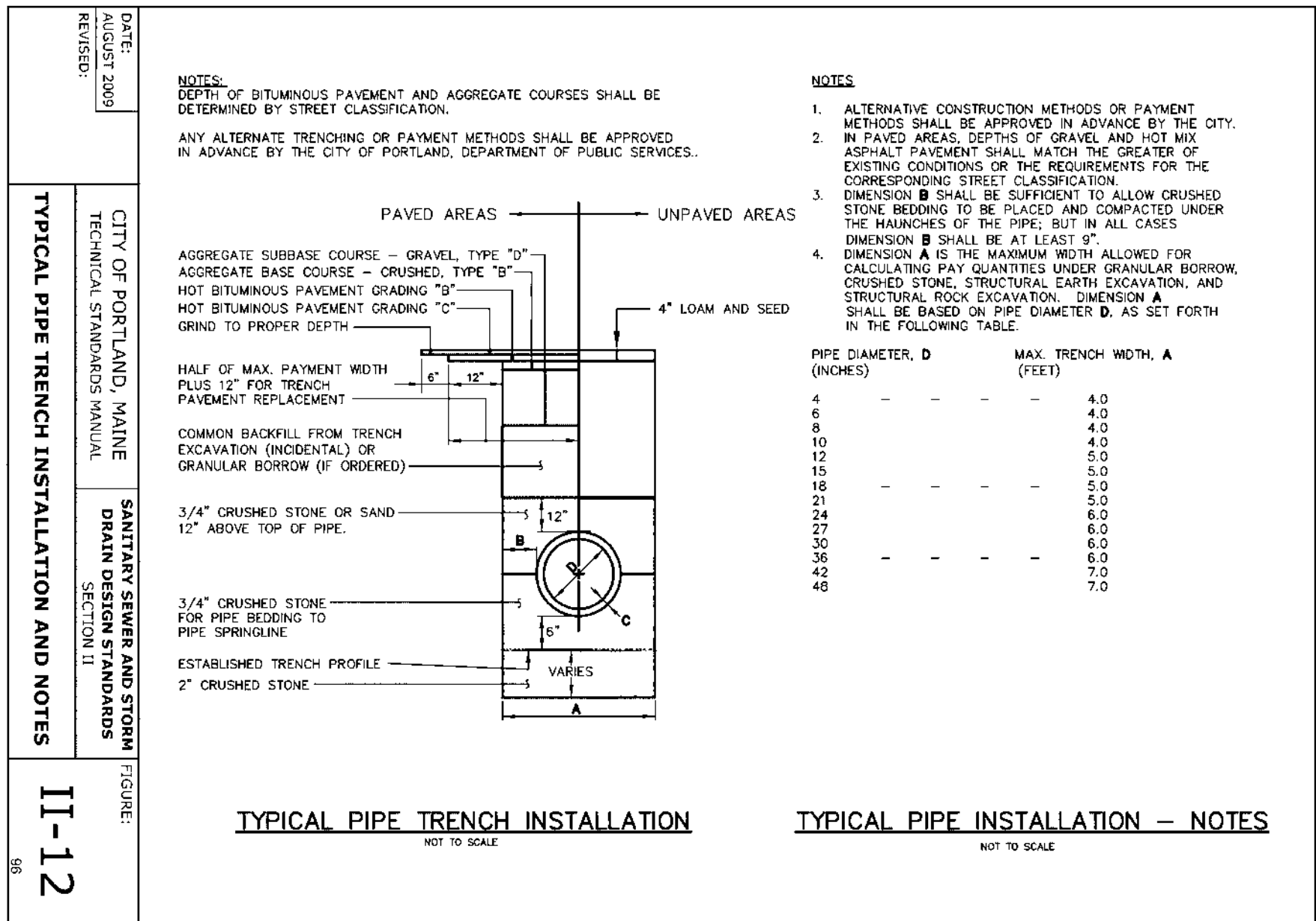
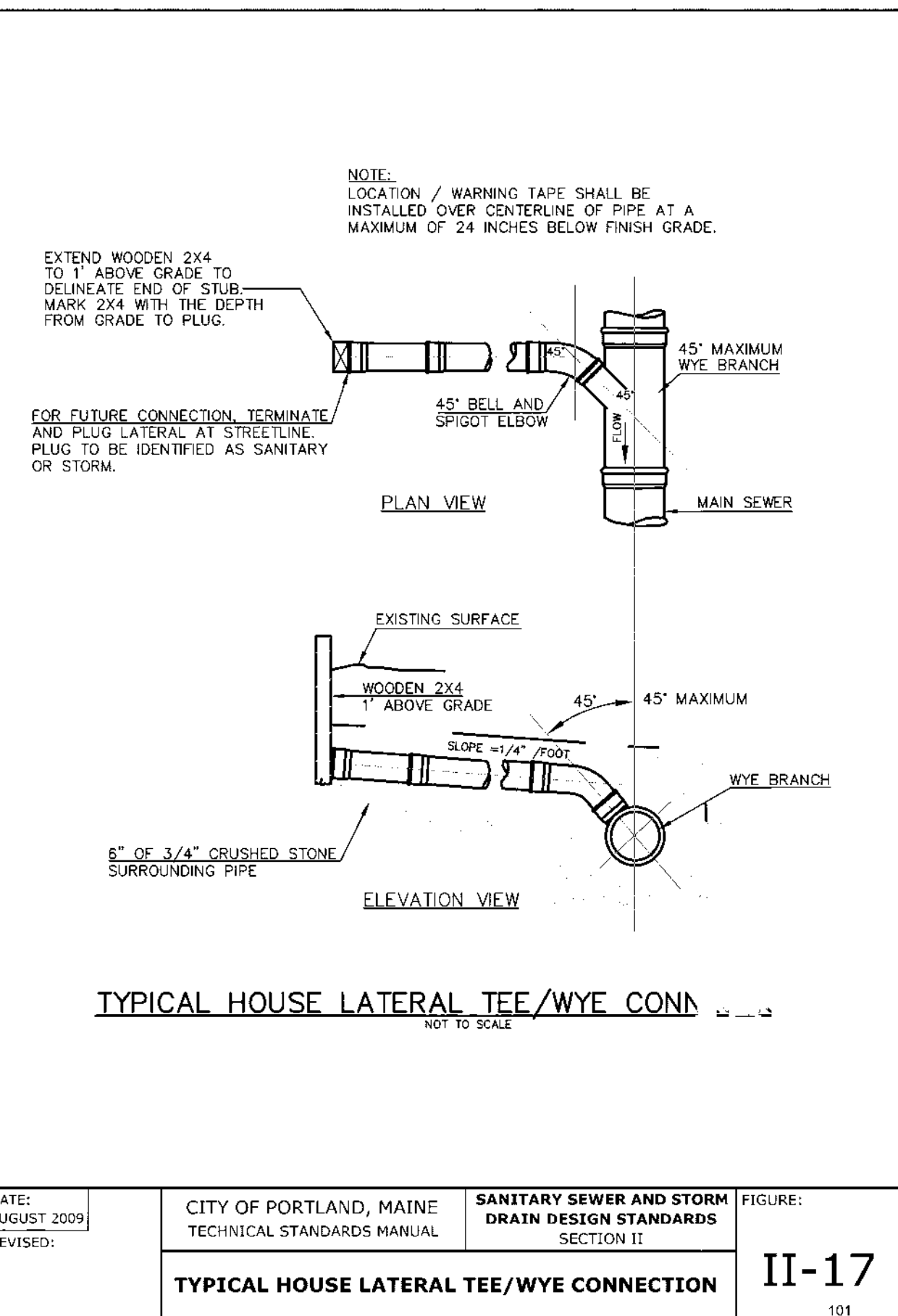
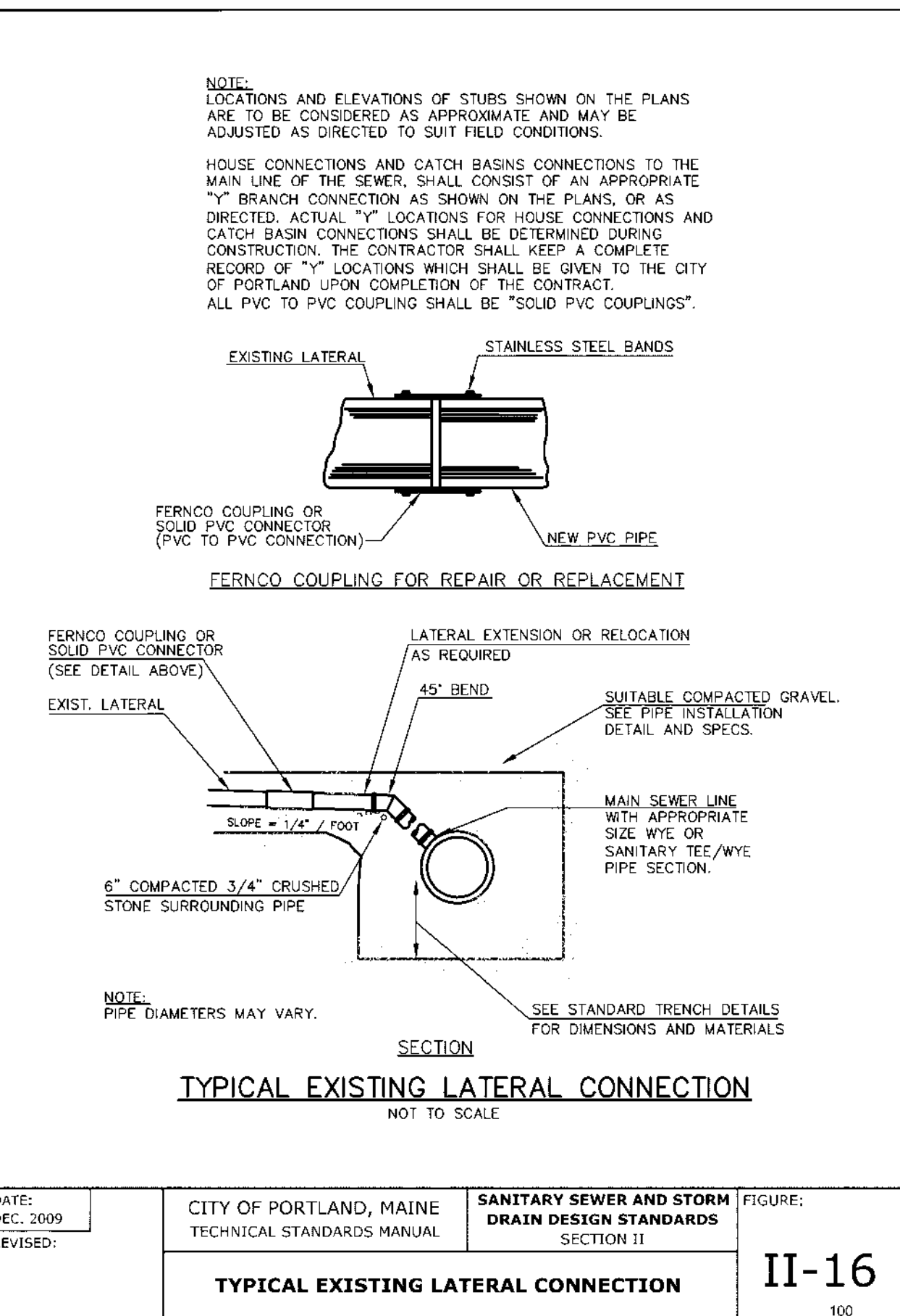
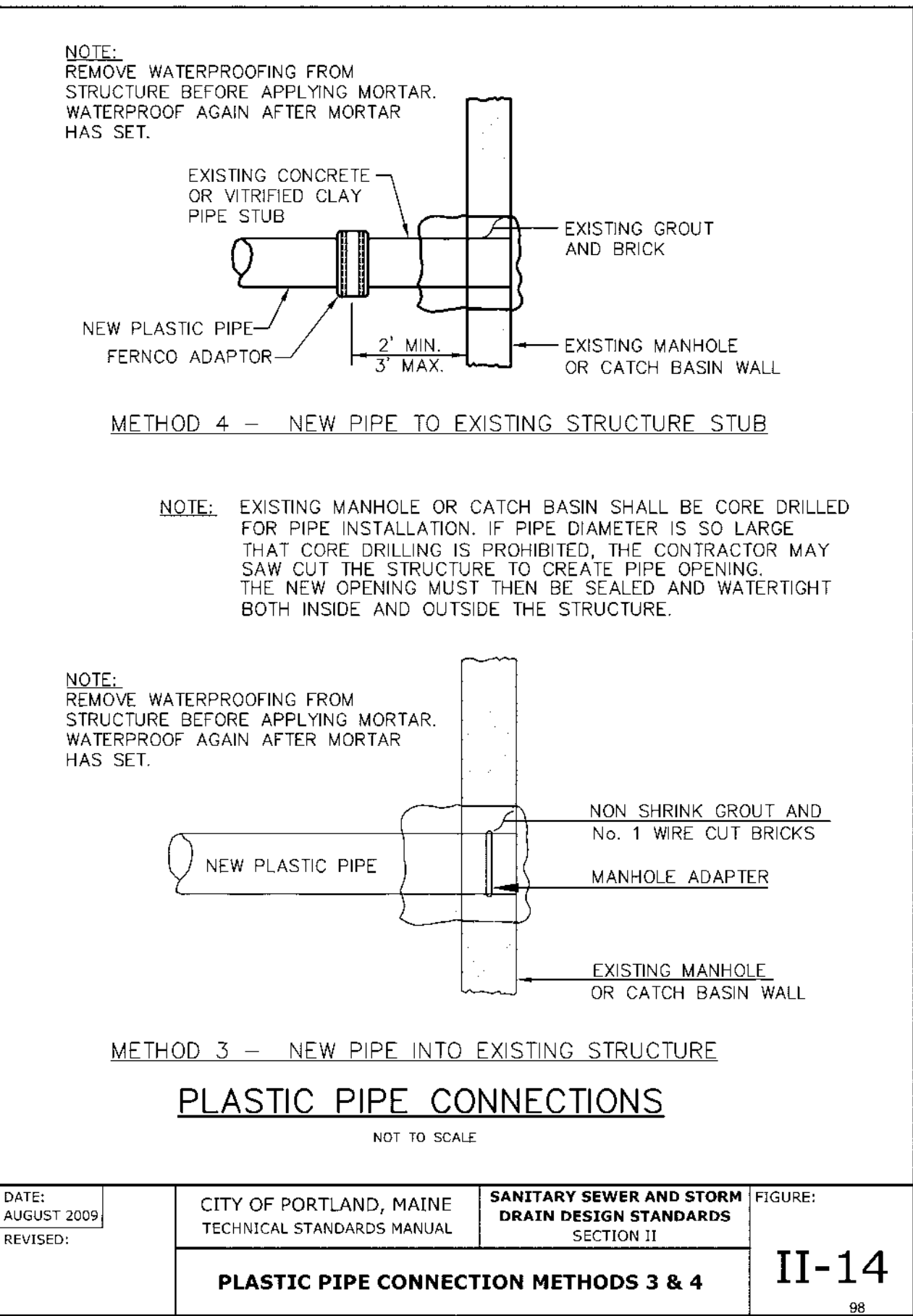
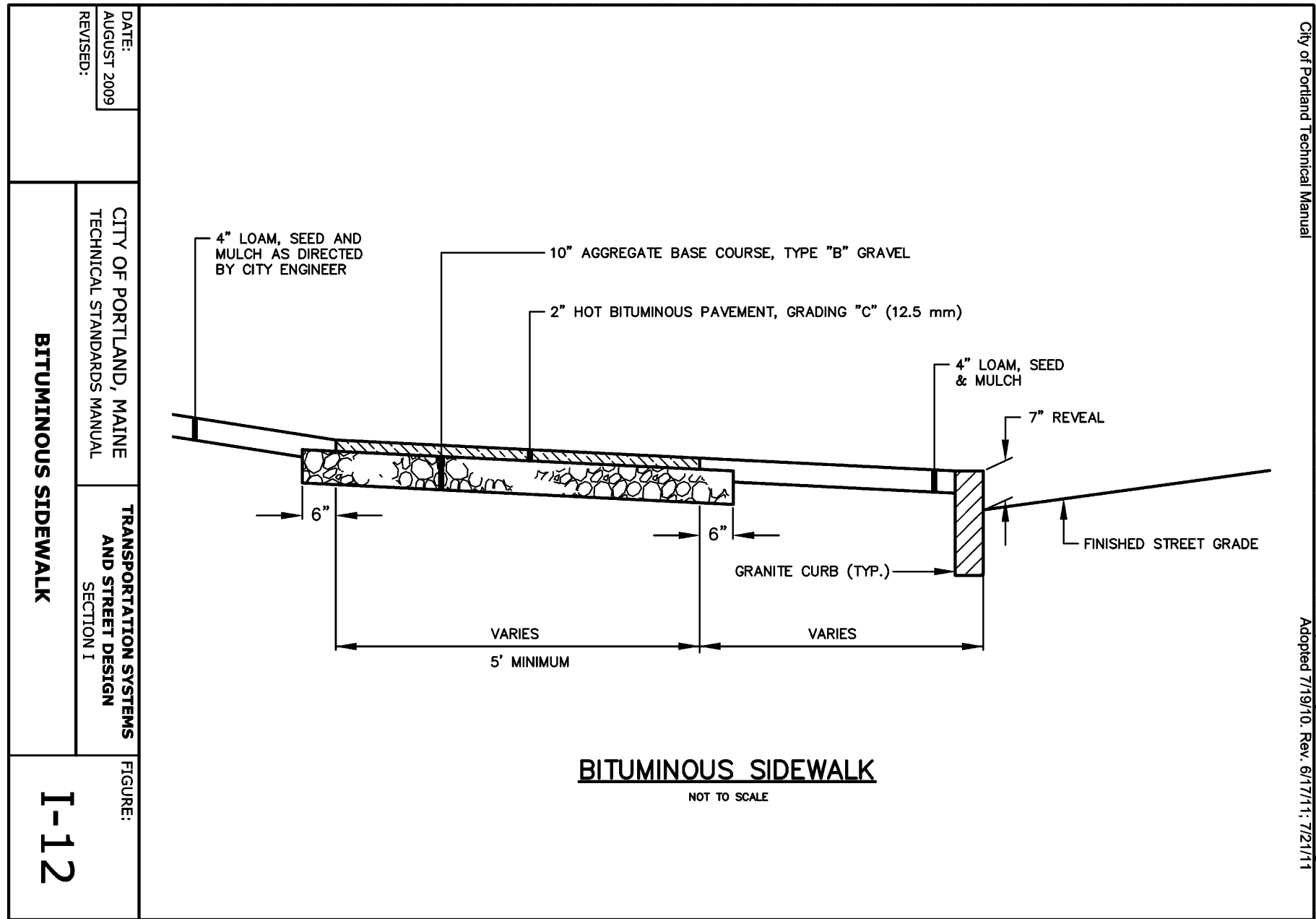
- METER NOTES

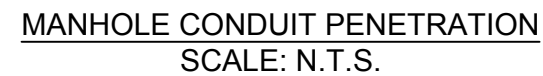
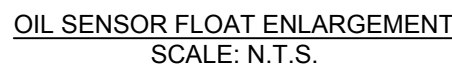
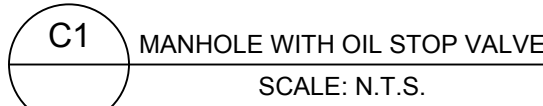


 Portland Water District ASSET MANAGEMENT & PLANNING DEPARTMENT 225 DOUGLASS ST, PORTLAND ME 04104-3553 (207) 207-774-5961 • 207-7761-8307 (FAX) • WWW.PWD.ORG	DATE	REVISION	SCALE: NTS	HORIZONTAL METER INSTALLATION (5/8" TO 1")	
	09/24/14	METER RESETTER SIZING	DATE: 06/15/14	STANDARD METER SET DETAILS	
	06/22/15	PIPE MATERIAL	DRAWN BY: TAW		
			CHECKED BY: JRS		
			APPROVED BY: GSJ	PROJECT NO: NA	SHEET:
			FILE: WS01.DWG		1 OF 1

PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							SITE DETAILS 34.5 S.G./12KV S.G. S/S SH 2 OF 4					
								FOREST AVENUE S/S		PORTLAND, ME			
								BY	BIM/BMC	SCALE: AS NOTED	FILE: 548-0003-002 SH 002.dwg		
								CK	RL/RMBC	NO.			
								APP	DATE	XXXX/XX/XXXX			
	REV	DESCRIPTION	DATE	BY	CK	APP		548-0003-002 SH 002				REV	0-0B

PRELIMINARY
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

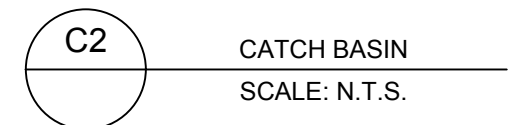




- OIL STOP VALVE ENLARGEMENT
SCALE: N.T.S.

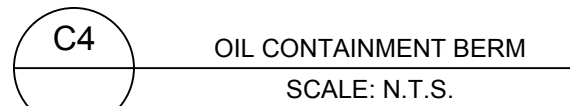


1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL SHALL CONFORM TO LATEST ASTM A185 SPEC.
3. STRUCTURE SHALL BE DESIGNED FOR H-20 LOADING PER AASHTO HS-20-44, AND IN ACCORDANCE WITH ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."



CATCH BASIN
SCALE: N.T.S.

1. SOIL FILTER MEDIA SHALL CONSIST OF A SILTY SAND SOIL OR SOIL MIXTURE COMBINED WITH A MATURE, MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH 20% TO 25% BY VOLUME (NO LESS THAN 10% BY DRY WEIGHT). THE RESULTING MIXTURE SHALL HAVE 8% TO 12% PASSING THE NO. 200 SIEVE AND A CLAY CONTENT OF LESS THAN 2%. THE PROPORTIONS OF THE MIXTURE CAN BE ADJUSTED SO IT WILL CONTAIN SUFFICIENT FINES AND ORGANIC MATTER.
2. CONTRACTOR SHALL SUBMIT SITE SPECIFIC MIX DATA FOR REVIEW AND APPROVAL BY ENGINEER. A SAMPLE SOIL FILTER MEDIA MIX IS AS FOLLOWS:
 - 50% SAND
 - 20% SANDY LOAM TO FINE SANDY LOAM
 - 30% MATURE COMPOSTED WOODY FIBERS AND FINE SHREDDED BARK, SUPERHUMUS OR EQUIVALENT



OIL CONTAINMENT BERM
SCALE: N.T.S.



PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							SITE DETAILS 34.5 S.G./12KV S.G. S/S SH 4 OF 4			
								FOREST AVENUE S/S		PORTLAND, ME	
								BY BWM/BMC	SCALE: AS NOTED	FILE: 548-0003-002 SH 004.dwg	
								CK RLR/BMC	NO.		
								APP RLR/BMC			
								DATE: XX/XX/XXXX			
								548-0003-002 SH 004			
	REV	DESCRIPTION	DATE	BY	CK	APP					

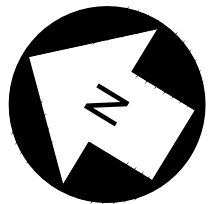
SITE DETAILS
34.5 S.G./12KV S.G. S/S
SH 4 OF 4

FOREST AVENUE S/S		PORTLAND, ME	
BY	BWM/BMC	SCALE: AS NOTED	FILE: 548-0003-002 SH 004.dwg

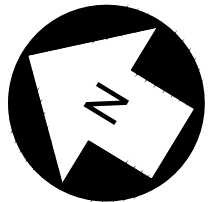
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APP	RLR/BMC			
DATE	XX/XX/XXXX			

 BURNS & MCDONNELL	INFO
BURNS & MCDONNELL 27 PENNSYLVANIA AVE PORTLAND, ME 04101 207-517-8460	

INFO



BY	WD/BMC	SCALE: 1/4" = 1'-0"	FILE: 548-0004-004.dwg
CHK	MRD/BMC	NO.	REV
APP	XXX/BMC		548-0004-004 0-0B
DATE	YY/YY/XXXX		

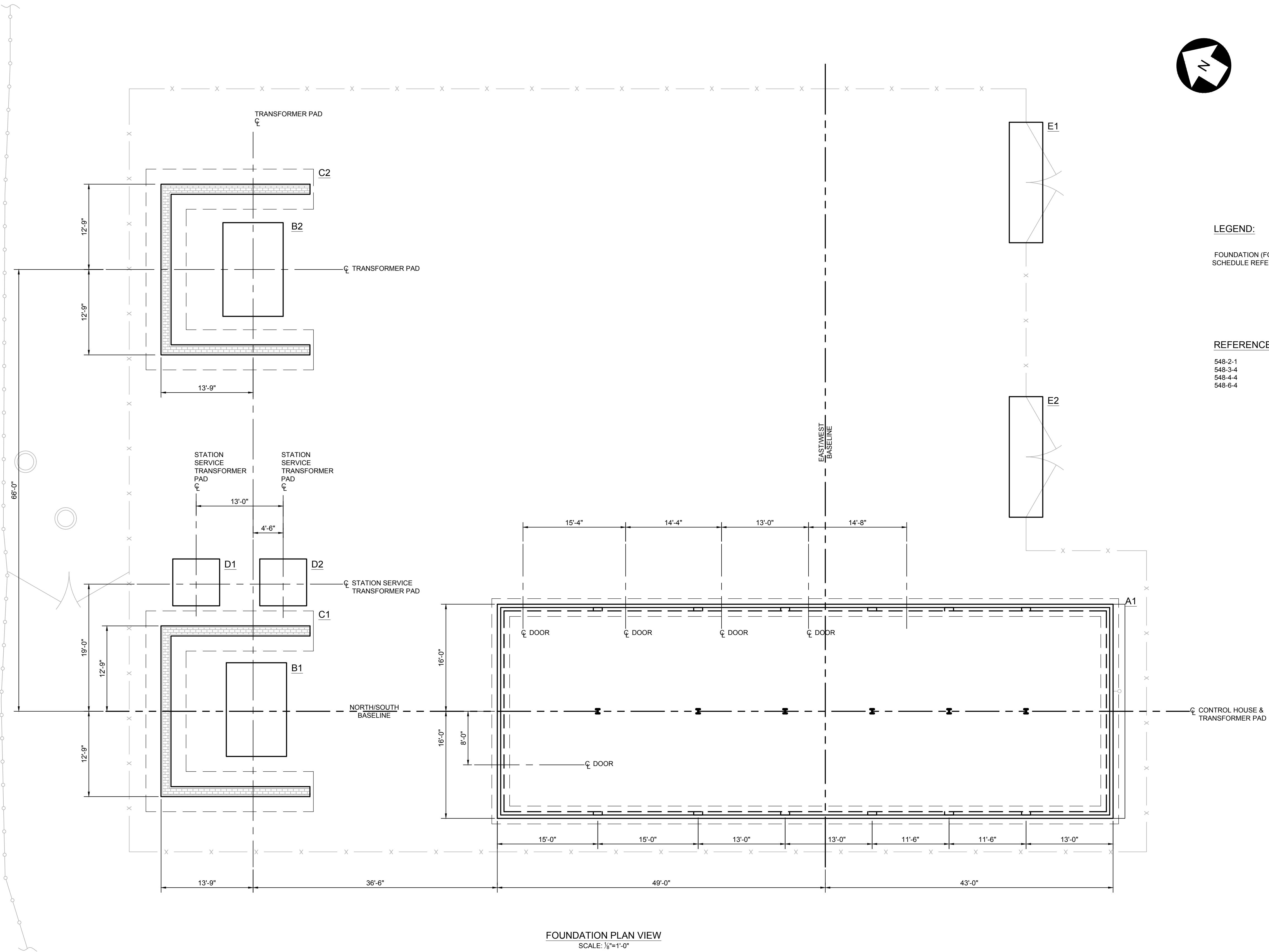


LEGEND:

FOUNDATION (FOR FDN. SCHEDULE REFERENCE)
SPECIFIC FOUNDATION LOCATION (FOR TESTING REFERENCE)
G2

REFERENCE DRAWINGS:

548-2-1 GENERAL ARRANGEMENT PLAN 34.5 S.G./12KV S.G. S/S
548-3-4 GRADING & DRAINAGE PLAN 34.5 S.G./12KV S.G. S/S
548-4-4 CONTROL HOUSE FOUNDATION 34.5 S.G./12KV S.G. S/S
548-6-4 CONDUIT PLAN & SCHEDULE 34.5 S.G./12KV S.G. S/S

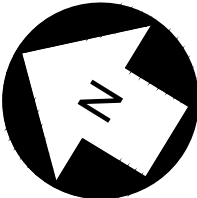


FOUNDATION PLAN VIEW
SCALE: 1/8"=1'-0"

FOR PERMITTING
PURPOSES ONLY
NOT FOR CONSTRUCTION

FOUNDATION SCHEDULE						
MARK	QUANTITY	DESCRIPTION	DWG. NUMBER	TOC EL.	CY CONC. EA.	CY CONC. TOT.
A	1	GIS/CONTROL ENCLOSURE FOUNDATION	548-0004-004	17.15'	281.2	281.2
B	2	34.5/12KV TRANSFORMER FOUNDATION	548-0003-007	13.5'	21.0	42.0
C	2	34.5/12KV TRANSFORMER FIREWALL FOUNDATION	548-0003-008	13.5'	39.55	79.1
D	2	34.5kv STATION SERVICE TRANSFORMER FOUNDATION	548-0003-009	13.5'	5.0	10.0
E	2	PRECAST GATE THRESHOLD 5'x18'x10"	548-0003-002 SH3	12.8'	2.6	5.2

PE STAMP		AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID				FOUNDATION PLAN 34.5 S.G./12KV S.G. S/S	
						FOREST AVENUE S/S	
						PORTLAND, ME	

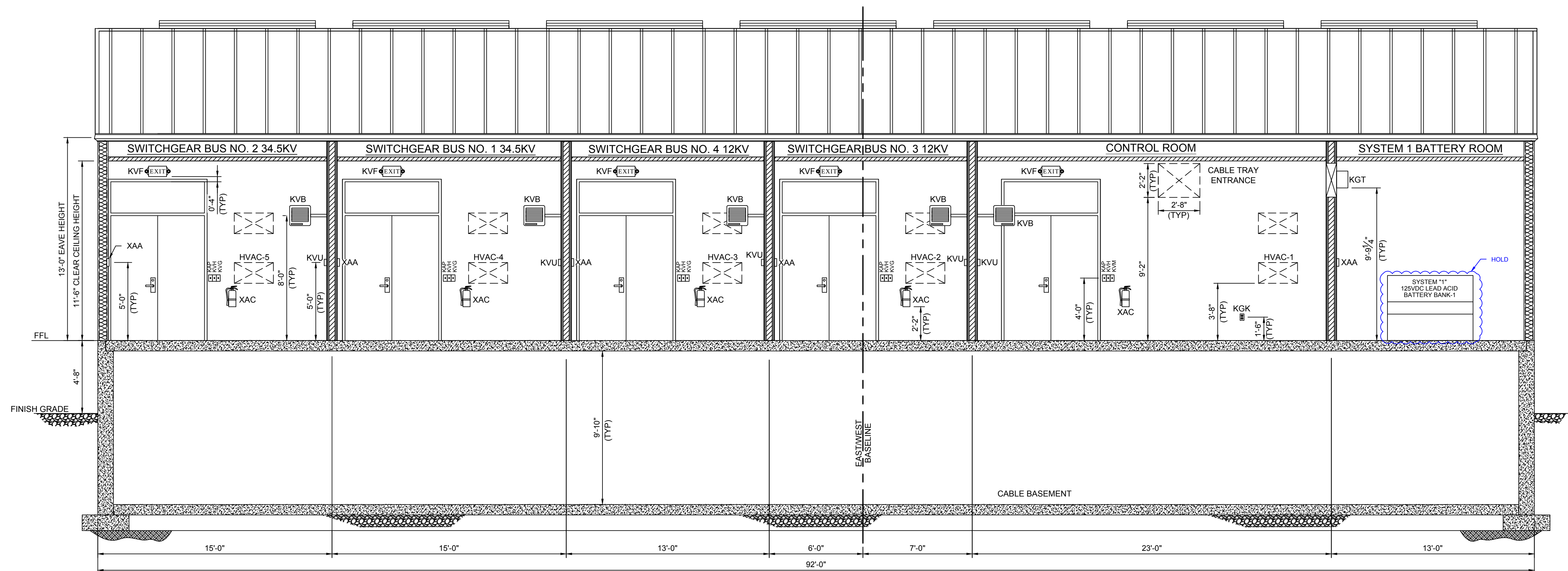


LOGO		INFO
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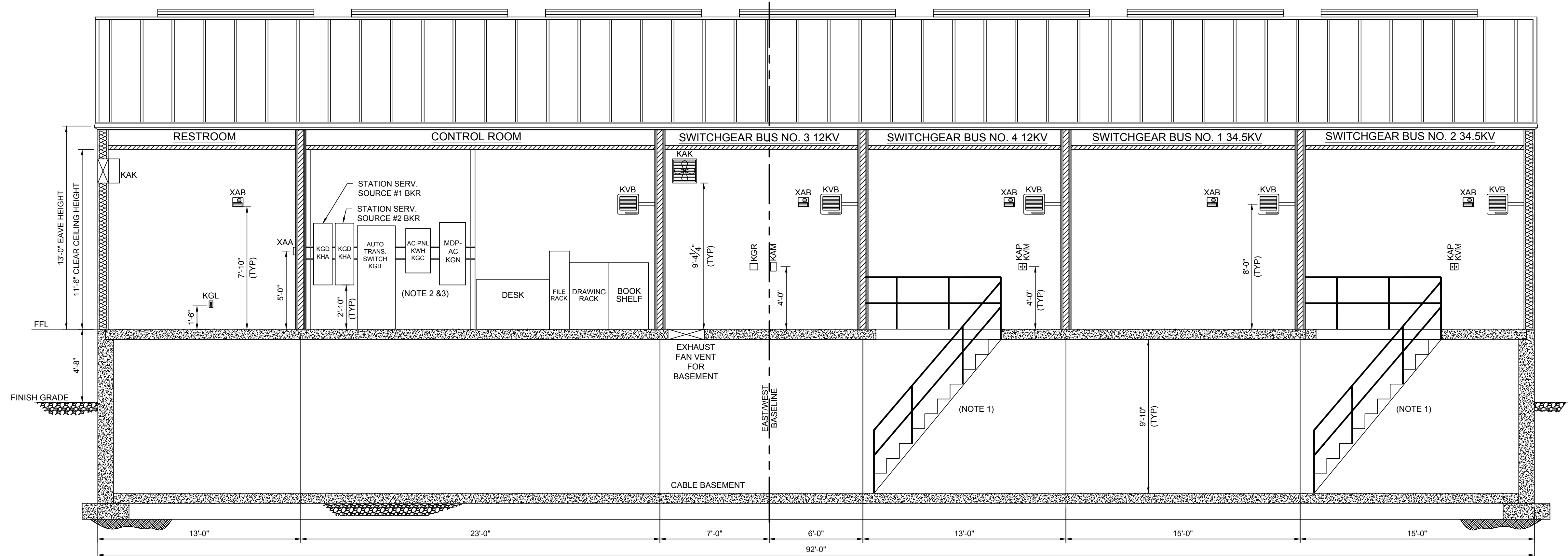
PE STAMP	 AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID		CONTROL HOUSE FOUNDATION 34.5 S.G./12KV S.G. S/S
FOREST AVE S/S		PORTLAND, ME	
BY WCD/BMC CK WCD/BMC APP XXX/BMC		SCALE: 1/4" = 1'-0" FILE: 548-0004-005.dwg NO	
DATE XXXX/XXXX/XXXX		REV 548-0004-005 0-0B	

 BURNS & MCDONNELL	INFO
BURNS & MCDONNELL 27 PEARL ST. 2ND FLOOR PORTLAND, ME 04101 207-517-8460	

ANSI D 12/17/2019



A-A SECTION
548-5-3 SCALE : 1/4" = 1'-0"



B-B SECTION
548-5-3 SCALE : 1/4" = 1'-0"

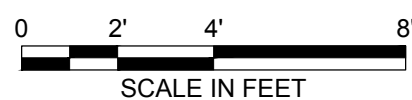
NOTES:

1. REFER TO DRAWING 548-4-9 FOR STAIRCASE DETAILS.
2. ELECTRICAL EQUIPMENT SHOWN LOCATED ON THE BUILDING INTERIOR WALL SHALL BE MOUNTED ON STEEL UNISTRUT AND ATTACHED TO THE BUILDING STRUCTURE AND SUPPORTED FROM THE CONCRETE FLOOR. CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND INDUSTRY PRACTICE.
3. REFER TO DRAWING 548-5-5 SH 2 FOR TYPICAL DETAIL OF WALL MOUNTED EQUIPMENT.

REFERENCE DRAWINGS:

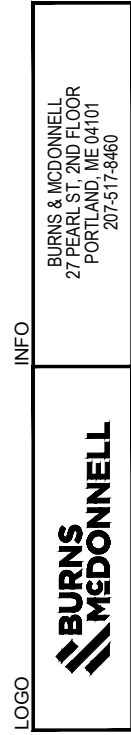
548-4-9
548-5-3
548-12-2
548-12-3

STAIR DETAILS
CONTROL HOUSE PLAN 34.5KV & 12KV SWITCHGEAR
YARD ERECTION MATERIAL LIST (ABOVE GROUND)
CONTROL HOUSE ERECTION MATERIAL LIST

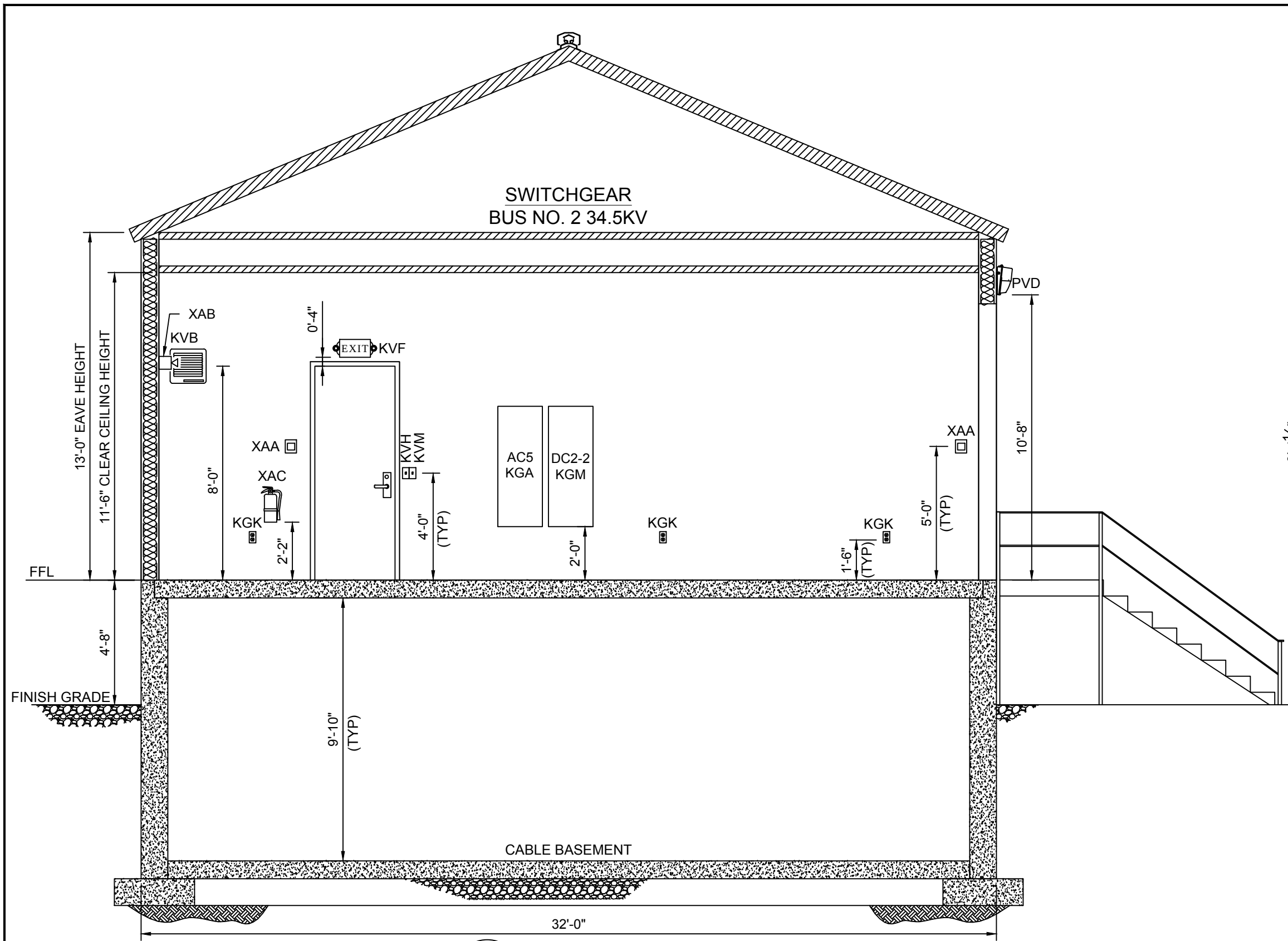


PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							CONTROL HOUSE SECTION A-A & B-B SH 1 OF 3			
								FOREST AVE S/S		PORTLAND, ME	
								BY	GJK/BMC	SCALE: 1/4" = 1'-0"	FILE: 548-0005-004 SH 001.dwg
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								APP	SM/MC	548-0005-004 SH 001	
								DATE	11/17/2019		0-00
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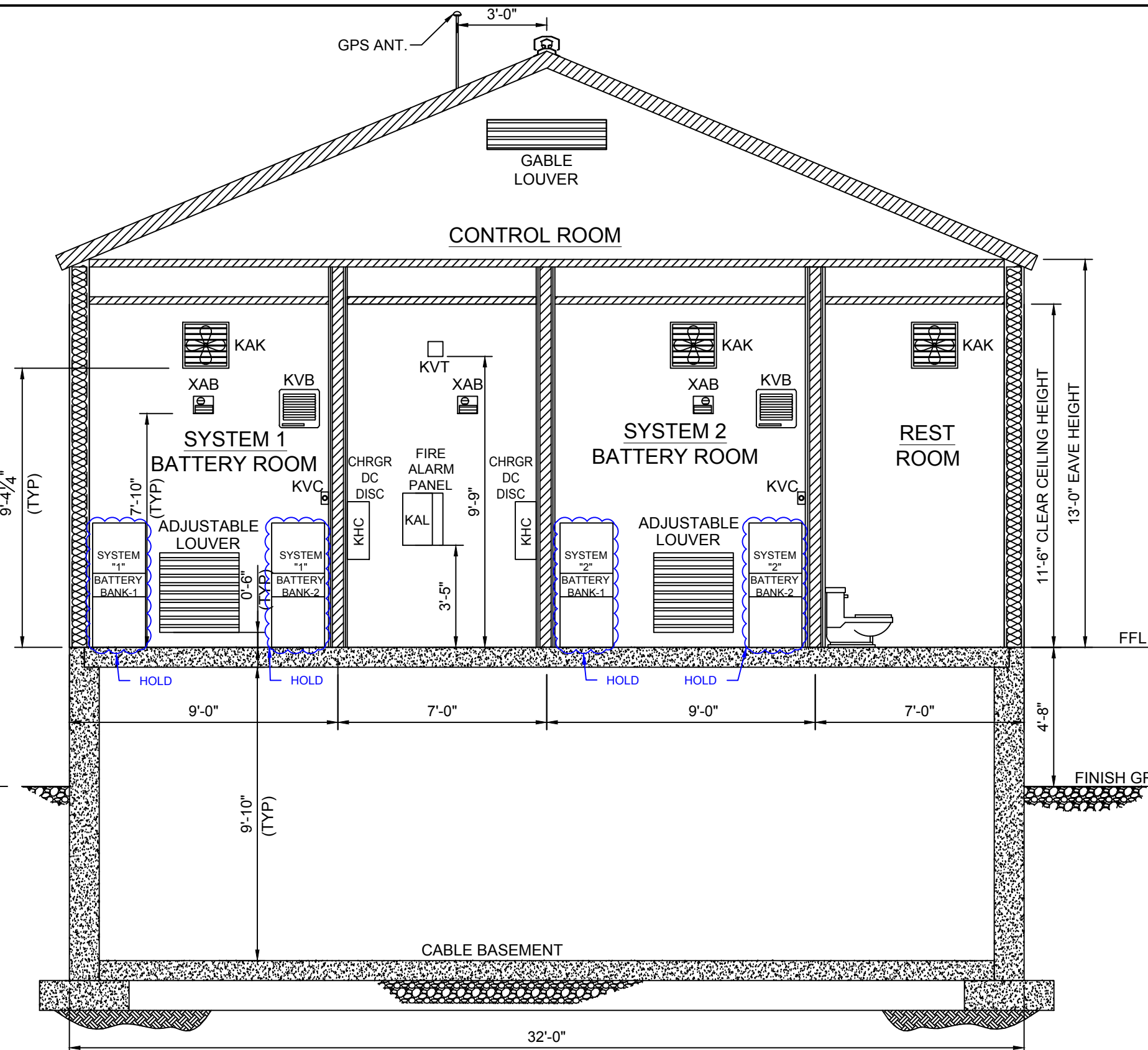
REV	DATE	BY	CHK	APP	DESCRIPTION
00C	12/17/2019	GMK	RS	SM	ISSUED FOR PERMITTING
00B	11/26/2019	GMK	RS	SM	8% ABOVE GROUND/IFR
00A	12/14/2018	NJM	SM	ML	3% ABOVE GROUND/IFR



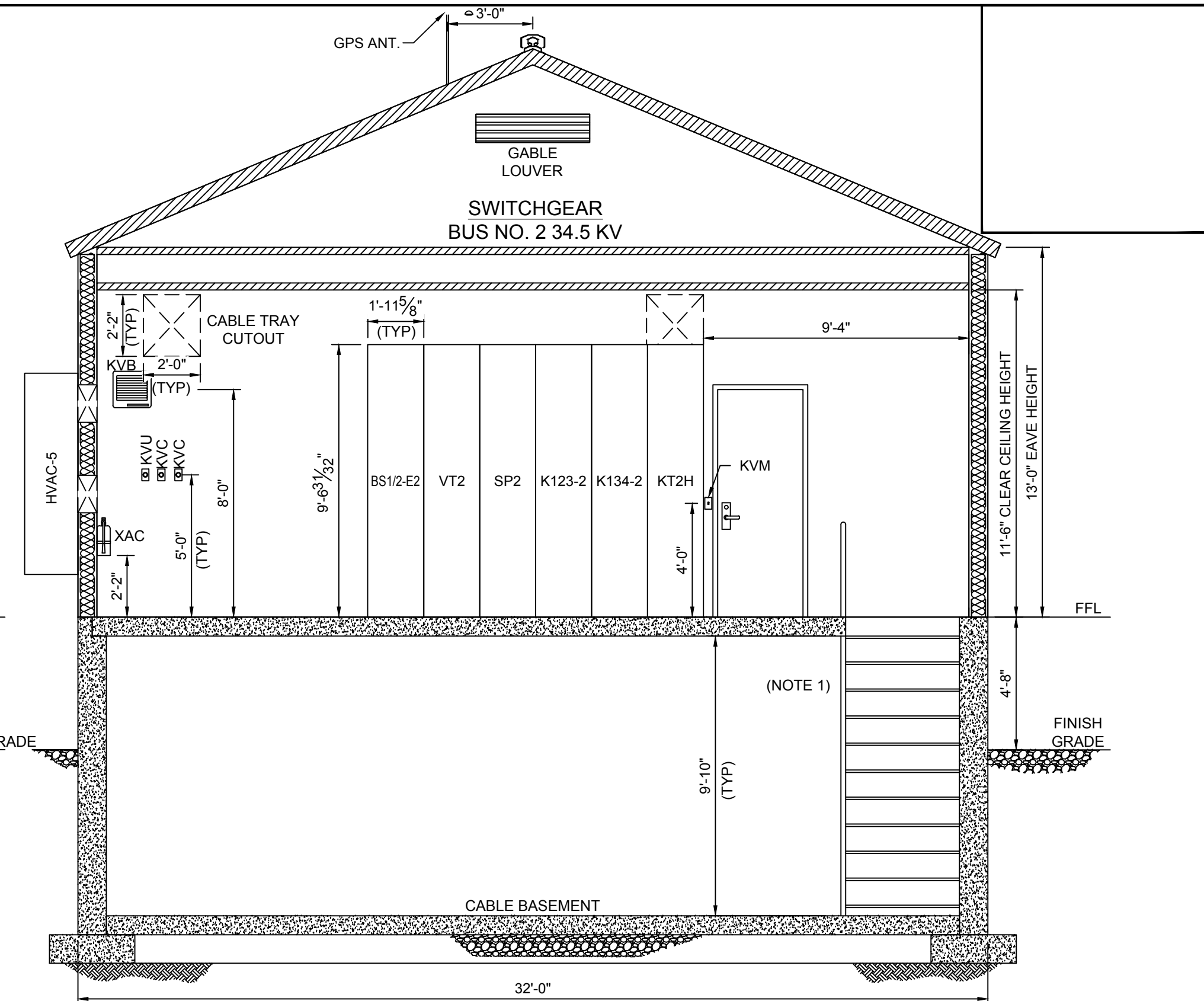
ANSI D 12/17/2019



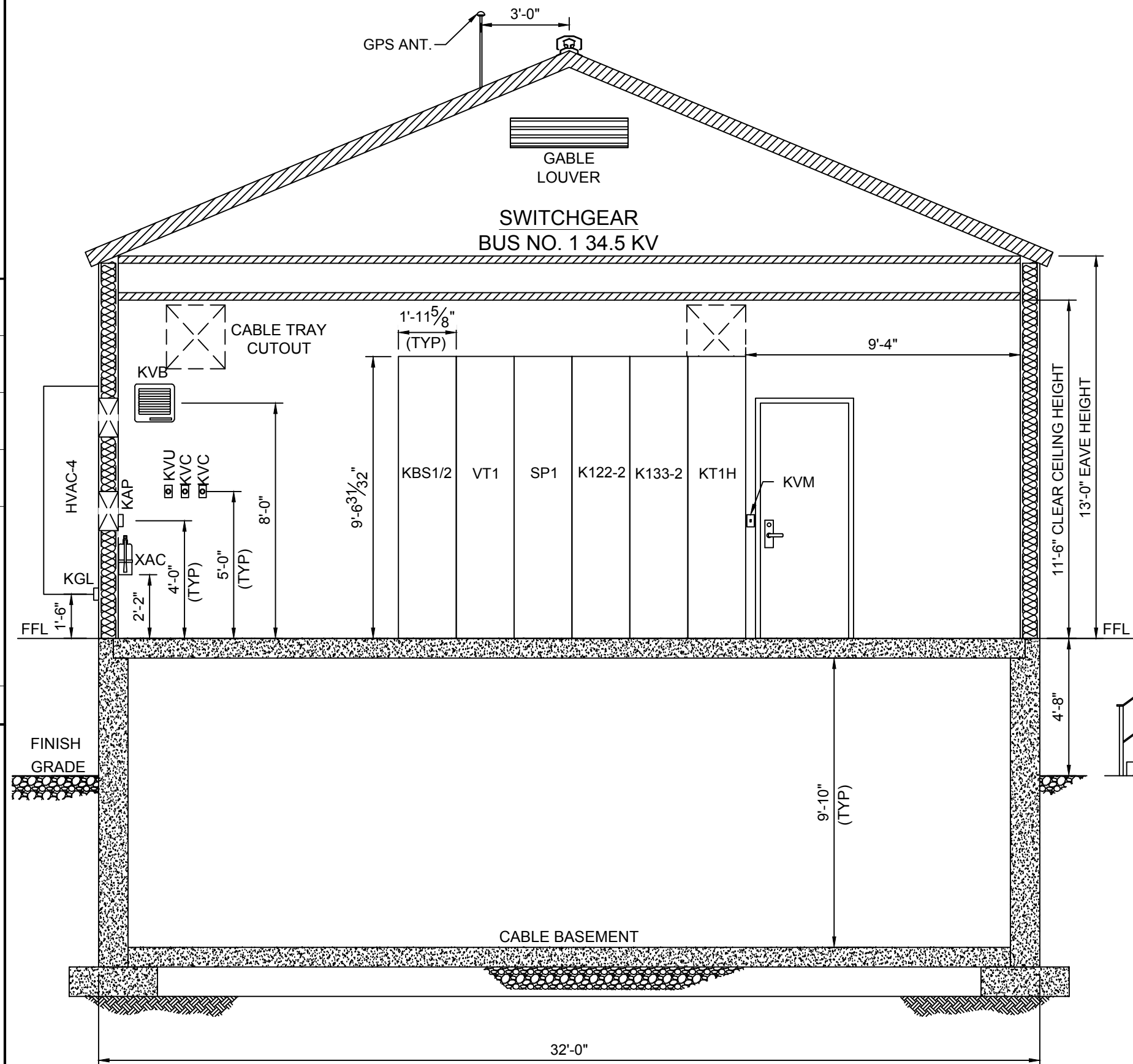
C-C SECTION
548-5-3 SCALE : 1/4" = 1'-0"



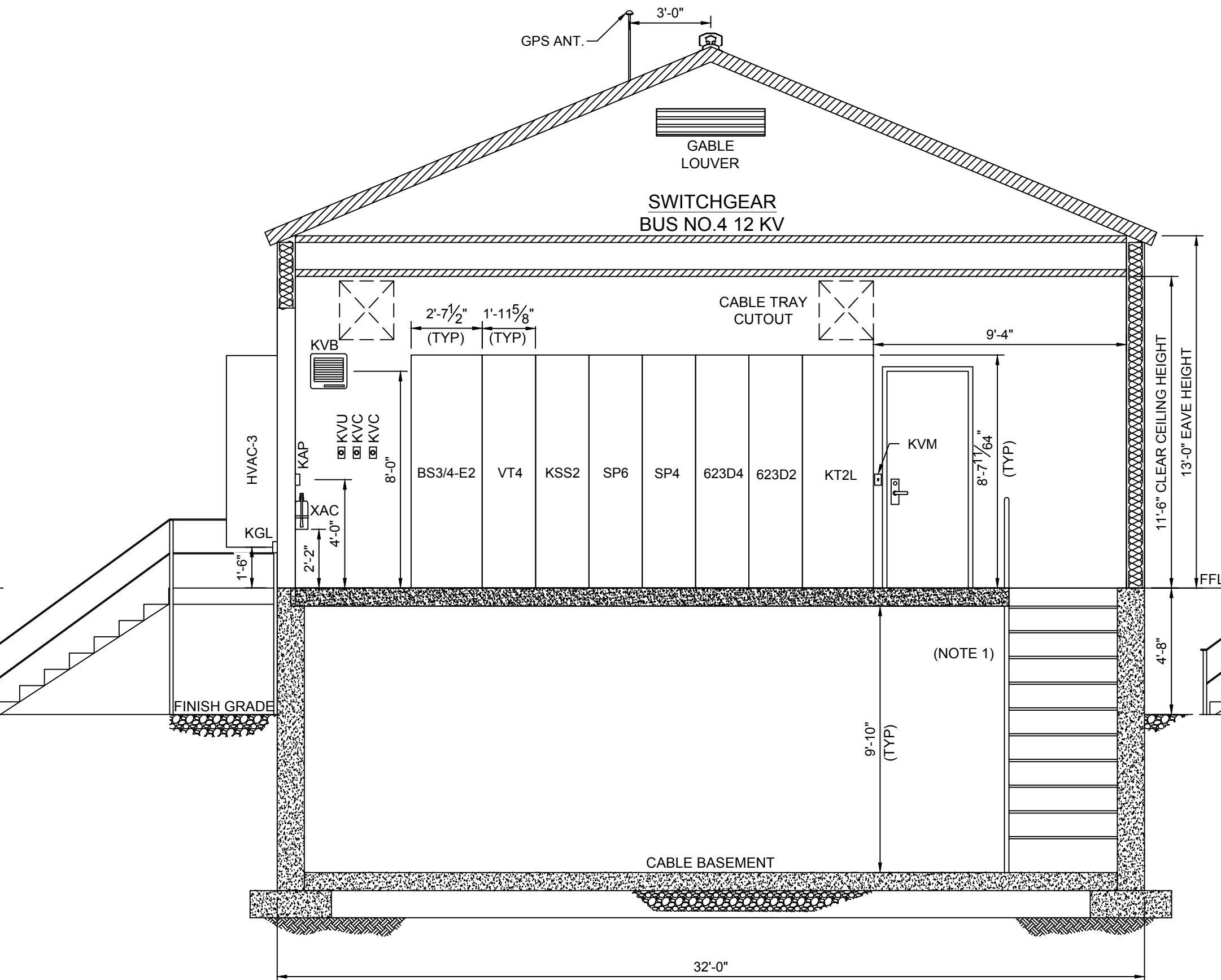
D-D SECTION
548-5-3 SCALE : 1/4" = 1'-0"



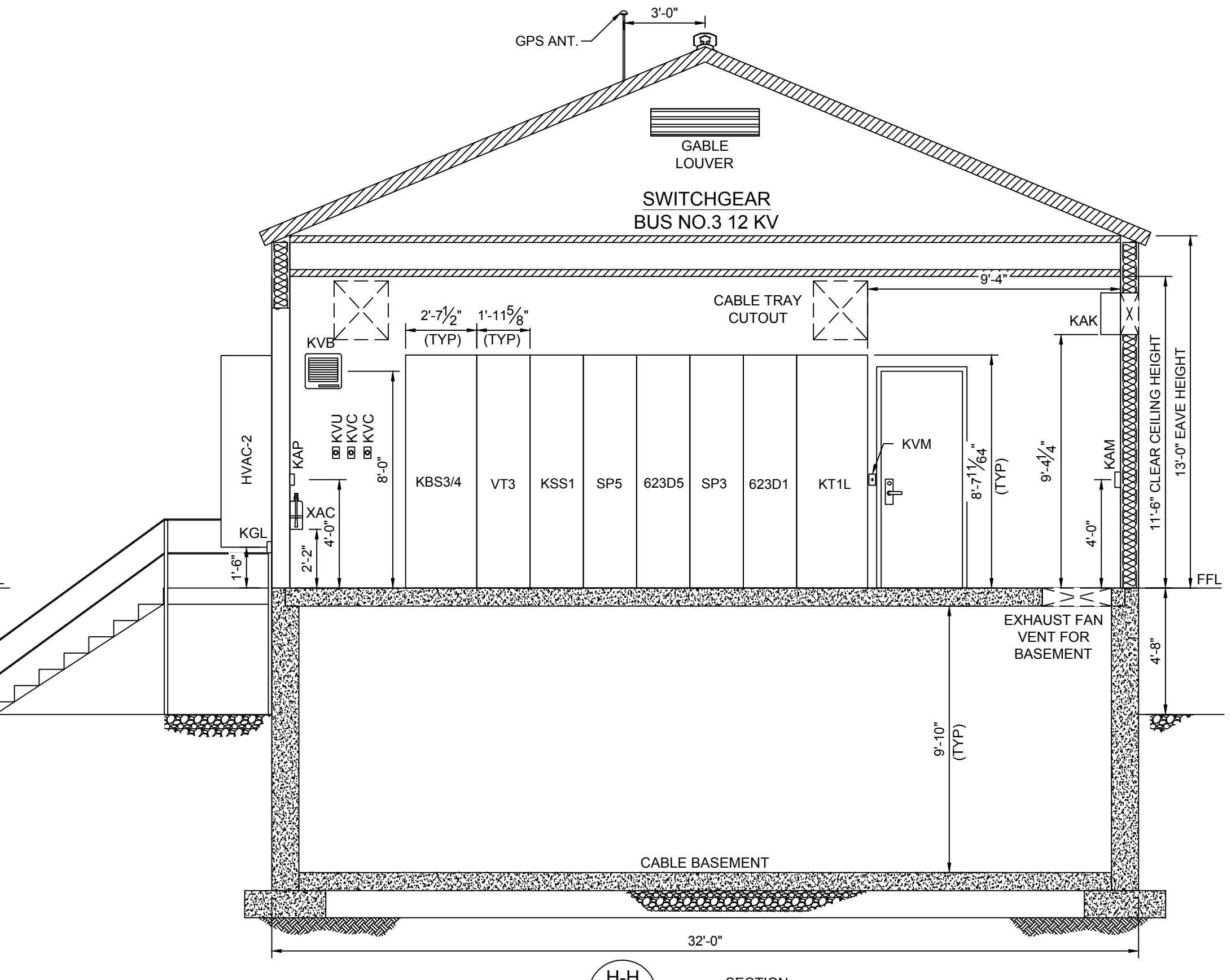
E-E SECTION
548-5-3 SCALE : 1/4" = 1'-0"



F-F SECTION
548-5-3 SCALE : 1/4" = 1'-0"



G-G SECTION
548-5-3 SCALE : 1/4" = 1'-0"



H-H SECTION
548-5-3 SCALE : 1/4" = 1'-0"

NOTES:

- REFER TO DRAWING 548-4-9 FOR STAIRCASE DETAILS.

REFERENCE DRAWINGS:

- 548-4-9 STAIR DETAILS
548-5-3 CONTROL HOUSE PLAN 34.5KV & 12KV SWITCHGEAR
548-12-2 YARD ERECTION MATERIAL LIST (ABOVE GROUND)
548-12-3 CONTROL HOUSE ERECTION MATERIAL LIST



PE STAMP		AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							CONTROL HOUSE SECTION C-C, D-D, E-E, F-F, G-G & H-H SH 2 OF 3	

REV	DESCRIPTION	DATE	BY	CK	APP
00C	ISSUED FOR PERMITTING	12/17/2019	GMK	RS	SM
00B	80% ABOVE GROUND I/F	11/26/2019	GMK	RS	SM
00A	30% ABOVE GROUND I/F	12/14/2018	NJM	SM	NL

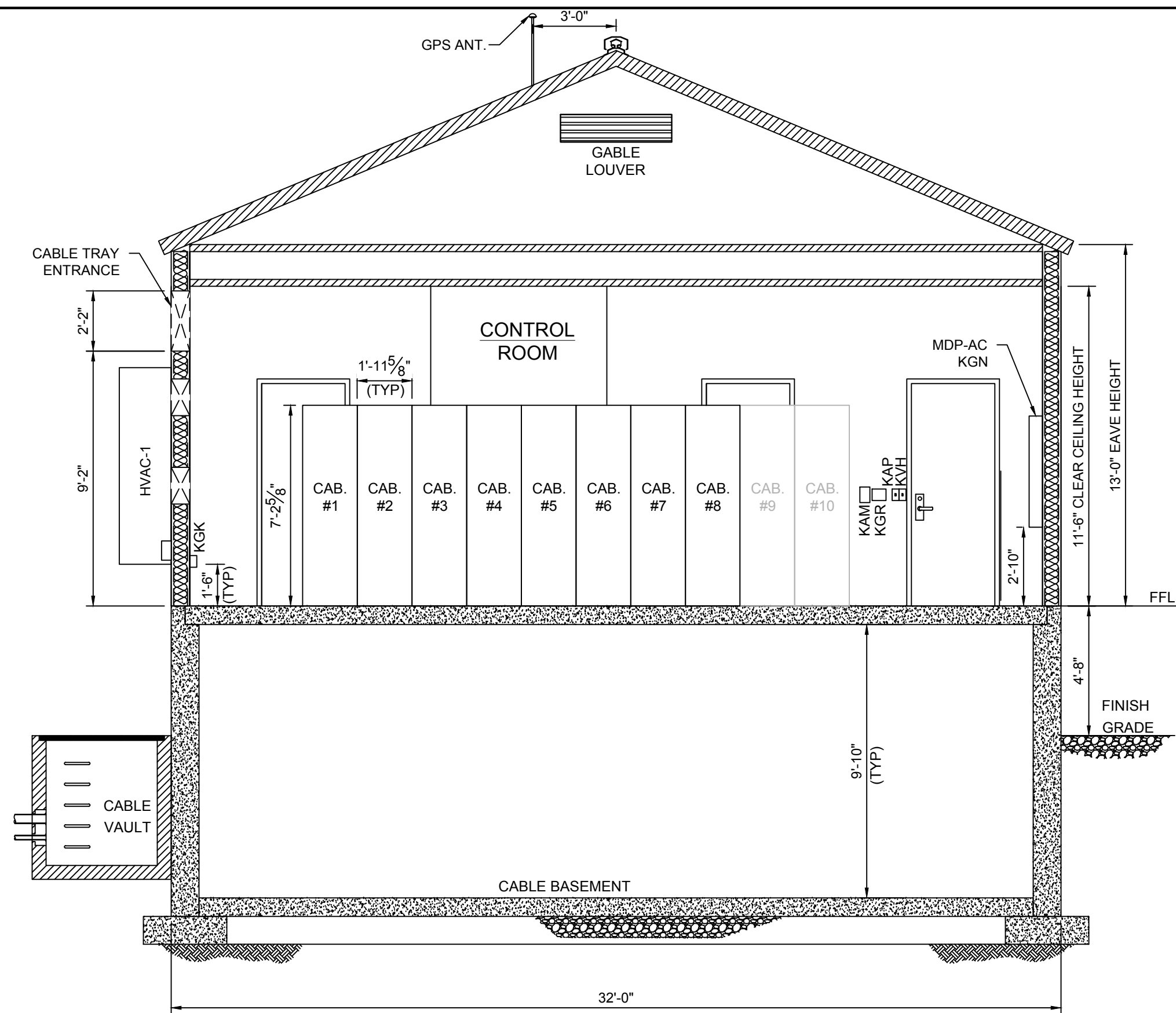
INFO

LOGO

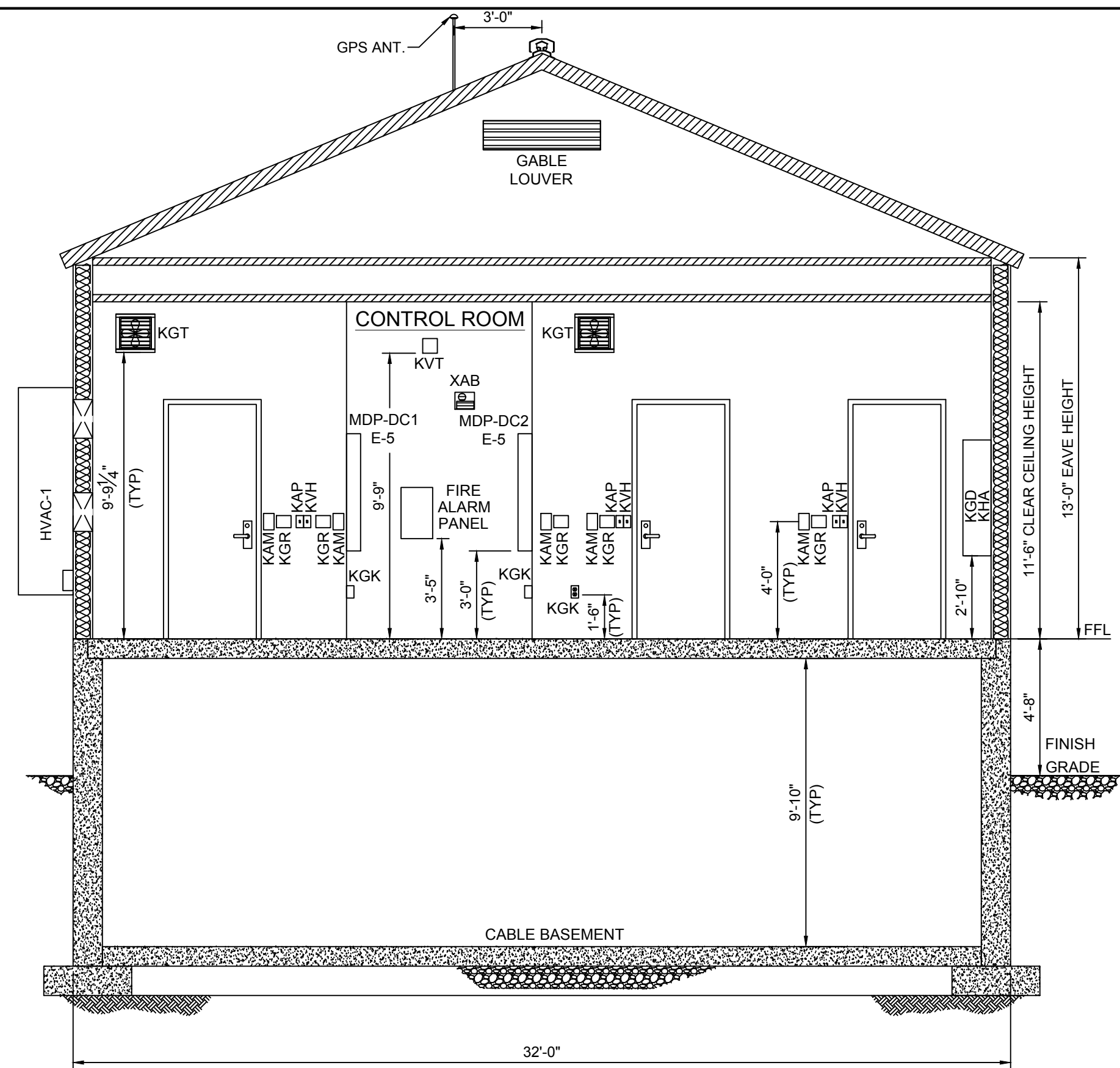
BURNS & MCDONNELL
2 PORTLAND, ME 04101
207.517.4680

BURNS & MCDONNELL

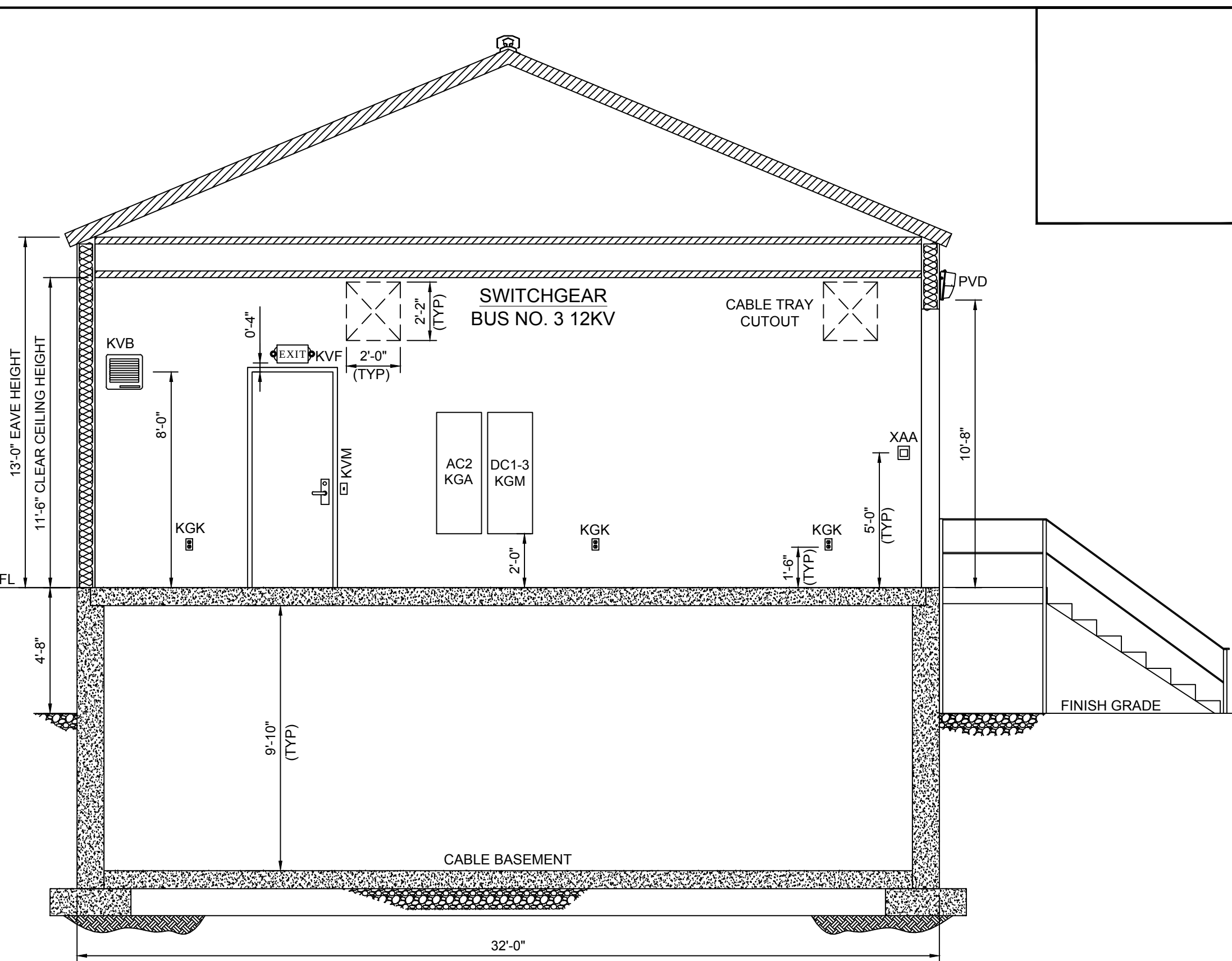
ANSI D 12/17/2019



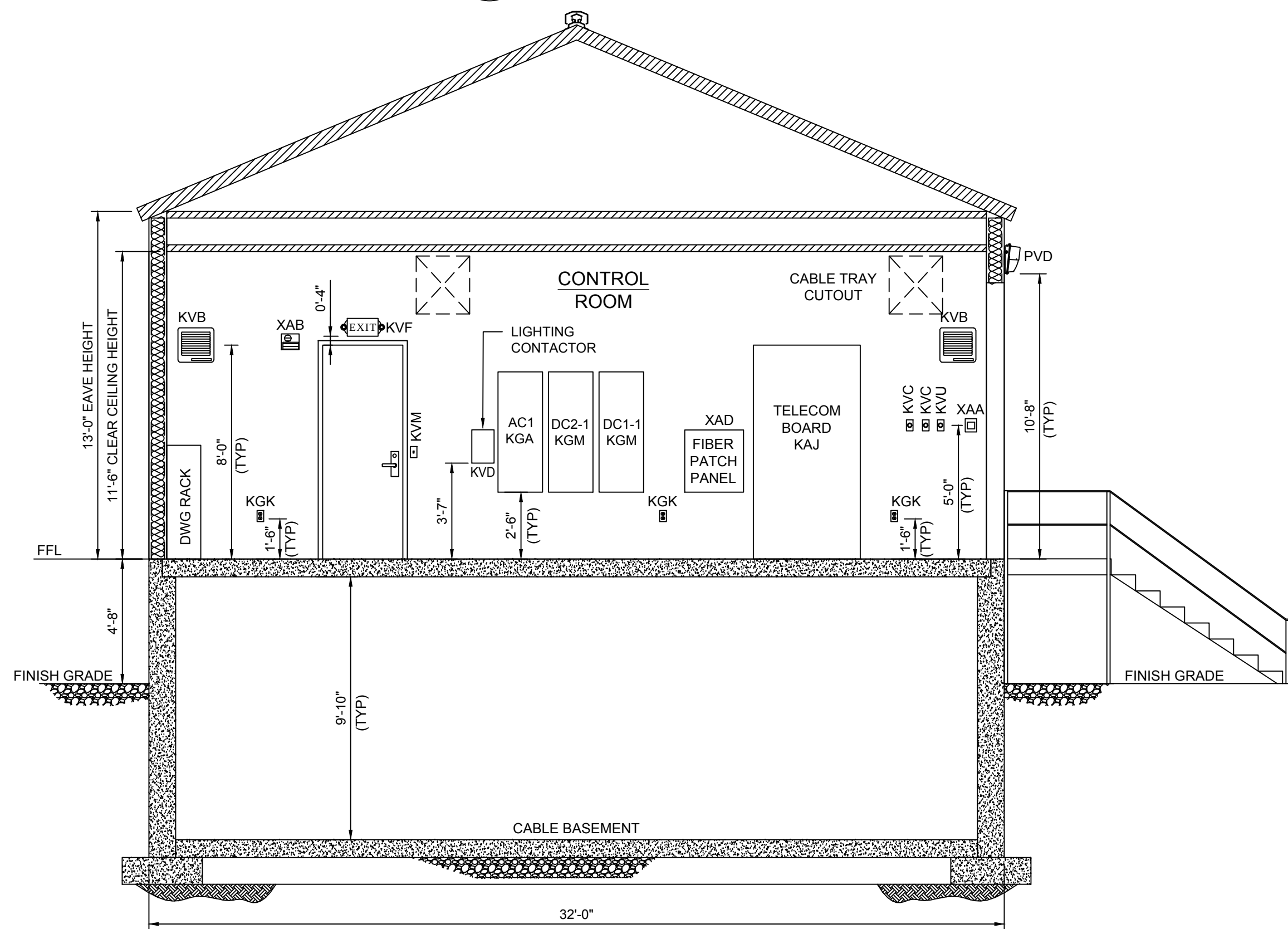
J-J SECTION
548-5-3
SCALE: 1/4" = 1'-0"



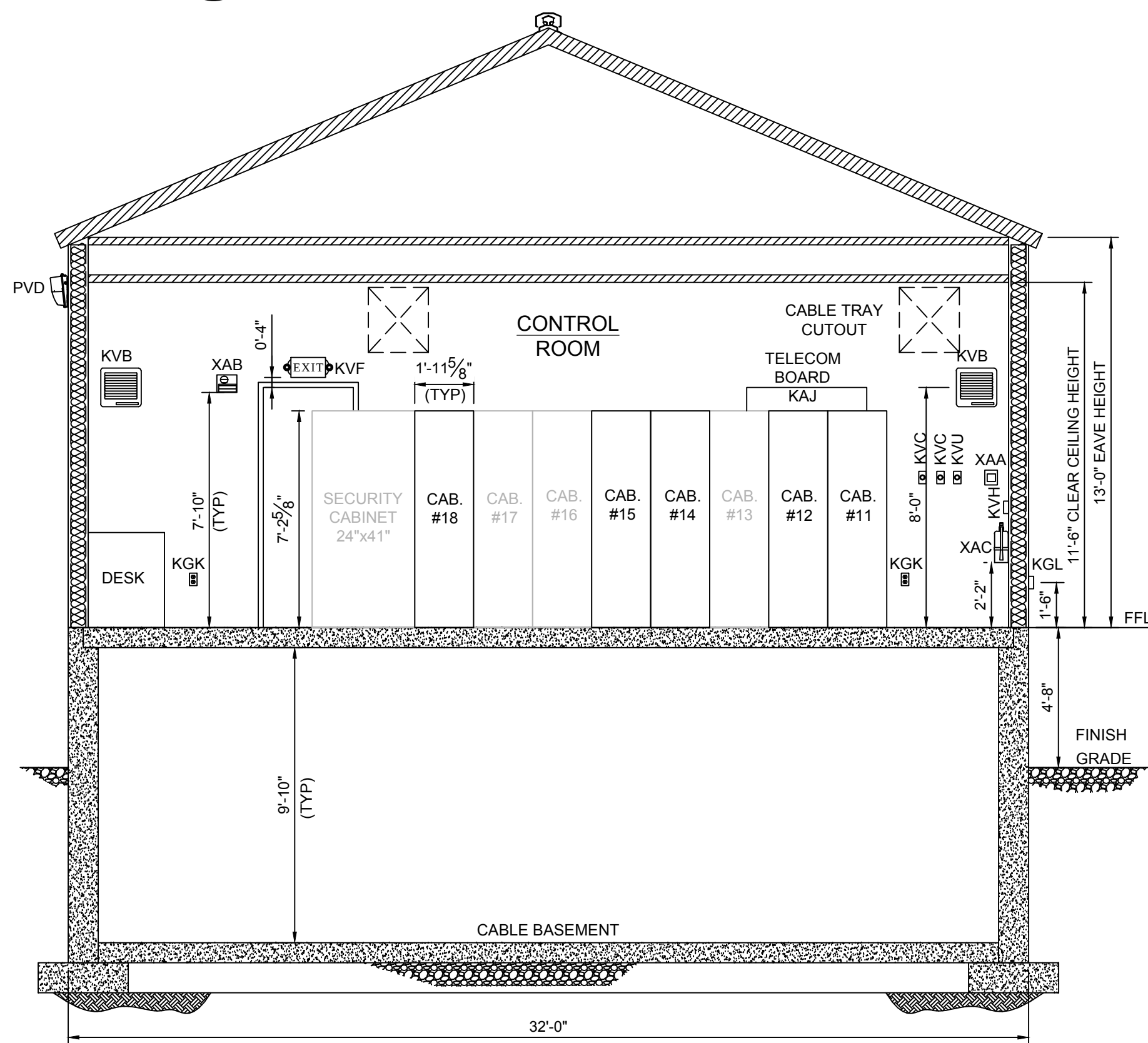
K-K SECTION
548-5-3
SCALE: 1/4" = 1'-0"



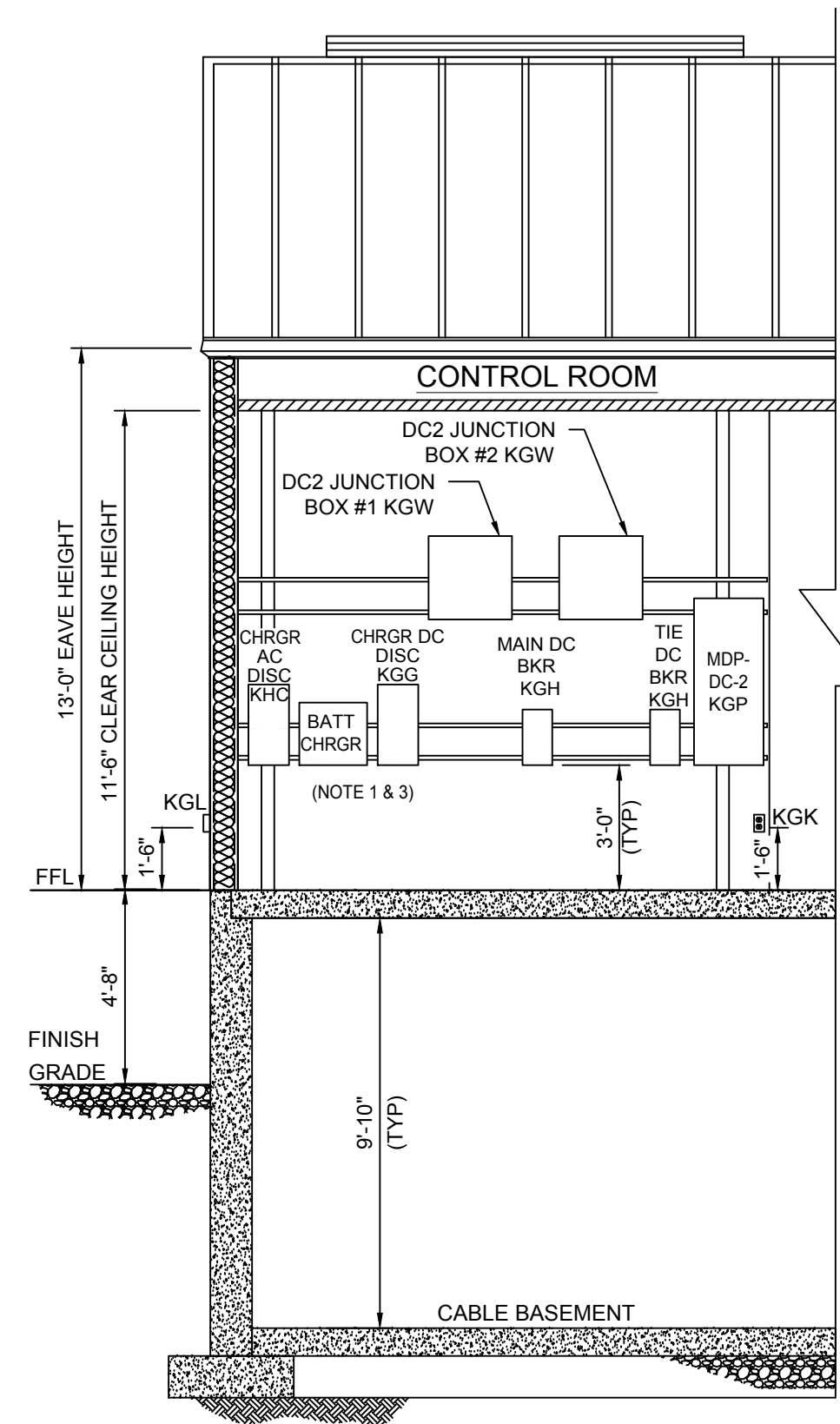
L-L SECTION
548-5-3
SCALE: 1/4" = 1'-0"



M-M SECTION
548-5-3
SCALE: 1/4" = 1'-0"



N-N SECTION
548-5-3
SCALE: 1/4" = 1'-0"



P-P SECTION
548-5-3
SCALE: 1/4" = 1'-0"

NOTES:

- ELECTRICAL EQUIPMENT SHOWN LOCATED ON THE BUILDING INTERIOR WALL SHALL BE MOUNTED ON STEEL UNISTRUT AND ATTACHED TO THE BUILDING STRUCTURE AND SUPPORTED FROM THE CONCRETE FLOOR. CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND INDUSTRY PRACTICE.
- REFER TO DRAWING 548-5-5 SH 2 FOR TYPICAL DETAIL OF WALL MOUNTED EQUIPMENT.

REFERENCE DRAWINGS:

548-5-3 CONTROL HOUSE PLAN 34.5KV & 12KV SWITCHGEAR
548-12-2 YARD ERECTION MATERIAL LIST (ABOVE GROUND)
548-12-3 CONTROL HOUSE ERECTION MATERIAL LIST



PE STAMP		AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID				 CMP AVANGRID		CONTROL HOUSE SECTION J-J, K-K, L-L, M-M, N-N & P-P SH 3 OF 3			
						FOREST AVE S/S		PORTLAND, ME			
						BY GMB/MC		SCALE: 1/4" = 1'-0"		FILE: 548-0005-004 SH 003.dwg	
						CK S/B/MC		NO.		REV	
						APP S/B/MC		548-0005-004 SH 003		0-0C	
REV		DESCRIPTION		DATE	BY	CK	APP	DATE 11/17/2019			

CODE COMPLIANCE

2015 INTERNATIONAL BUILDING CODE
2015 MAINE UNIFORM BUILDING & ENERGY CODE
2009 INTERNATIONAL ENERGY CONSERVATION CODE
2017 NATIONAL ELECTRICAL CODE WITH AMENDMENTS
ACCESSIBILITY EXEMPT PER IBC SECTION 1103.2.4

GENERAL INFORMATION

MODEL NUMBER: 2017000575
DIMENSIONS: 32'-0" (W) X 92'-0" (L) X 13'-0" (H)
STORIES: 1
OCCUPANT LOAD: 1
OCCUPANCY CLASSIFICATION: U
BUILDING AREA SQUARE FOOTAGE: 2816

BASIC DESIGN CRITERIA

BUILDING TYPE: FR - FRAMED GABLE
ROOF SLOPE: 22.6 DEGREES.
MEAN ROOF HEIGHT: 16'-4"
BUILDING LOCATION: MAINE
CONSTRUCTION TYPE: IIB
BUILDING CONTAINS: EQUIPMENT (NOT FOR HUMAN OCCUPANCY)

LOADS

SNOW LOADING:
GROUND SNOW LOAD: 100 PSF.
FLAT-ROOF SNOW LOAD: 92.4 PSF.
IMPORTANCE FACTOR: 1.2
EXPOSURE FACTOR: 1
THERMAL FACTOR: 1.1
SLOPE FACTOR: 1

WIND LOADING:
WIND SPEED: 150 MPH. (Vult)
117 MPH. (Vasd)
EXPOSURE: C
Kd: 0.85
Kz: 0.85
KZT: 1
G: 0.85
Q: 31.6 PSF.
BUILDING IS 'ENCLOSED'.
INTERNAL PRESSURE COEFFICIENT: 0.18

SEISMIC DATA

SEISMIC LOADING:
SITE (SOIL) CLASSIFICATION: "D"
SPECTRAL RESPONSE ACCELERATION (0.2S): 38.4%
SPECTRAL RESPONSE ACCELERATION (1.0S): 10.42%
IMPORTANCE FACTOR: 1.5

BASIC SEISMIC-FORCE-RESISTING SYSTEM:
LIGHT FRAME WALLS WITH SHEAR PANELS-SHEET STEEL PANELS.
RESPONSE MODIFICATION FACTOR: 6.5
SYSTEM OVERSTRENGTH FACTOR: 3
DEFLECTION AMPLIFICATION FACTOR: 4
MAXIMUM ALLOWABLE BUILDING HEIGHT: 65 FEET
SEISMIC DESIGN CATEGORY: D
SHORT PERIOD SPECTRAL RESPONSE COEFFICIENT: 38.2
LONG PERIOD SPECTRAL RESPONSE COEFFICIENT: 16.53
SEISMIC ANALYSIS PROCEDURE: SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE.
DESIGN BASE SHEAR: 13,005 POUNDS.

OTHER LOADINGS AND DATA:

RISK CATEGORY: "IV"
ROOF LIVE LOAD: 20 PSF.
AUXILLARY HUNG LOAD ON INTERIOR OF EXTERIOR WALL PANELS: 50 PLF.
DISTANCE FROM OUTSIDE FACE OF WALL PANEL TO CENTER OF LOAD: 24 INCHES.
COLLATERAL LOAD: 25 PSF.
CONCENTRATED ROOF LOAD: 200 LBS.
ROOF SYSTEM DEAD LOAD SHALL BE LESS THAN 20 PSF.
WALL SYSTEM DEAD LOAD SHALL BE LESS THAN 20 PSF.
ALLOWABLE ROOF PANEL DEFLECTION: L/240
ALLOWABLE WALL PANEL DEFLECTION: L/240
WALL PANEL THICKNESS: 0.028", ASTM A 653, G90, SQ 50 GRADE 1.
ROOF PANEL THICKNESS: 0.025", ASTM A 792, AZ55, GRADE 50A

NOTES:

- THIS UNIT IS APPROVED FOR PLACEMENT IN **MAINE** ONLY WHEN (1) THE BUILDING OFFICIAL HAS DETERMINED THAT PLUMBING FIXTURES ARE TO BE INSTALLED AT THE SITE, OR (2) THE PROVISIONS OF SECTION 2902 OF THE IBC ARE OTHERWISE MET, OR (3) A VARIANCE FROM THE PROVISIONS OF SECTION 2902 OF THE IBC HAS BEEN GRANTED BY THE APPROPRIATE AGENCY.
- THIS BUILDING SHALL NOT BE INSTALLED IN LOCATIONS WITH HIGHER LOADS THAN DESIGN LOADS SPECIFIED IN THIS PACKAGE.
- THIS BUILDING IS NOT DESIGNED TO BE LOCATED IN A FLOOD HAZARD AREA.
- THIS BUILDING DOES NOT HAVE AN ATTIC AS DEFINED IN IBC SECTION 1203.2 AND DOES NOT HAVE VENTILATION IN THE INSULATED AREA BETWEEN THE CEILING AND ROOF.
- THIS BUILDING IS NOT OFFERED TO THE GENERAL PUBLIC.
- THIS BUILDING IS CUSTOM MANUFACTURED TO EXACT CUSTOMER REQUIREMENTS.
- SIZE, QUANTITY, AND LOCATION OF ACCESSORIES IS SUBJECT TO CHANGE AT CUSTOMER REQUEST AND IS SUBJECT TO INSPECTION & APPROVAL BY THE JURISDICTION HAVING AUTHORITY.
- THIS BUILDING HAS BEEN DESIGNED TO BE ATTACHED TO A PERMANENT FOUNDATION.
- NO ELECTRICAL WIRING IS SUPPLIED BY PARKLINE, INC. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED BY OTHERS AFTER DELIVERY OF THE BUILDING TO ITS FINAL DESTINATION PER THE NEC, AND IS SUBJECT TO INSPECTION BY LOCAL JURISDICTION.
- NO PLUMBING IS SUPPLIED BY PARKLINE, INC. ALL PLUMBING IS TO BE SITE INSTALLED BY OTHERS, AND IS SUBJECT TO INSPECTION BY LOCAL JURISDICTION.
- THIS BUILDING DOES NOT CONTAIN A SPRINKLER SYSTEM.
- PIPE PENETRATIONS ARE SUBJECT TO SITE INSPECTION AND APPROVAL BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- ANY PENETRATIONS THROUGH A FIRE RATED ASSEMBLY SHALL BE DONE ON SITE BY OTHERS IN ACCORDANCE WITH THE PROPER SECTION OF THE BUILDING CODE OF NEW YORK STATE .
- ANY CHEMICALS TO BE STORED IN THIS BUILDING SHALL NOT EXCEED AMOUNTS LISTED IN TABLES 307.1(1) AND 307.1(2) OF THE IBC.
- DRAWINGS BEARING THE DRAWING NUMBER PREFIX "2017000575" ARE SPECIFIC TO THIS MODEL. ALL OTHER DRAWINGS ARE GENERIC AND DEPICT NORMAL CONSTRUCTION PRACTICES FOR THE VARIOUS OPTIONS SHOWN. ONLY THE OPTIONS SPECIFICALLY REFERENCED IN THE MODEL SPECIFIC DRAWINGS APPLY TO THIS MODEL.
- COMPASS ROSE DIRECTIONS ('A', 'B', 'C', & 'D') DO NOT CORRESPOND TO MAP COMPASS DIRECTIONS UNLESS EXPLICITLY INDICATED.
- STEEL DESIGN, FABRICATION AND CONSTRUCTION SHALL COMPLY WITH AISC 360 AND AISI S100 AND S200.

DRAWING LIST

QTY	NUMBER	DESCRIPTION
1	2017000575-ME	MAINE COVER SHEET
1	2017000575-1	FLOOR PLAN
1	2017000575-2	ROOF FRAMING
1	2017000575-2A	ROOF PLAN
1	2017000575-3	BASE CHANNEL LAYOUT
1	2017000575-4	ELEVATIONS
1	2017000575-4A	INTERIOR ELEVATIONS
1	2017000575-4B	WIND STORM DOOR DETAILS
1	2017000575-6	CABLE TRAY LAYOUT
1	ASK-2	STIFFENING COLUMN DETAILS
1	AT-2	AIR TIGHT BUILDING W/ THERMAX DETAILS
1	BASE-D-M	BASE CHANNEL CORNER CLIP DETAIL
1	BASE-HD-M	TITEN ANCHOR INSTALLATION DETAIL
1	BOX-AL-2	BOX STYLE TRIM SYSTEM FOR TYPE 'AL' BUILDINGS
1	BOX-AL-3	BOX STYLE TRIM SYSTEM FOR TYPE 'AL' BUILDINGS
1	CEIL-AL-3	DROPPED HEIGHT CEILING DETAILS
1	CEIL-AL-STIF	CEILING REINFORCEMENT DETAILS
1	CEIL-R49	R49 CEILING INSULATION DETAILS
1	CSK-2	CORNER STIFFENING COLUMN DETAILS
1	FAN-12XP-1	12" WALL MOUNTED EXHAUST FAN DETAILS
1	FAST-D-1	FASTENER IDENTIFICATION
1	FLT-1	FORMED WALL LINER W/ RIDGID BOARD DETAILS
1	FLT-2	FORMED WALL LINER W/ RIDGID BOARD DETAILS
1	FO-2A	FRAMED OPENING WITHOUT HEAD PANELS
1	FO-2B	FRAMED OPENING WITHOUT HEAD PANELS
1	HM-CEIL	1 AND 2 HOUR FIRE CEILING DETAILS
1	HM-FAN-2	SLEEVED FAN AND DAMPER IN 2 HOUR WALL
1	HM-FLT-2HR	2 HOUR FIRE FLT DETAILS
1	HM-FLT-FIRE	1 AND 2 HR FIRE RATED WALL SYSTEM W/ RIDGID BOARD
1	HM-HVAC-2	INSTALLATION FOR WALL MOUNTED "BARD" UNIT IN 2HR FIRE WALL
1	LVR-A	ADJUSTABLE WALL LOUVER DETAILS
1	LVR-AC-MO	WALL LOUVER WITH AC MOTOR OPERATOR INSTALLATION
1	LVR-G	FIXED BLADE GABLE LOUVER DETAILS
1	PARTITION-1	METAL PARTITION SYSTEM DETAILS
1	RIDGEVENT-AL	RIDGE VENT INSTALLATION FOR TYPE 'AL' BUILDINGS
1	STIF-HL	HIGH / LOW RIB STIFFENER INSTALLATION
1	STIF-RIB	RIB STIFFENER INSTALLATION
1	SWP-1	SPECIAL WIDTH WALL PANEL DETAILS
1	WALL-1	PANEL CLOSURE AND STITCH SCREW DETAILS
1	WD3-CLOS	DOOR CLOSER DETAILS
1	WD3-DBL	DOUBLE LEAF WALK DOOR
1	WD3-FOOT	DOOR FOOT BOLT DETAILS
1	WD3-PIVOT	DOOR REINFORCEMENT PIVOT DETAILS
1	WD3-SGL	SINGLE LEAF WALK DOOR
1	WD3-THRSHD	WALK DOOR THRESHOLD DETAILS
1	WD3-WS	WALK DOOR WEATHER STRIPPING DETAILS
1	WD30-HV	3'-0" WALK DOOR HIGH VELOCITY WIND
1	WD60-HV10	6'-0" WALK DOOR HIGH VELOCITY WIND
1	WOK	BASIC WALL OPENING KIT DETAILS
1	WOK-FIL-2	WALL OPENING WITH REINFORCED FILLERS
1	WOK-HVAC	HVAC WALL OPENING KIT DETAILS

MODEL NUMBER: 2017000575

REVISIONS	BY
11-20-17	MRW
04-23-18	JMC
9-25-18	TLC
01-03-19	RSR

BUILDING FINISH

WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"



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PARKLINE, INC.
328 INDUSTRIAL PARK DRIVE
ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855 FAX: 304-586-3842

CENTRAL MAINE POWER COMPANY
NEW GLOUCESTER, ME

REF: FOREST AVENUE GIS BUILDING
PO#: 4504058564
DESTINATION: PORTLAND, ME.

MAINE COVER SHEET

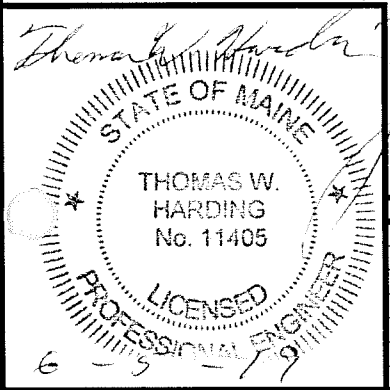
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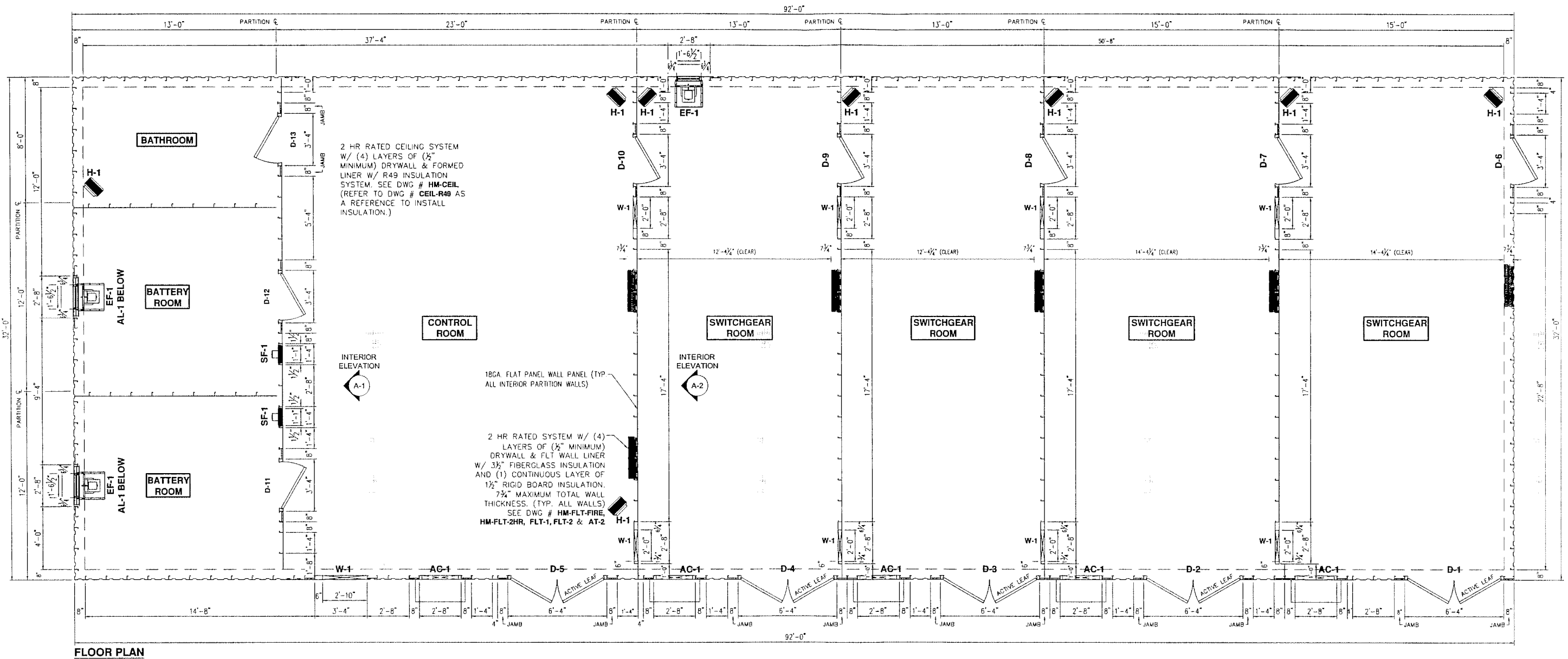
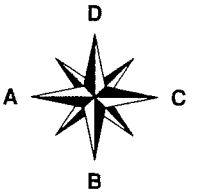
DRAWN BY: MRW

SCALE: NTS

2017000575-ME

ORDER #: 2017000575 REVISION #: 4





FLOOR PLAN

REVISIONS	BY
04-23-18	JMC
09-25-18	TLC
11-29-18	TLC
01-03-19	RSR
04-02-19	ABH
04-17-19	ABH
05-29-19	ABH

BUILDING FINISH

WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"



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CENTRAL MAINE POWER COMPANY
NEW GLOUCESTER, ME

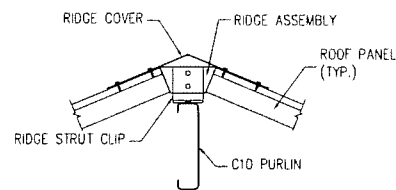
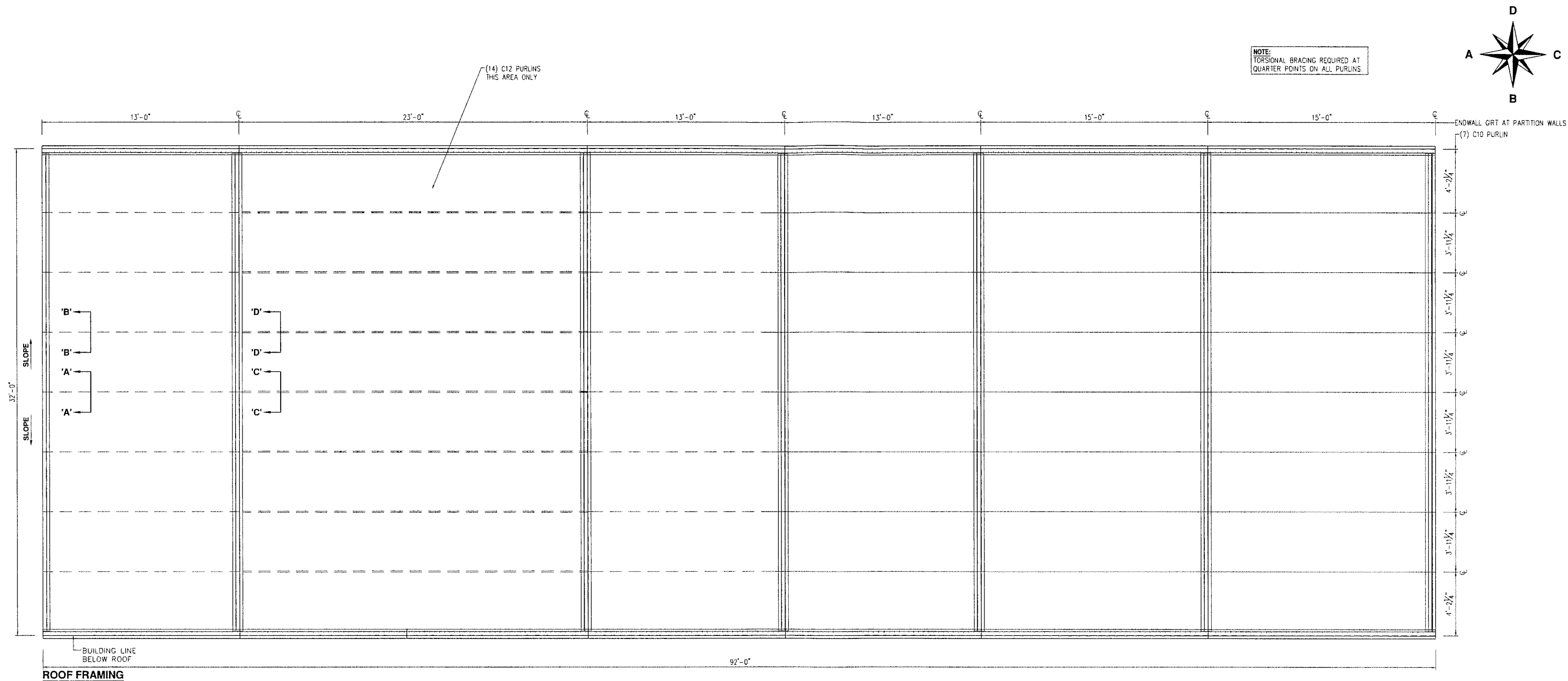
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PO#: 4504058564
DESTINATION: PORTLAND, ME.

FLOOR PLAN

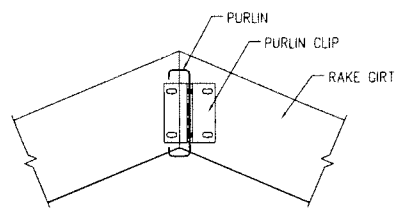
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SCALE: NTS

2017000575-1

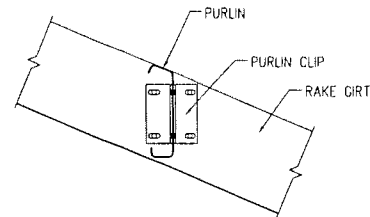
ORDER #: 2017000575 REVISION #: 7



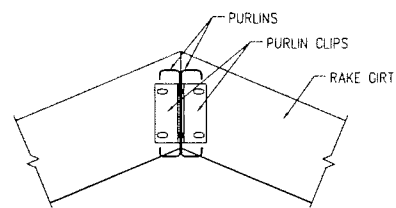
RIDGE CONNECTION
@ RIDGE STRUT CLIP



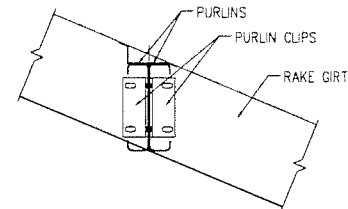
PURLIN CONNECTION 'A' 'A'
@ RIDGE



PURLIN CONNECTION 'B' 'B'
@ RAKE GIRT



PURLIN CONNECTION 'C' 'C'
@ RIDGE



PURLIN CONNECTION 'D' 'D'
@ RAKE GIRT

REVISIONS	BY
04-23-18	JMC
09-25-17	TLC
01-03-19	RSR
04-02-19	ABH

BUILDING FINISH
WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"



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CENTRAL MAINE POWER COMPANY
NEW GLOUCESTER, ME

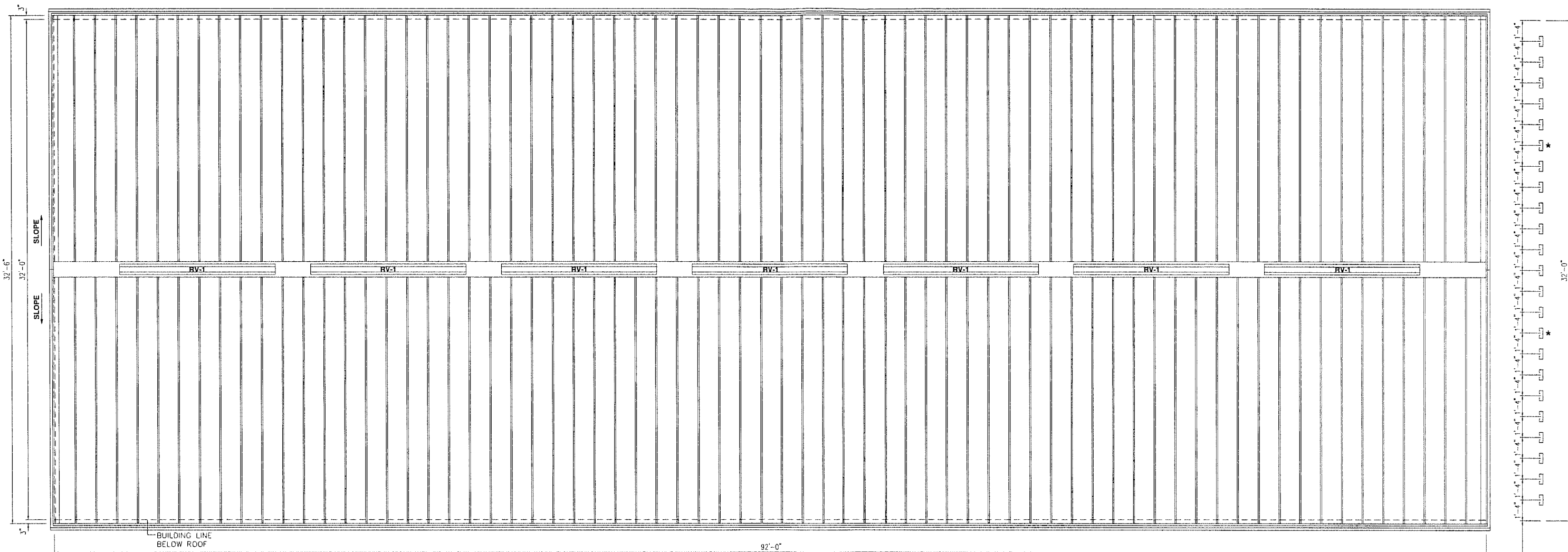
REF: FOREST AVENUE GIS BUILDING
PO#: 4504058564
DESTINATION: PORTLAND, ME.

DATE: 11/9/2017
DRAWN BY: MRW
SCALE: NTS

ROOF FRAMING

2017000575-2

ORDER #: 2017000575 REVISION #: 4



ROOF PLAN

LEGEND:
RV-1 - (7) 10'-0" RIDGE VENTILATOR

NOTE:
6" MINIMUM SPACE BETWEEN
RIDGE VENTS. SEE DWG #
RIDGEVENT-AL

EQUIPMENT SUPPORT LAYOUT

* - OMIT THESE EQUIPMENT
SUPPORTS IN BOTH BATTERY ROOMS.

USE 900 SUPPORTS IN LIEU OF 1095
IN THE CONTROL ROOM.

(23) 1095/900 EQUIPMENT
SUPPORTS FOR LIGHTS
AND CABLE TRAY

REVISIONS	BY
04-23-18	JMC
09-25-18	TLC
01-03-19	RSR
04-02-19	ABH

BUILDING FINISH
WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"

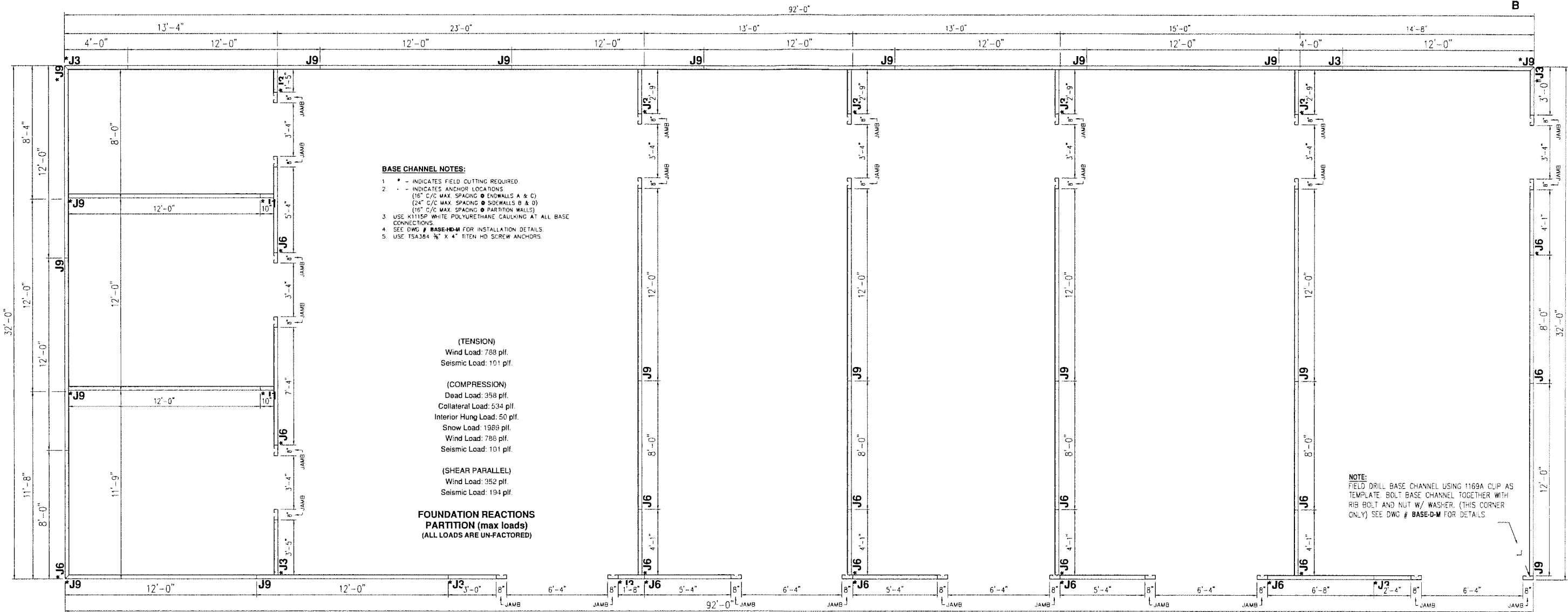


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CENTRAL MAINE POWER COMPANY NEW GLOUCESTER, ME
REF: FOREST AVENUE GIS BUILDING PO#: 4504058564 DESTINATION: PORTLAND, ME.

ROOF PLAN			
DATE:	11/9/2017	2017000575-2A	
DRAWN BY:	MRW		
SCALE:	NTS	ORDER #:	2017000575
		REVISION #:	34



Endwalls 'A' and 'C'

- Wind Load: 406 plf.
- Seismic Load: 35 plf. (TENSION)
- Wind Suction Load: 473 plf. (SHEAR NORMAL)
- Dead Load: 126 plf.
- Collateral Load: 188 plf.
- Interior Hung Load: 50 plf.
- Snow Load: 689 plf.
- Seismic Load: 35 plf. (COMPRESSION)

Foundation Reactions

Endwalls 'A' and 'C'

(ALL LOADS ARE UN-FACTORED)

Sidewalls 'B' and 'D'

- Wind Load: 139 plf.
- Seismic Load: 85.4 plf. (TENSION)
- Wind Suction Load: 314 plf. (SHEAR NORMAL)
- Dead Load: 36 plf.
- Collateral Load: 57 plf.
- Interior Hung Load: 50 plf.
- Snow Load: 201 plf.
- Seismic Load: 85.4 plf. (COMPRESSION)

Foundation Reactions

Sidewalls 'B' and 'D'

(ALL LOADS ARE UN-FACTORED)

REVISIONS	BY	BUILDING FINISH
04-23-18	JMC	WALL COLOR: DESERT TAN
09-25-18	TLC	WALL PANEL THICKNESS: .028
01-03-19	RSR	TRIM COLOR: ARCTIC WHITE
04-02-19	ABH	ROOF COLOR: ARCTIC WHITE
05-29-19	ABH	ROOF PANEL THICKNESS: .025
		ROOF RIB HEIGHT: 3"



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CENTRAL MAINE POWER COMPANY
NEW GLOUCESTER, ME

REF: FOREST AVENUE GIS BUILDING
PO#: 4504058564
DESTINATION: PORTLAND, ME.

BASE CHANNEL LAYOUT

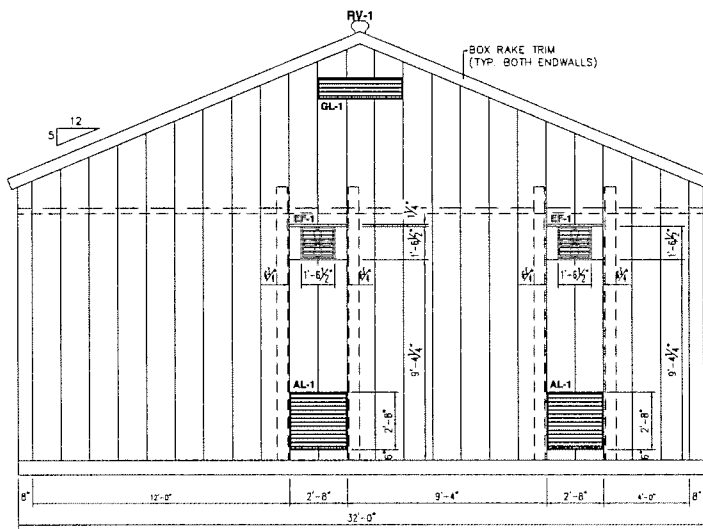
DATE: 11/9/2017

DRAWN BY: MRW

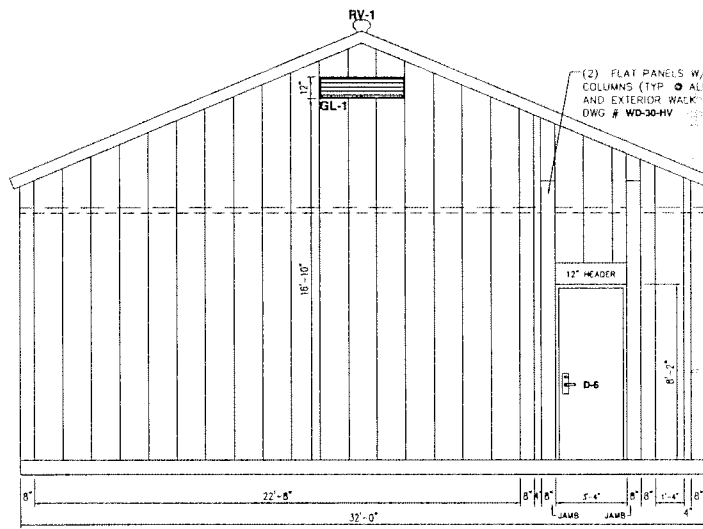
SCALE: NTS

2017000575-3

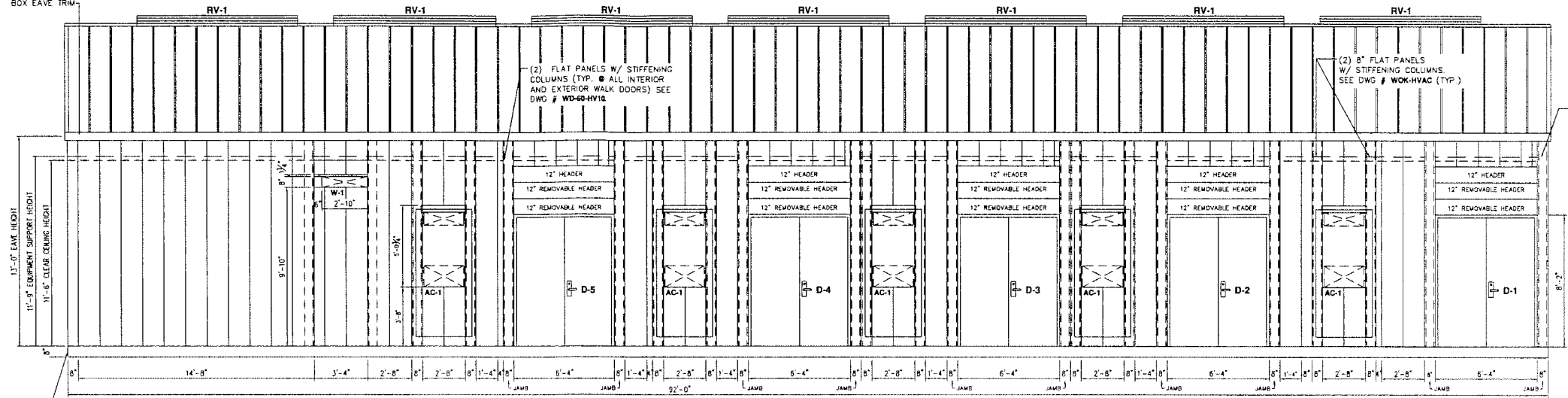
ORDER #:	2017000575	REVISION #:	5
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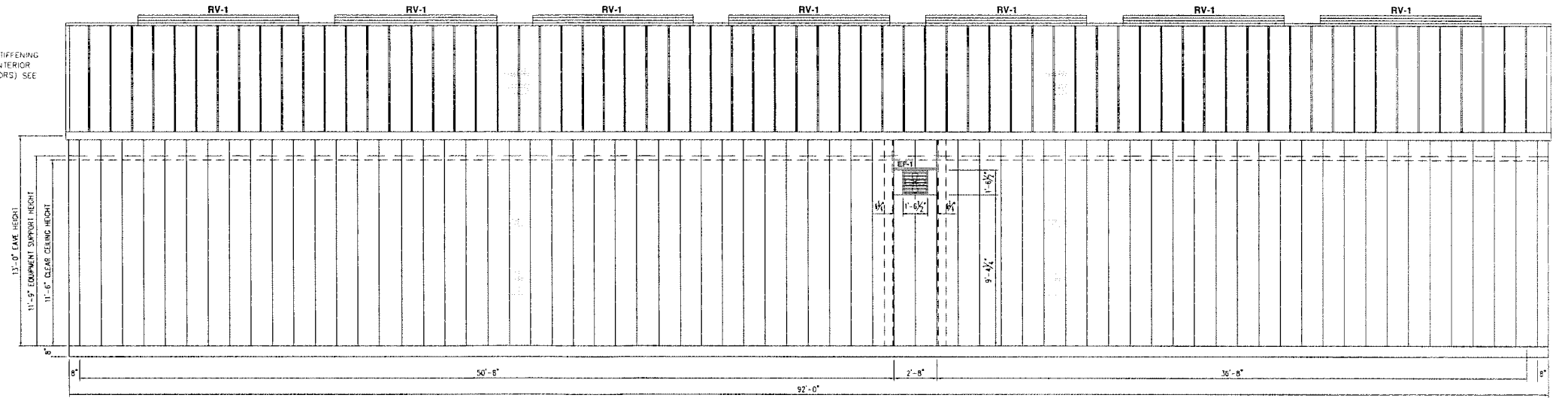
ELEVATION 'A'



ELEVATION 'C'



ELEVATION 'B'



ELEVATION 'D'

LEGEND:

- D-1 - (1) 6'-0" X 8'-0" - WALK DOOR - DSD - WINDSTORM / 1.5 FIRE RATED - W/ (2) 12" REMOVABLE HEADERS - (RIGHT HAND ACTIVE LEAF) - DESERT TAN
D-2 - (1) 6'-0" X 8'-0" - WALK DOOR - DSD - WINDSTORM / 1.5 FIRE RATED - W/ (2) 12" REMOVABLE HEADERS - (RIGHT HAND ACTIVE LEAF) - DESERT TAN
D-3 - (1) 6'-0" X 8'-0" - WALK DOOR - DSD - WINDSTORM / 1.5 FIRE RATED - W/ (2) 12" REMOVABLE HEADERS - (RIGHT HAND ACTIVE LEAF) - DESERT TAN
D-4 - (1) 6'-0" X 8'-0" - WALK DOOR - DSD - WINDSTORM / 1.5 FIRE RATED - W/ (2) 12" REMOVABLE HEADERS - (RIGHT HAND ACTIVE LEAF) - DESERT TAN
D-5 - (1) 6'-0" X 8'-0" - WALK DOOR - DSD - WINDSTORM / 1.5 FIRE RATED - W/ (2) 12" REMOVABLE HEADERS - (RIGHT HAND ACTIVE LEAF) - DESERT TAN
D-6 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - WINDSTORM / 1.5 FIRE RATED - DESERT TAN
D-7 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)
D-8 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)
D-9 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)
D-10 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)
D-11 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)
D-12 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)
D-13 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSD - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR - (NOT SHOWN)

- AC-1 - (5) 5 TON "BARD" WALL MOUNTED HVAC UNIT (MODEL # W6GA2-B09XX4XXJ) 230/208V 3PH, 5.0 TON COOLING / 9KW HEATING W/ SUPPLY AND RETURN GRILLE AND MC4001-B CONTROLLER W/ FIRE DAMPER
W-1 - (1) 3'-4" WALL OPENING KIT / FLASHED BACK TO 34" X 8" FOR CABLE TRAY ENTRY
EF-1 - (3) GSE1-12 EXHAUST FAN (115/60/1, 1/2 HP, DDP MOTOR, 1760 RPM, 2273 CFM @ 125 SP), SLEEVE, GUARD, SHUTTER AND WEATHERHOOD W/ INSECT SCREEN W/ FIRE DAMPER
AL-1 - (2) 2'-8" X 2'-8" ADJUSTABLE LOUVER W/ 120V AC MOTOR ACTUATOR
GL-1 - (2) 4'-0" X 1'-0" CABLE LOUVER
RV-1 - (7) 10'-0" RIDGE VENTILATOR
SF-1 - (2) 1'-4" X 1'-4" - FLASHED BACK TO 13" X 13" FOR GREENHECK SS1-440-D - (NOT SHOWN)
H-1 - (7) MUH074 - 3 PH / 7.5 KW UNIT HEATER - (NOT SHOWN)

NOTES:

1. DUE TO BUILDING DESIGN LOADS, IT WILL BE NECESSARY TO INSTALL (2) RIB STIFFENER AT EACH FULL HEIGHT WALL PANEL RIB. RIB STIFFENERS PROVIDED IN STANDARD LENGTHS. RIB STIFFENER TO BE INSTALLED (1) HIGH AND (1) LOW IN PANEL RIB.
2. ANY FIELD PERFORMED UNISTRUT INSTALLATION FOR CEILING IS NOT BY PARKLINE.

REVISIONS	BY
11-20-17	MRW
04-23-18	JMC
09-25-18	TLC
11-29-18	TLC
01-03-19	RSR
04-02-19	ABH
04-17-19	ABH

BUILDING FINISH

WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"



PARKLINE, INC.
328 INDUSTRIAL PARK DRIVE
ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855 FAX: 304-586-3842

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CENTRAL MAINE POWER COMPANY
NEW GLOUCESTER, ME

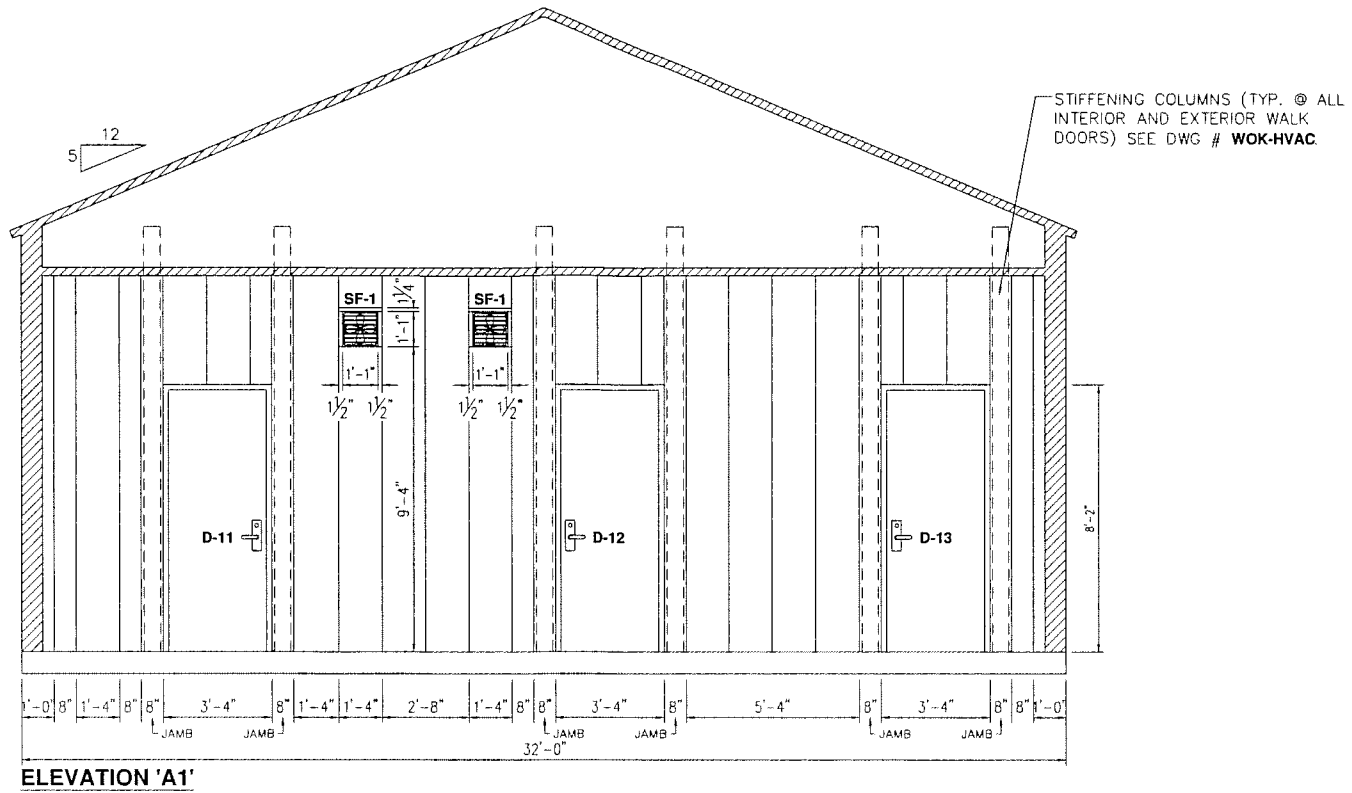
REF: FOREST AVENUE GIS BUILDING
PO#: 4504058564
DESTINATION: PORTLAND, ME.

ELEVATIONS

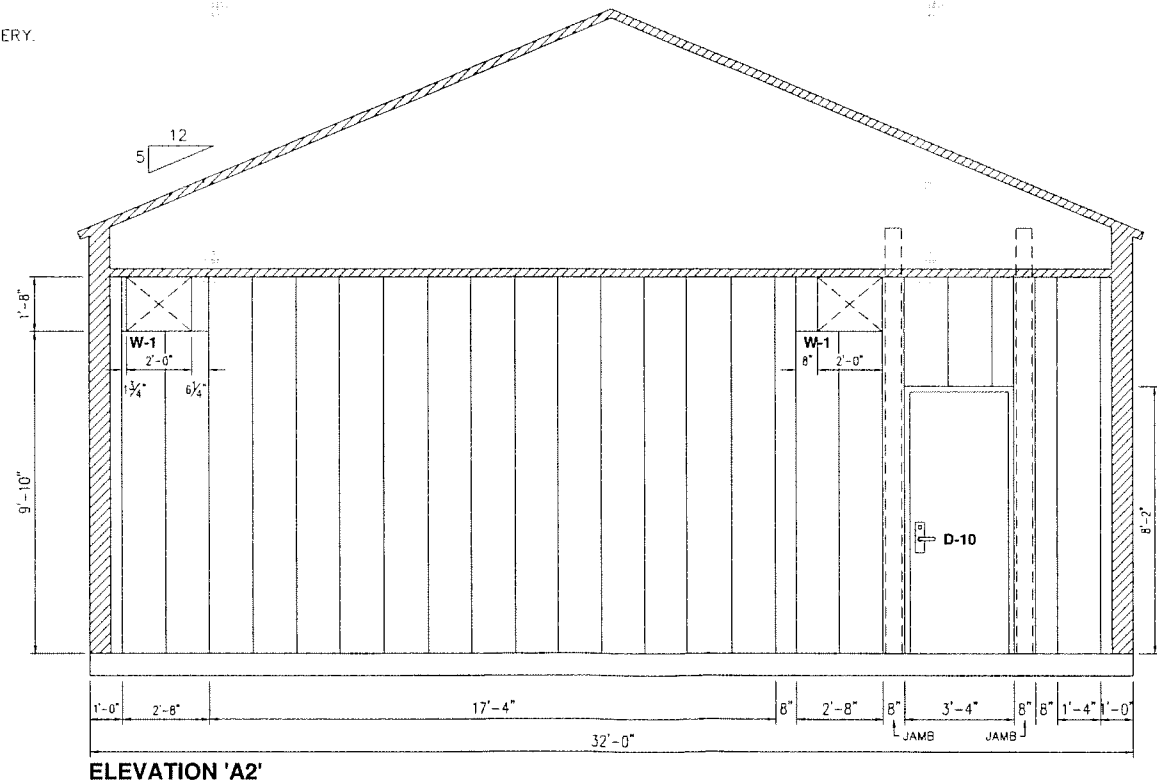
DATE:	11/9/2017
DRAWN BY:	MRW
SCALE:	NTS

2017000575-4

ORDER #:	2017000575	REVISION #:	7
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LEGEND:
D-11 - (1) 3'-0" X 8'-0" - WALK DOOR - LHSO - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR
D-12 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSO - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR
D-13 - (1) 3'-0" X 8'-0" - WALK DOOR - RHSI - 1.5 FIRE RATED - DESERT TAN - INTERIOR DOOR
SF-1 - (2) 1'-4" X 1'-4" - FLASHED BACK TO 13" X 13" FOR GREENHECK SS1-440-D
W-1 - (2) 2'-8" X 1'-8" - WALL OPENING KIT / FLASHED BACK TO 24" X 20" FOR CABLE TRAY ENTRY.



REVISIONS	BY
04-23-18	JMC
11-29-18	TLC
04-17-19	ABH
05-29-19	ABH

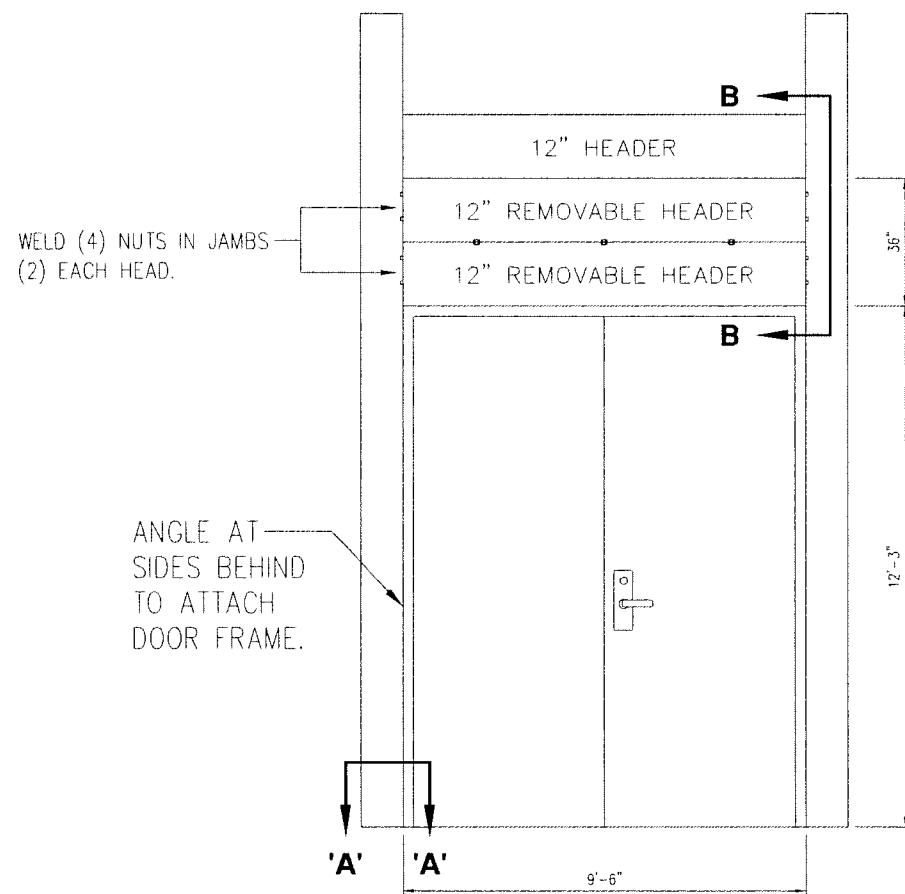
BUILDING FINISH	
WALL COLOR:	DESERT TAN
WALL PANEL THICKNESS:	.028
TRIM COLOR:	ARCTIC WHITE
ROOF COLOR:	ARCTIC WHITE
ROOF PANEL THICKNESS:	.025
ROOF RIB HEIGHT:	3"

PARKLINE, INC.
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ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855 FAX: 304-586-3842

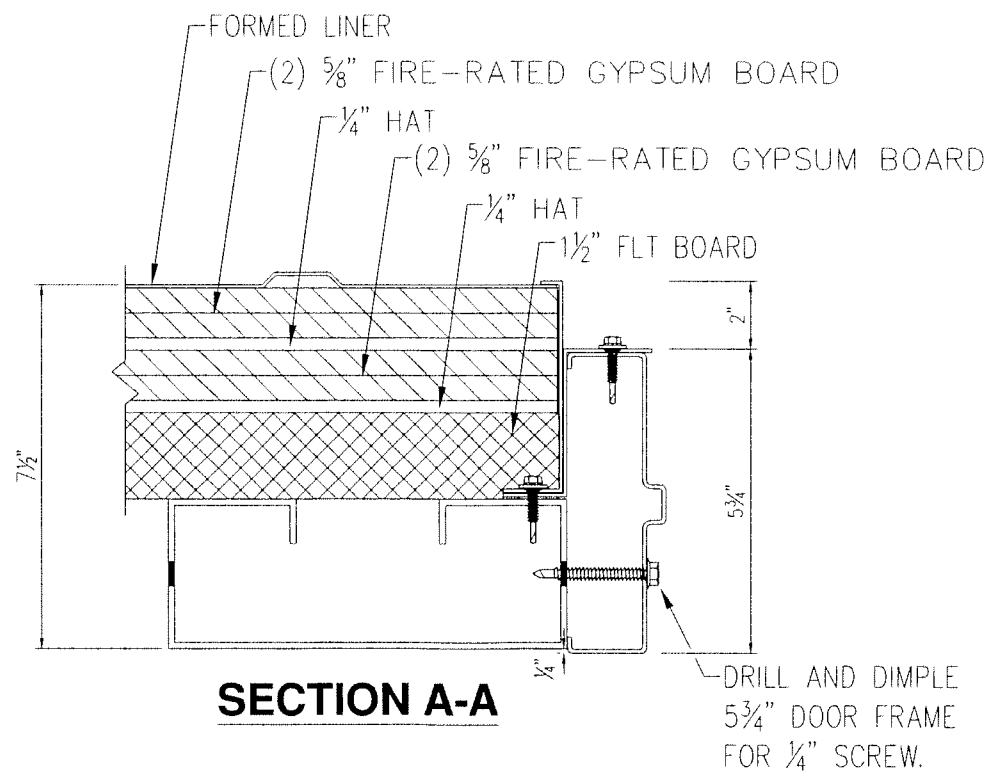
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CENTRAL MAINE POWER COMPANY NEW GLOUCESTER, ME	
REF: FOREST AVENUE GIS BUILDING PO#: 4504058564 DESTINATION: PORTLAND, ME.	

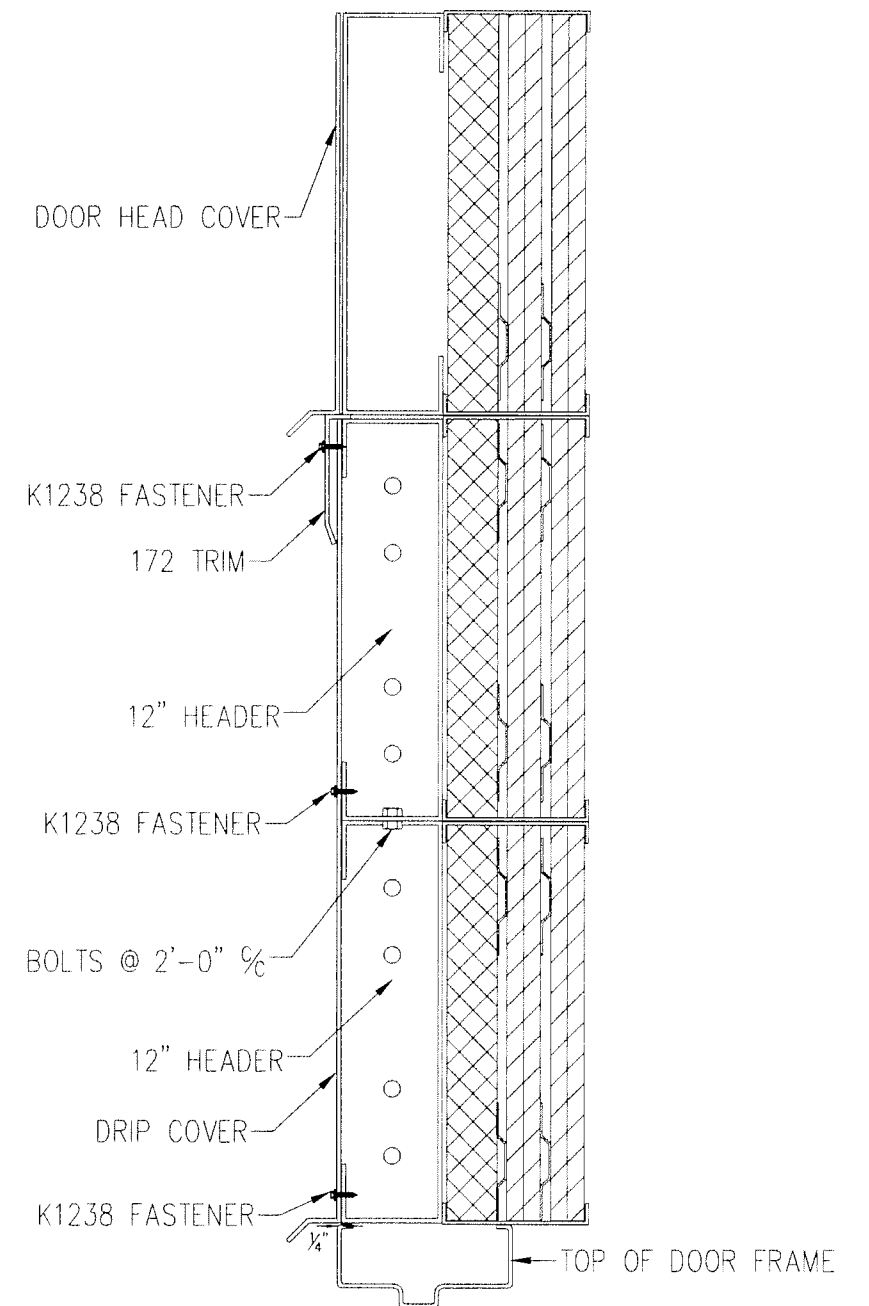
INTERIOR ELEVATIONS			
DATE:	11/9/2017	2017000575-4A	
DRAWN BY:	MRW		
SCALE:	NTS	ORDER #:	2017000575
		REVISION #:	4



**6080 FIRE RATED
WINDSTORM DOOR**



SECTION A-A



SECTION B-B

REVISIONS	BY
05-29-19	ABH

BUILDING FINISH

WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"



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PHONE: 800-786-4855 FAX: 304-586-3842

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CENTRAL MAINE POWER COMPANY
NEW GLOUCESTER, ME

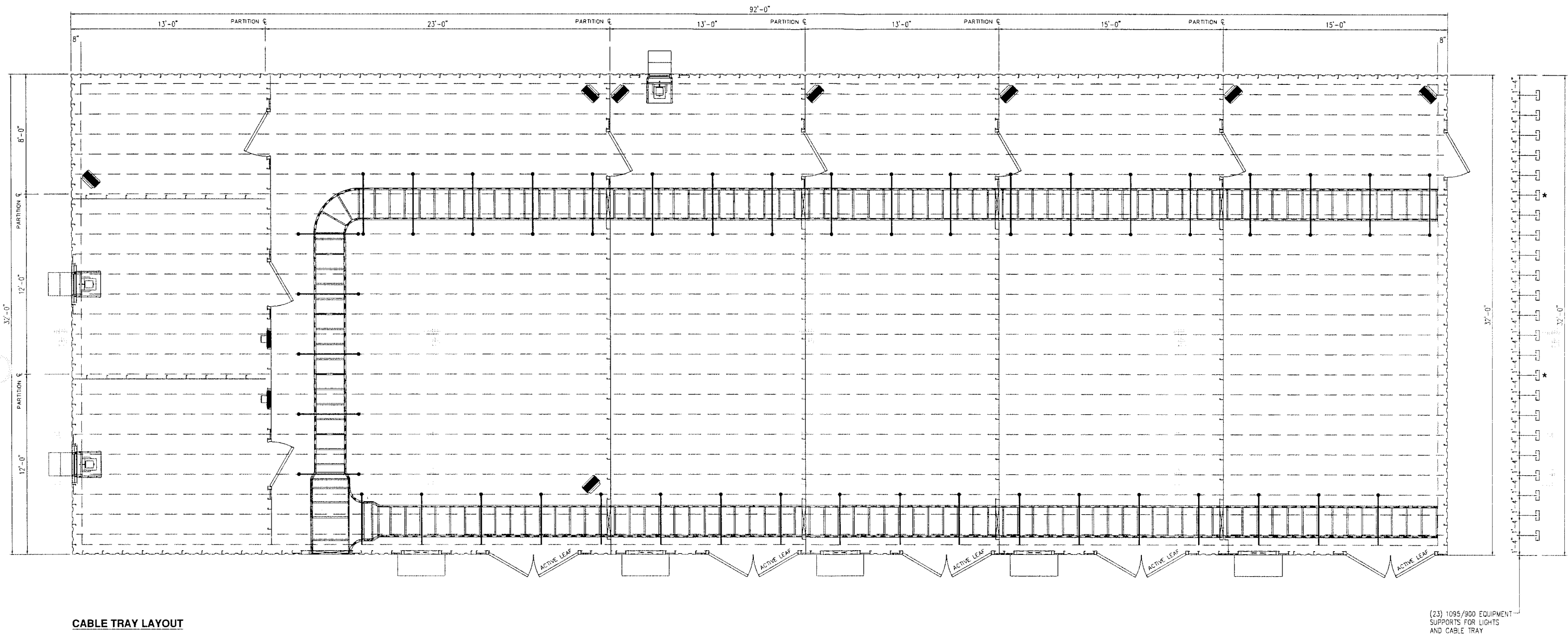
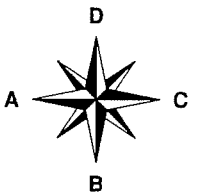
REF: FOREST AVENUE GIS BUILDING
PO#: 4504058564
DESTINATION: PORTLAND, ME.

STORM DOOR DETAILS

DATE: 11/9/2017
DRAWN BY: MRW
SCALE: NTS

2017000575-4B

ORDER #: 2017000575 REVISION #: 1



CABLE TRAY LAYOUT

REVISIONS	BY
05-29-19	ABH

BUILDING FINISH
WALL COLOR: DESERT TAN
WALL PANEL THICKNESS: .028
TRIM COLOR: ARCTIC WHITE
ROOF COLOR: ARCTIC WHITE
ROOF PANEL THICKNESS: .025
ROOF RIB HEIGHT: 3"

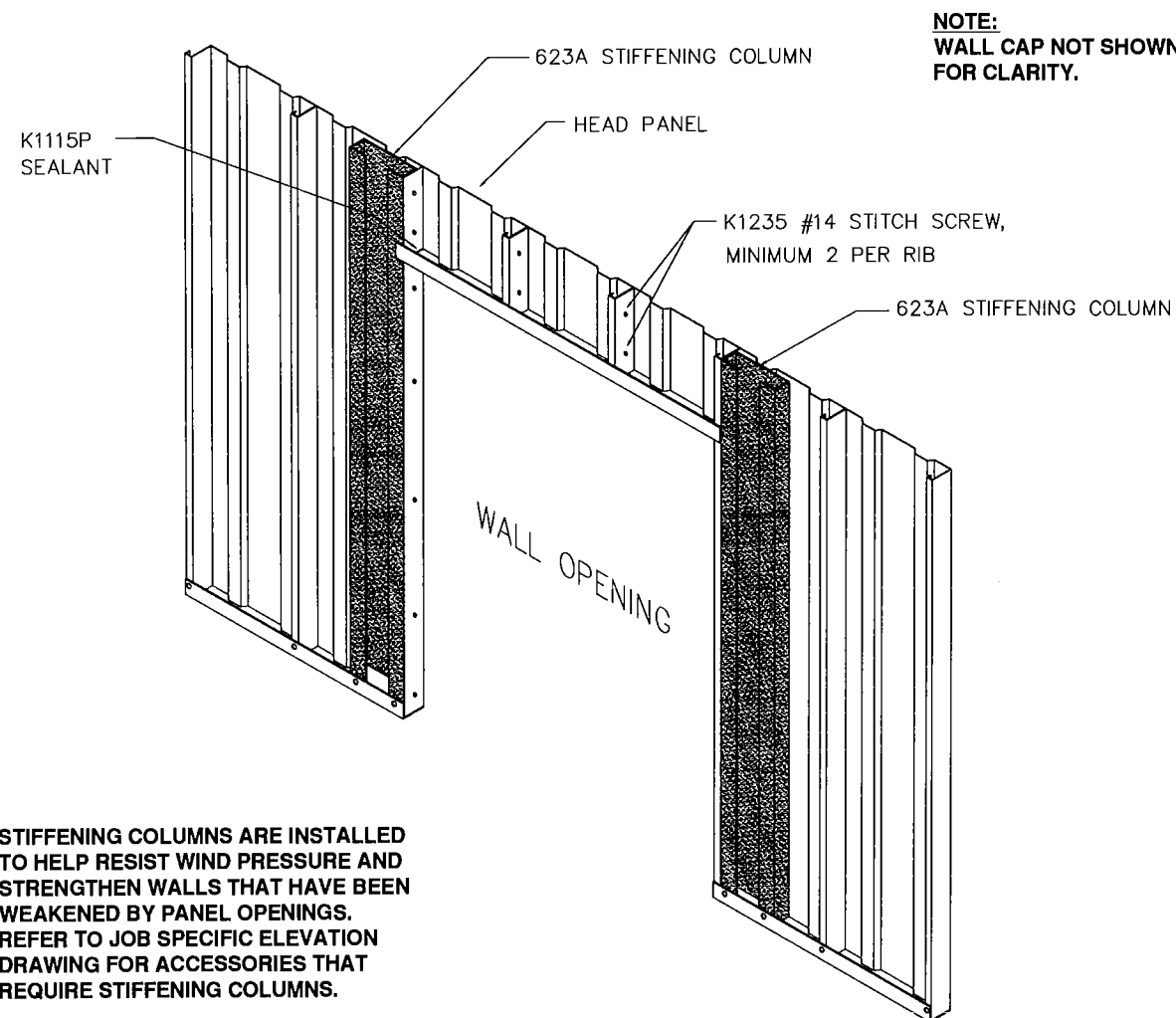


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PHONE: 800-786-4855 FAX: 304-586-3842

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CENTRAL MAINE POWER COMPANY NEW GLOUCESTER, ME
REF: FOREST AVENUE GIS BUILDING PO#: 4504058564 DESTINATION: PORTLAND, ME.

CABLE TRAY LAYOUT			
DATE: 11/9/2017	2017000575-6		
DRAWN BY: MRW			
SCALE: NTS	ORDER #: 2017000575	REVISION #:	1

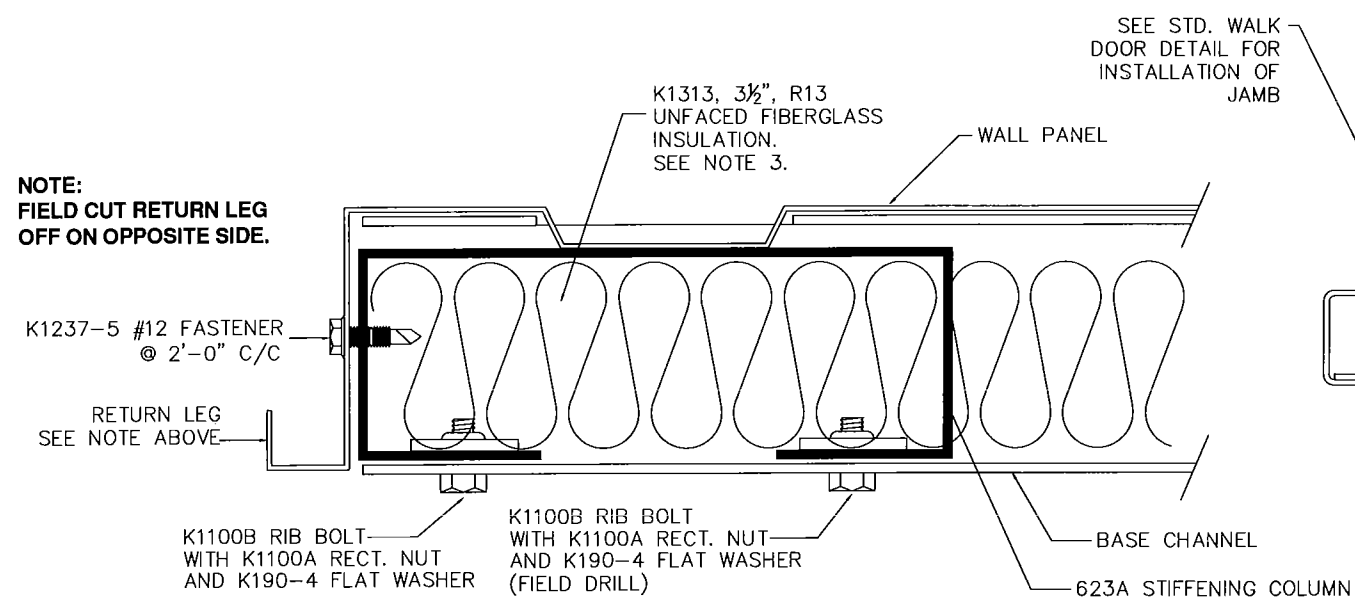


ASSEMBLY PROCEDURE

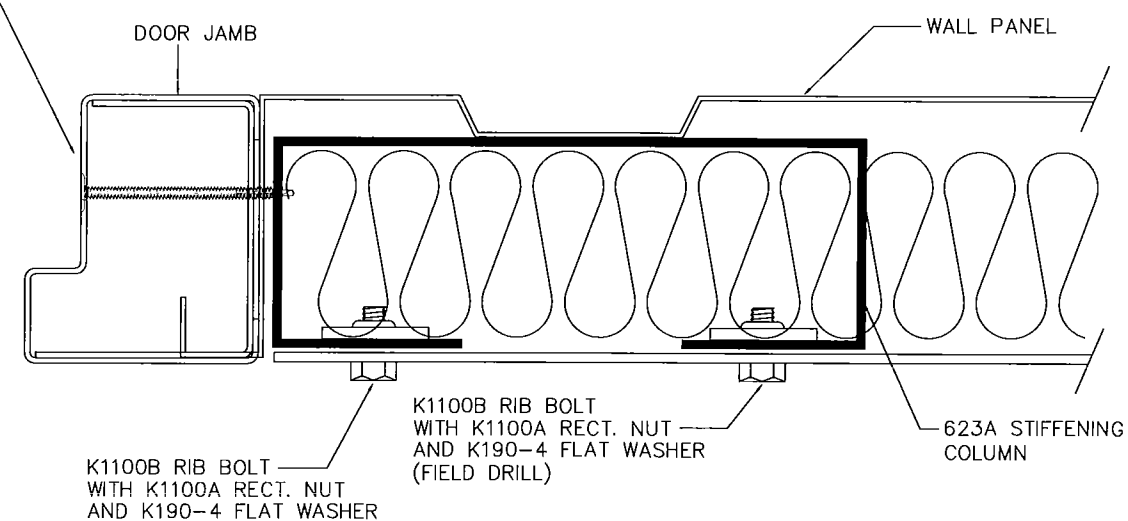
1. INSTALL 623A STIFFENING COLUMNS WITH WALL PANELS.
 2. PLACE STIFFENING COLUMNS IN BASE CHANNEL & BOLT INTO PLACE WITH K1100B 3/8" RIB BOLT, K1100A RECT. NUT AND K190-4 WASHER. (USE HOLE IN STIFFENING COLUMN AS TEMPLATE WHEN FIELD DRILLING IS REQUIRED)
 3. INSTALL WALL CAP OVER WALL PANELS & STIFFENING COLUMNS. BOLT TOGETHER WITH RIB BOLTS. (FIELD DRILLING REQUIRED)*
 4. FASTEN PANEL RIB TO STIFFENING COLUMN WITH K1237-5 #12 FASTENER AT 2'-0" C/C.
 5. FASTEN RIBS OF HEAD PANELS WITH K1235 #14 STITCH SCREWS. (MINIMUM 2 PER PANEL)
- * FOR ENDWALL OF TYPE 'AL' BUILDINGS, BOLT STIFFENING COLUMN TO ENDWALL GIRT. (FIELD DRILLING REQUIRED)

NOTES:

1. THIS STIFFENING KIT WILL NOT WORK IN A CORNER PANEL! REFER TO DRAWING **CSK-1** FOR THIS APPLICATION.
2. FIELD DRILL ALL HOLES FOR 3/8"Ø RIB BOLTS AS REQUIRED. ALL 3/8"Ø RIB BOLTS ARE: K1100B BOLT, K1100A RECT. NUT AND K190-4 WASHER.
3. PRIOR TO CLOSING OFF ACCESS TO INTERIOR OF STIFFENING COLUMN, INSTALL INSULATION IF REQUIRED.



BASE DETAIL



SECTION THRU DOOR

REVISIONS	BY
01-07-98	CBP
12-10-03	RAP
01-24-05	DLR
11-07-06	BHKJ
01-11-07	BHKJ
03-04-09	JMC
02-23-2012	KRK
07-09-2013	RAP
05-18-16	MRW

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PHONE: 800-786-4855
FAX: 304-566-3842



JOB DESCRIPTION
**ACCESSORY STIFFENING
KIT INSTALLATION**

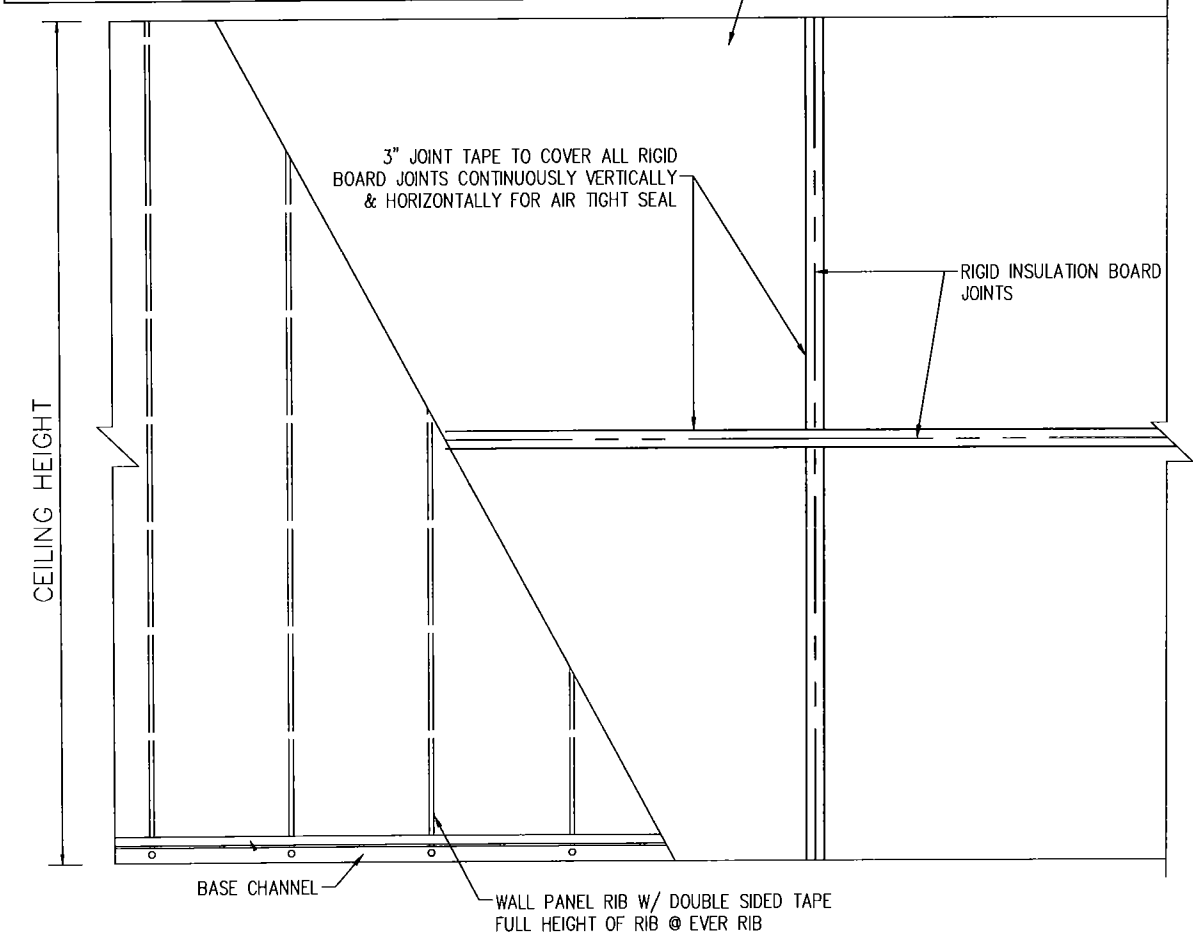
DETAILS

SHEET TITLE

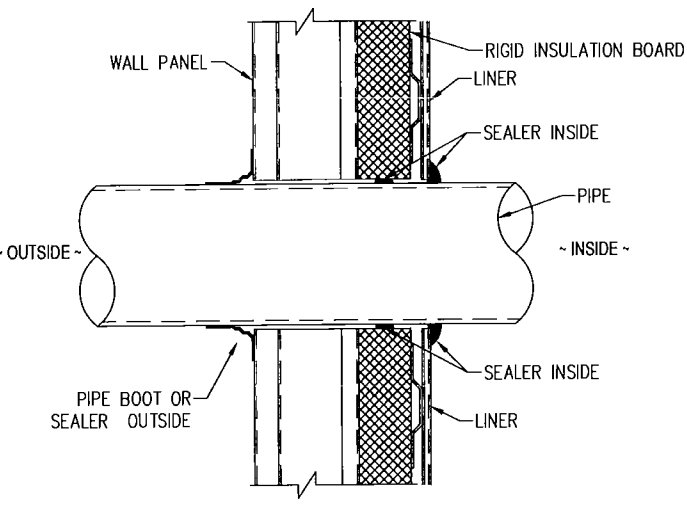
DATE	06-28-96
DRAWN BY	KAG
SCALE	NTS
ORDER NO.	
REVISION	9

ASK-2

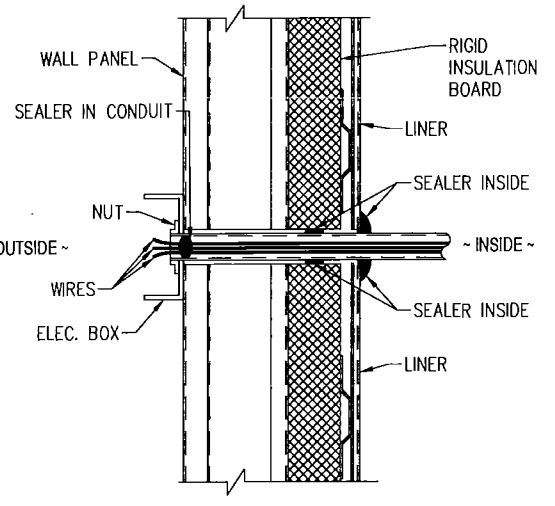
NOTE:
ALL JOINTS **"MUST BE"** TAPED CONTINUOUSLY
TO PROVIDE AIR TIGHT SEAL



RIGID INSULATION BOARD JOINT DETAIL

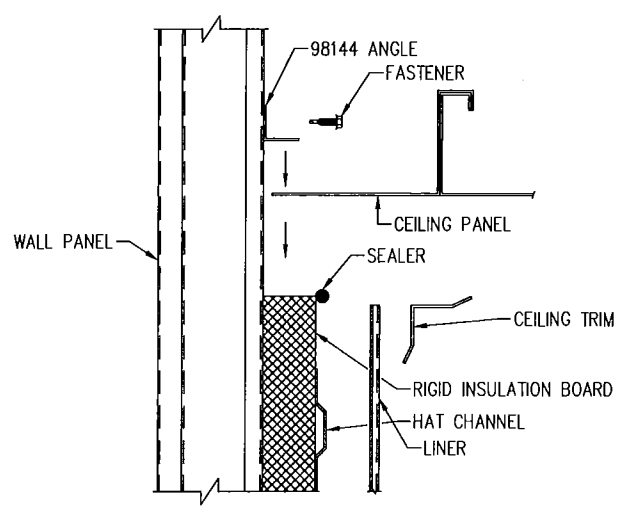


PIPE THROUGH WALL

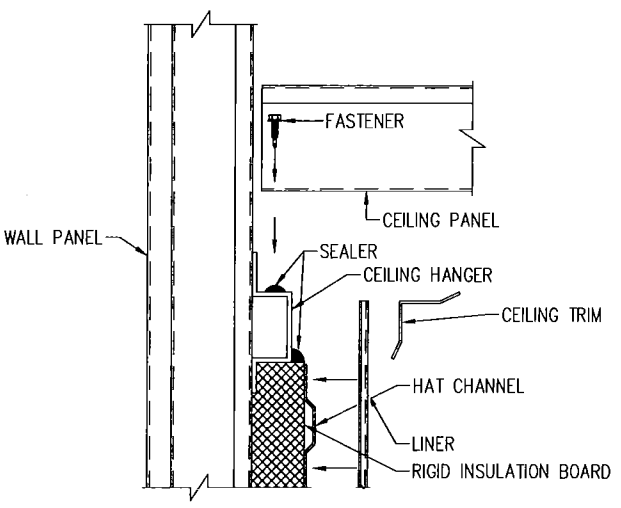


CONDUIT THROUGH WALL

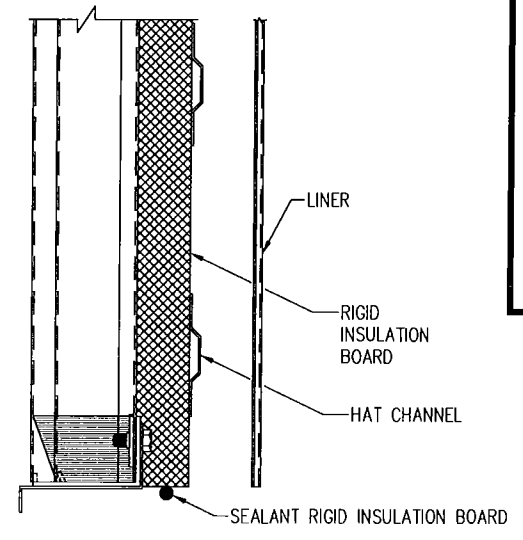
PLEASE NOTE:
MUST BE USED IN CONJUNCTION WITH
FLT DRAWING SERIES



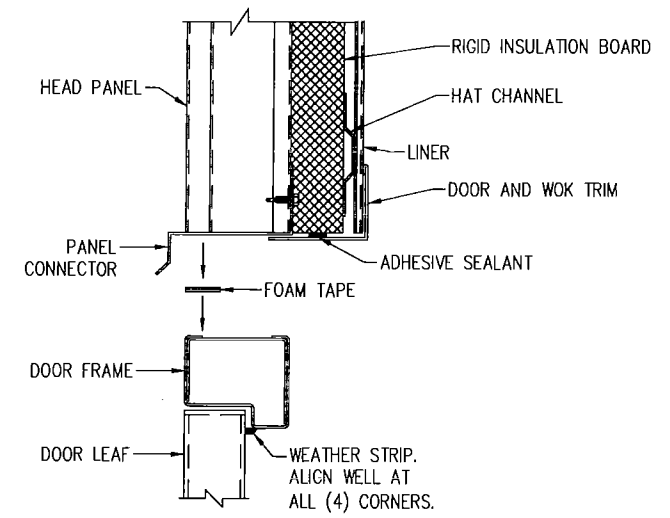
END WALL



SIDE WALL

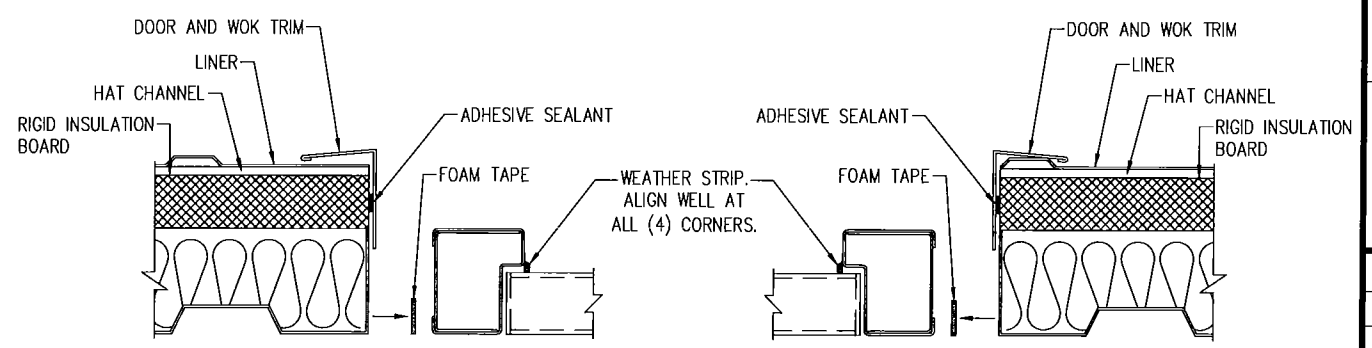


AT BASE



DOORS

PLEASE NOTE:
ALL FLOOR PENETRATIONS MUST BE
SEALED TO PREVENT AIR INFILTRATION.



SECTION VIEW THROUGH WALL OPENING

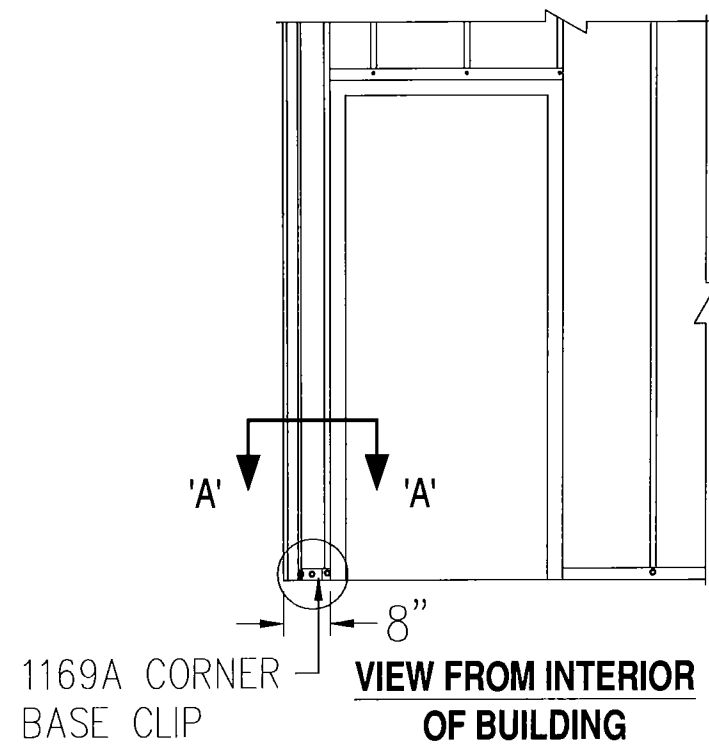
REVISIONS	BY
2/14/17	SCW

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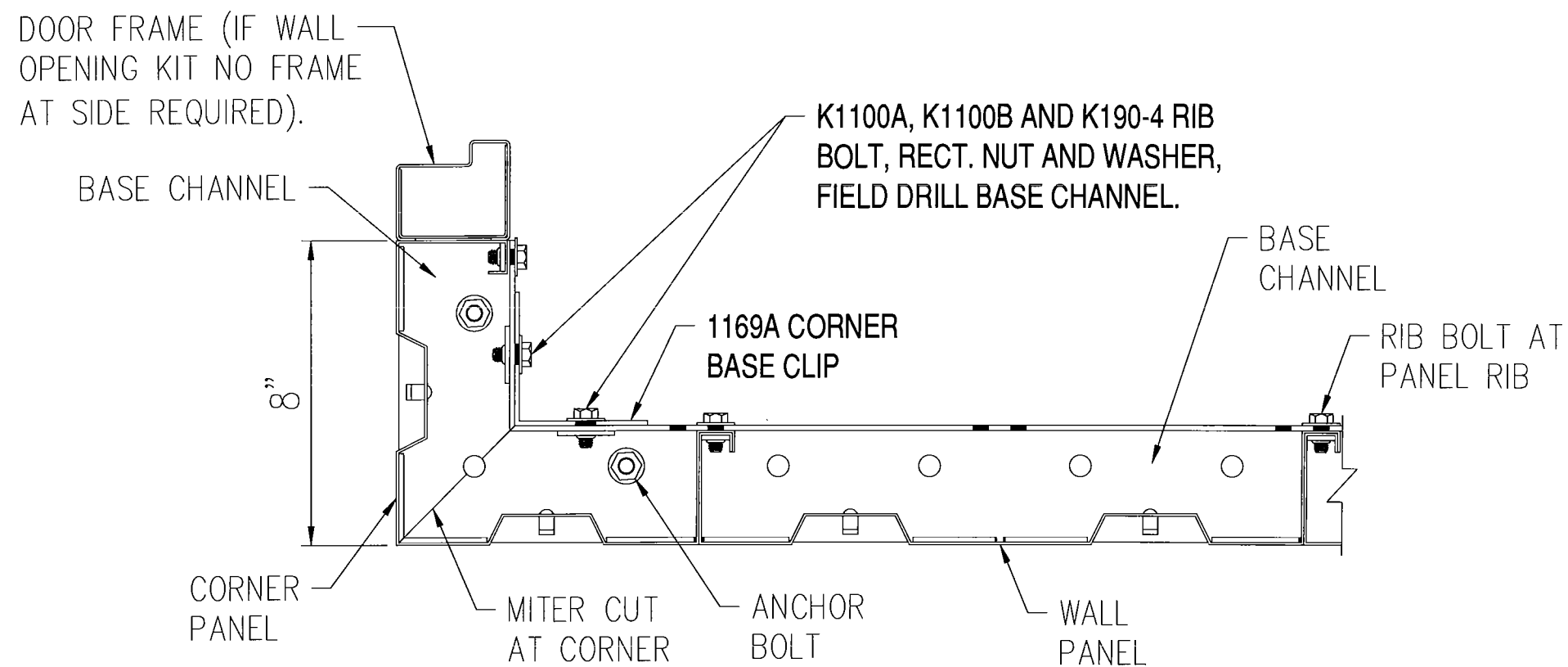
JOB DESCRIPTION	DETAILS FOR AIR-TIGHT BUILDING W/ RIGID INSULATION BOARD	DETAIL
	SHEET TITLE	

DATE	01/26/2017
DRAWN BY	SCW
SCALE	NTS
ORDER NO.	
REVISION	1



REFER TO THE FLOOR PLAN AND ELEVATION DRAWINGS FOR
YOUR SPECIFIC BUILDING TO SEE IF THERE IS A DOOR OR WALL
OPENING KIT WITHOUT SILL PANELS LOCATED 0'-8" FROM CORNER
OF BUILDING.

IF SO INSTALL THE 1169A CORNER BASE CLIP AS SHOWN IN
SECTION - 'A' BELOW.



SECTION - 'A'

REVISIONS	BY
08-15-16	JMC

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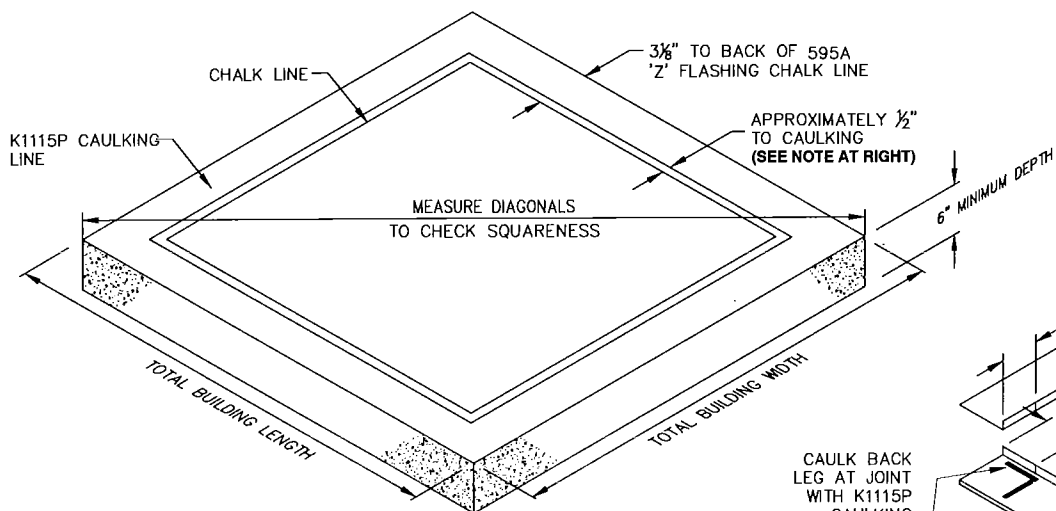


JOB DESCRIPTION
**INSTALLATION DETAIL AT
BASE FOR DOOR 8" FROM
CORNER OF BUILDING**

SHEET TITLE
DETAIL

DATE	09-19-2012
DRAWN BY	RAP
SCALE	NTS
ORDER NO.	
REVISION	1

BASE-D-M



ERECTION PROCEDURE

NOTE: REFER TO THE INDIVIDUAL BASE CHANNEL AND ANCHOR LAYOUT DRAWING PROVIDED SPECIFICALLY FOR YOUR BUILDING BEFORE STARTING BASE CHANNEL.

- STEP - 1.** - CHECK FOUNDATION SQUARENESS. (SEE ALLOWABLE TOLERANCES BELOW). CONCRETE MUST BE CLEAN AND DRY BEFORE APPLYING K1115P TUBE CAULKING.
- STEP - 2.** - SNAP CHALK LINE AS SHOWN. CAULK WITH K1115P TUBE CAULKING AS SHOWN ABOVE, OMITTING CAULK AT ANY OVERHEAD DOOR OPENINGS.
- STEP - 3.** - NOTCH 'Z' FLASHING CORNER AS SHOWN ABOVE OR OPTIONAL CORNER DETAIL AT RIGHT.
- STEP - 4.** - POSITION 'Z' FLASHING WITH BACK EDGE AT CHALK LINE. OMIT 'Z' FLASHING AT ANY OVERHEAD DOOR OPENINGS, (CONTINUE UNDER 8" JAMBS). CAULK LAPS AS SHOWN. CAULK 'Z' FLASHING AT CORNERS AS SHOWN ABOVE OR OPTIONAL DETAIL TO RIGHT.
- STEP - 5.** - MITER BASE CHANNEL FOR CORNERS AND ATTACH USING HOLE AS TEMPLATE AND DRILLING THROUGH 'Z' FLASHING. SEE ABOVE DETAIL FOR POSITIONING.
- STEP - 6.** - CONTINUE AROUND PERIMETER OF SLAB. EACH BASE CHANNEL REQUIRES AN ANCHOR AT EACH END. SEE BASE CHANNEL AND ANCHOR LAYOUT FOR YOUR SPECIFIC BUILDING FOR MAXIMUM SPACE BETWEEN ANCHORS.
- STEP - 7.** - PLACE SHIMS UNDER 'Z' FLASHING WHERE NECESSARY TO KEEP BASE CHANNEL LEVEL.
- STEP - 8.** - APPLY FINAL BEAD OF CAULK AT THE INSIDE PERIMETER OF 'Z' FLASHING.

NOTE: IT IS RECOMMENDED THAT THIS CAULKING BE DONE AFTER EXTERIOR WALLS AND ROOF ARE INSTALLED AND JUST PRIOR TO ANY WALL LINER INSTALLATION IF USED.

STOCK BASE CHANNEL LENGTHS	
PART NO.	LENGTH
J1	1'-3 3/8"
J2	2'-7 7/8"
J3	3'-11 1/8"
J4	5'-3 3/8"
J5	6'-7 7/8"
J6	7'-11 1/8"
J7	9'-3 3/8"
J8	10'-7 7/8"
J9	11'-11 1/8"

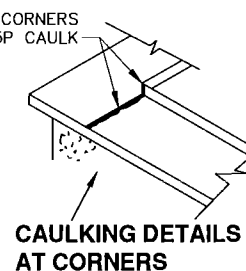
ALLOWABLE FOUNDATION TOLERANCES

WIDTH AND LENGTH	+/- 1/8" IN 12'-0"
	+/- 1/4" OVERALL
OUT OF SQUARE DIAGONALLY	+/- 1/2"
OUT OF LEVEL	+/- 1/8" IN 20'-0"
	+/- 1/4" OVERALL

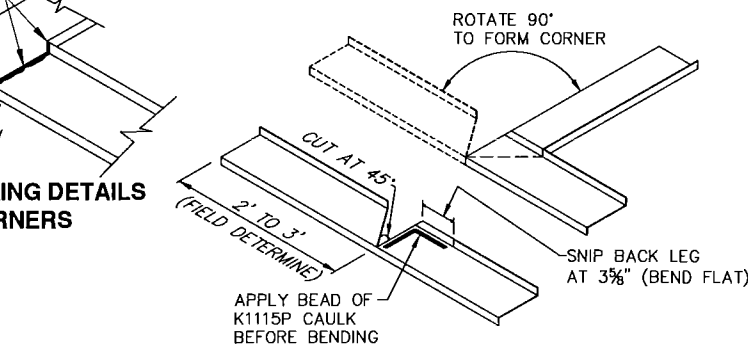
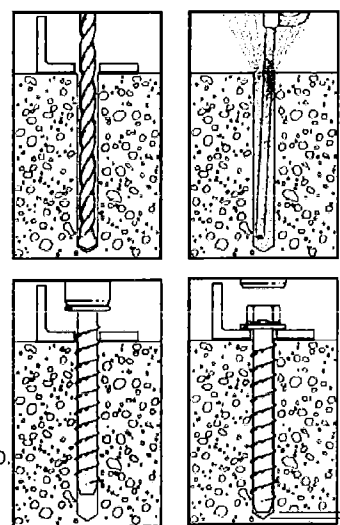
NOTES:

- DRILL A HOLE IN THE BASE MATERIAL USING A CARBIDE DRILL BIT THE SAME DIAMETER AS THE NOMINAL DIAMETER OF THE ANCHOR TO BE INSTALLED. DRILL THE HOLE TO THE SPECIFIED EMBEDMENT DEPTH PLUS 1/2" MINIMUM TO ALLOW THE THREAD TAPPING DUST TO SETTLE AND BLOW IT CLEAN USING COMPRESSED AIR. ALTERNATIVELY, DRILL THE HOLE DEEP ENOUGH TO ACCOMMODATE EMBEDMENT DEPTH AND DUST FROM DRILLING AND TAPPING. INSERT THE ANCHOR THROUGH THE FIXTURE AND INTO THE HOLE. TIGHTEN THE ANCHOR INTO THE BASE MATERIAL UNTIL THE HEX HEAD CONTACTS THE FIXTURE. IF THE ANCHOR WILL NOT INSTALL COMPLETELY, REMOVE THE ANCHOR AND ASSURE THAT ALL DUST HAS BEEN EVACUATED OR DRILL THE HOLE DEEPER. BEGIN RE-INSTALLATION OF THE ANCHOR BY HAND TO PREVENT CROSS-THREADING.
- NEVER CAULK OUTSIDE FACE OF PANEL / BASE CHANNEL TO FOUNDATION. THIS WILL RESULT IN A WATER LEAKING SITUATION.

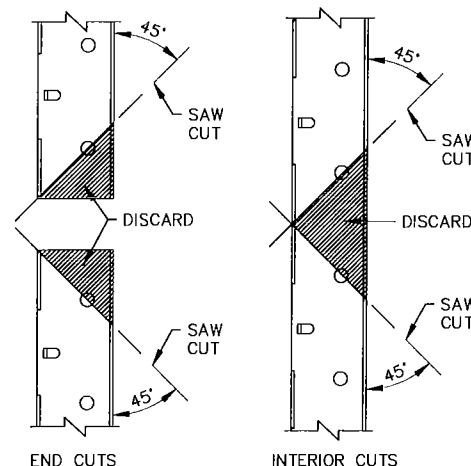
NOTE:
MEASURE 32" c/c OF PANEL NOTCH IN BASE CHANNEL THROUGH BASE CHANNEL JOINT. GAP SHOULD OCCUR AT JOINT.



STANDARD CORNER ASSEMBLY

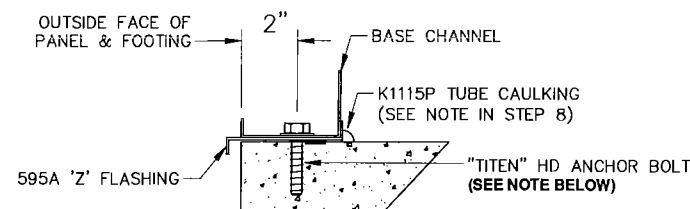


OPTIONAL CORNER FLASHING DETAIL



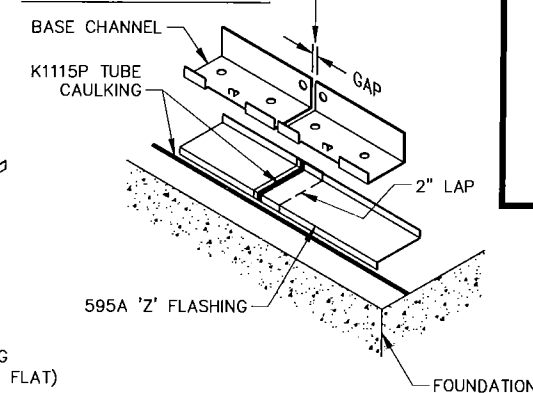
MITER CUT AT CORNER DETAIL

TO MINIMIZE THE NUMBER OF FIELD CUTS, LAYOUT CHANNELS PRIOR TO CUTTING. SEE BUILDING ELEVATIONS AND ANCHOR PLAN.



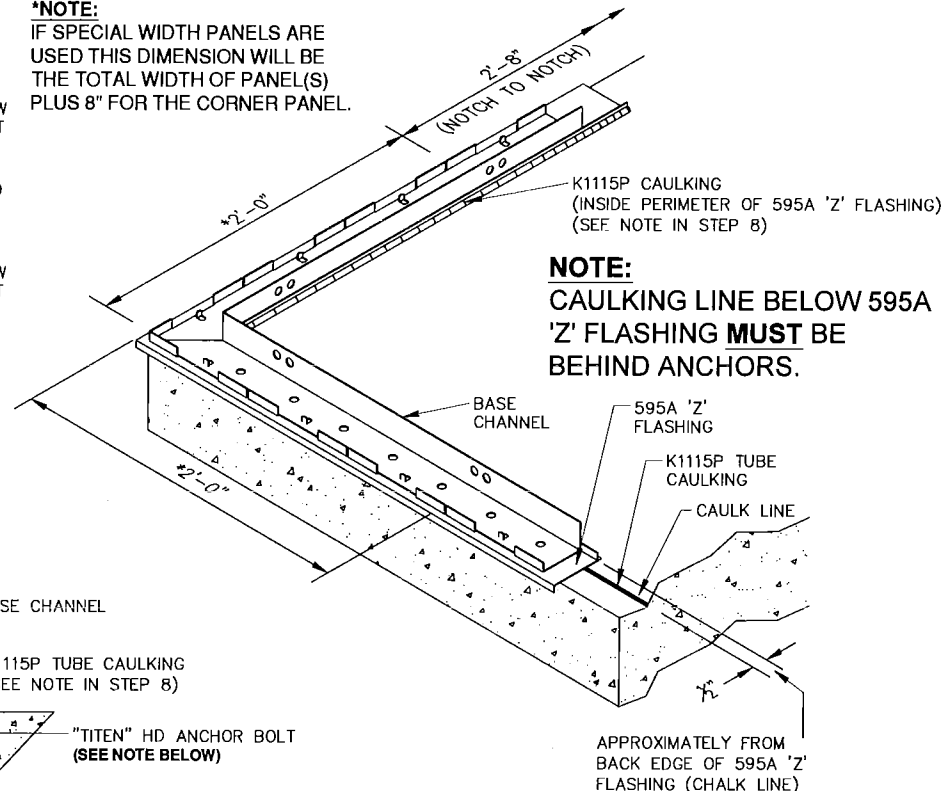
SECTION THROUGH BASE

DO NOT BUTT CHANNELS!!



DETAIL AT BASE CHANNEL JOINT

***NOTE:**
IF SPECIAL WIDTH PANELS ARE USED THIS DIMENSION WILL BE THE TOTAL WIDTH OF PANEL(S) PLUS 8" FOR THE CORNER PANEL.



NOTE:
CAULKING LINE BELOW 595A 'Z' FLASHING **MUST** BE BEHIND ANCHORS.

REVISIONS	BY
04-01-15	JMC
06-23-15	JMC
08-30-16	JMC

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328 INDUSTRIAL PARK DRIVE
ELEANOR, WV 26070
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PHONE: 800-786-4855
FAX: 304-586-3842

SECTION DESCRIPTION
'Z' FLASHING, BASE CHANNEL AND ANCHOR INSTALLATION

SHEET TITLE
SECTIONS AND DETAIL

DATE 09-14-2012
DRAWN BY KRK
SCALE NTS
ORDER NO.
REVISION 3

BASE-HD-M

EAVE TRIM INSTALLATION

NOTES: 1.)EAVE TRIM IS TO BE INSTALLED AFTER RAKE TRIM) SEE DRAWING BOX-AL-2.
2.)REMOVE PROTECTIVE FILM FROM TRIM BEFORE INSTALLATION.
3.)EAVE TRIMS ARE FORMED TO SLIP FIT AT SPLICES. TEST FIT PIECES ON GROUND BEFORE INSTALLATION.

STEP 1. ATTACH 98231A OR 953A EAVE TRIM HANGER TO WEB OF FIRST ROOF PANEL NEAR RIB, AND EVERY SECOND PANEL THEREAFTER DOWN TO AND INCLUDING THE LAST PANEL WITH (1) K1237-1 FASTENER.

STEP 2. DETERMINE EAVE TRIM LENGTH REQUIRED. NOTE:EAVE TRIM STOPS FLUSH WITH EACH END OF BUILDING. (FIELD CUT AS REQUIRED)

A. BUILDINGS LESS THAN 12'-0" IN LENGTH.

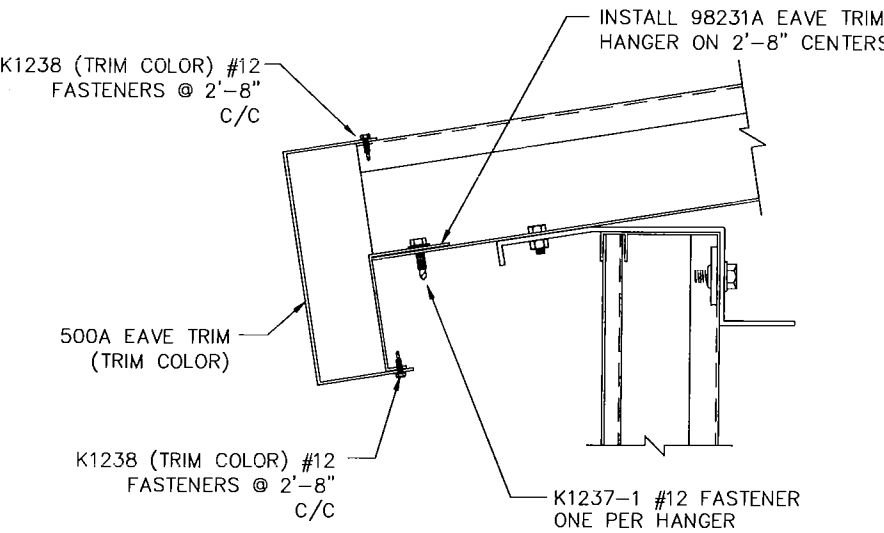
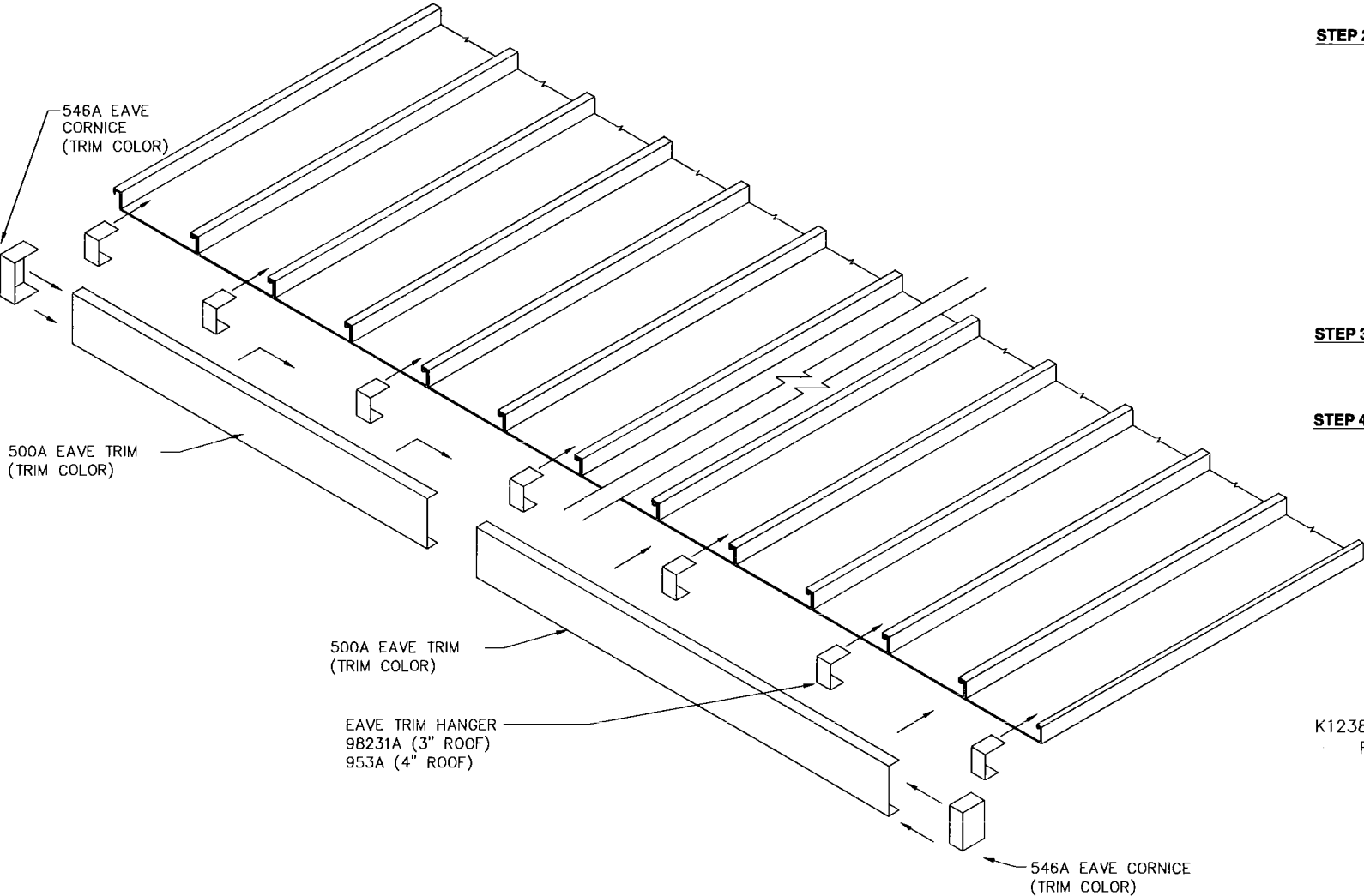
FIELD CUT EAVE TRIM TO CORRECT LENGTH.

B. BUILDINGS 12'-0" AND LONGER.

EAVE TRIM WILL CONSIST OF A STARTING AND FINISHING SECTION PLUS ANY REQUIRED INTERMEDIATE SECTIONS TO OBTAIN REQUIRED TOTAL LENGTH. NOTE: ALLOW 2" OF OVERLAP AT EACH SPLICE. EAVE TRIMS ARE MANUFACTURED TO NORMALLY ALLOW THEM TO BE LAPPED WITHOUT NOTCHING. FIELD NOTCH IF REQUIRED. TEST FIT EAVE TRIMS TOGETHER.

STEP 3. ATTACH THE EAVE TRIM TO ROOF PANEL RIB WITH (1) K1238 FASTENER PER EVERY OTHER PANEL. BE SURE END OF EAVE TRIM AND RIB OF FIRST ROOF PANEL LINE UP. FASTEN EAVE TRIM TO HANGER.

STEP 4. SLIDE NEXT EAVE TRIM INTO EXISTING TRIM ALLOWING APPROXIMATELY 2" LAPS. ATTACH TRIM TO ROOF WITH K1238 FASTENERS. CONTINUE UNTIL COMPLETED. RIB OF LAST PANEL IS TO LINE UP WITH END OF TRIM. FIELD CUT AS REQUIRED.



SECTION THRU EAVE TRIM

REVISIONS	BY

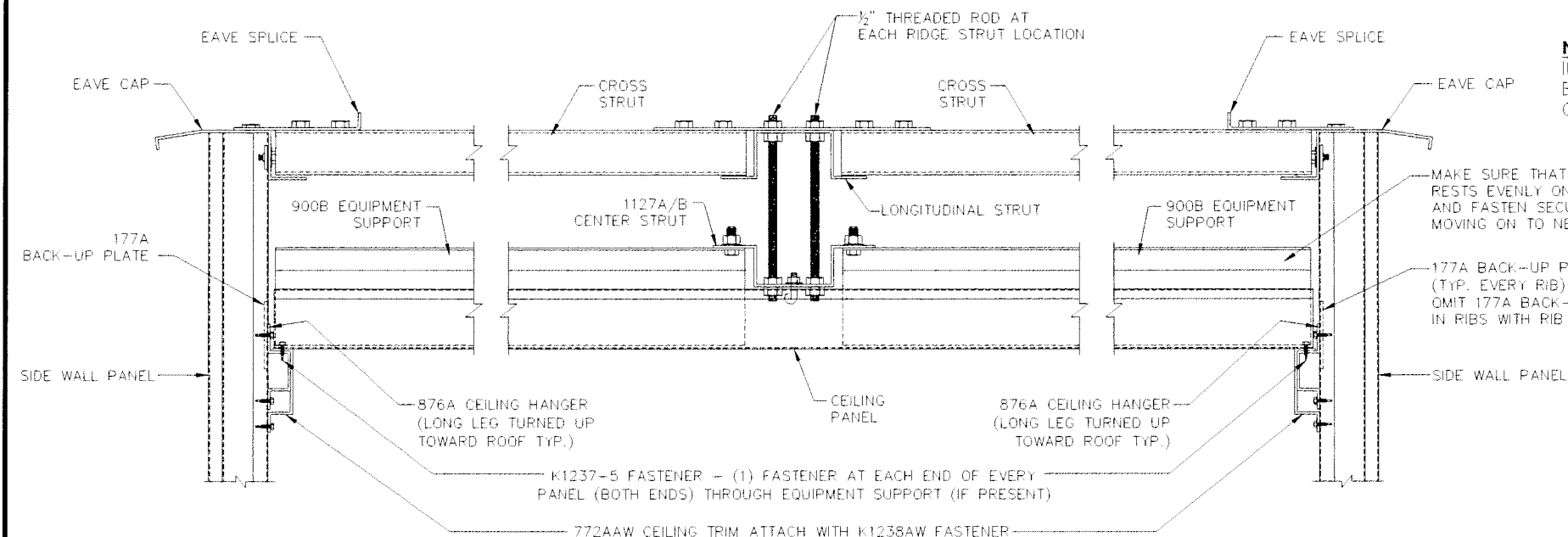
PARKLINE, INC.
RT. 62, ELEANOR INDUSTRIAL PARK
ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855
FAX: 304-586-3842
ENGINEER: TOM HARDING
THARDING@PARKLINE.COM



JOB DESCRIPTION	BOX EAVE TRIM INSTALLATION FOR TYPE 'A' BUILDINGS WITH 3" & 4" RIB ROOF PANELS
SHEET TITLE	SECTIONS AND DETAILS

DATE	11-21-16
DRAWN BY	DJM
SCALE	NTS
ORDER NO.	
REVISION	0

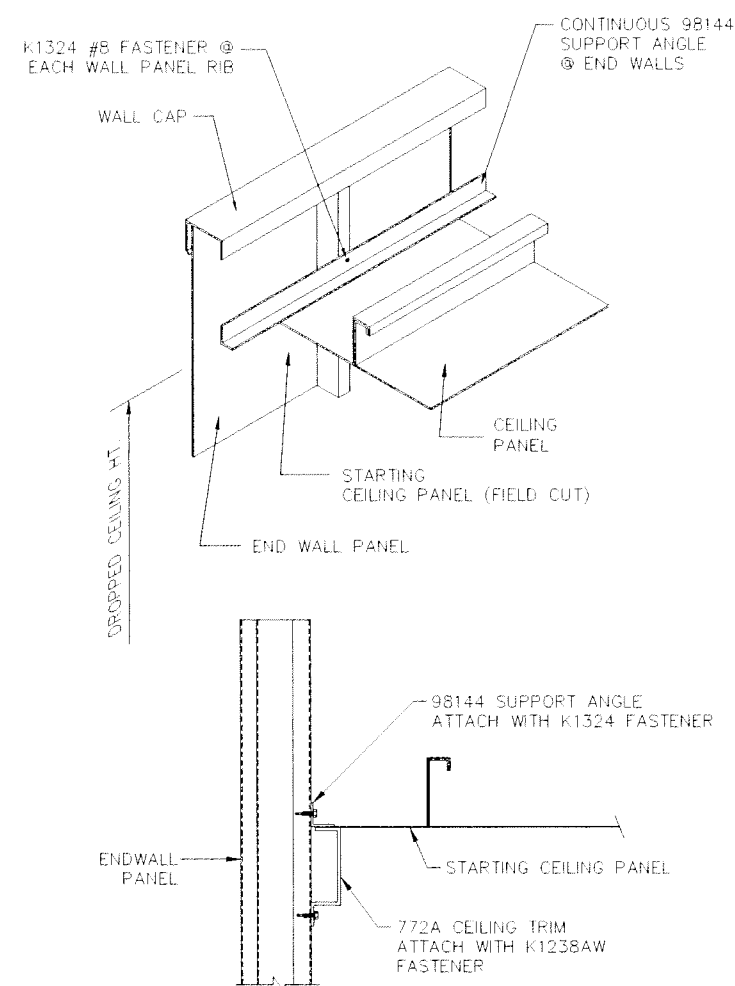
BOX-AL-3



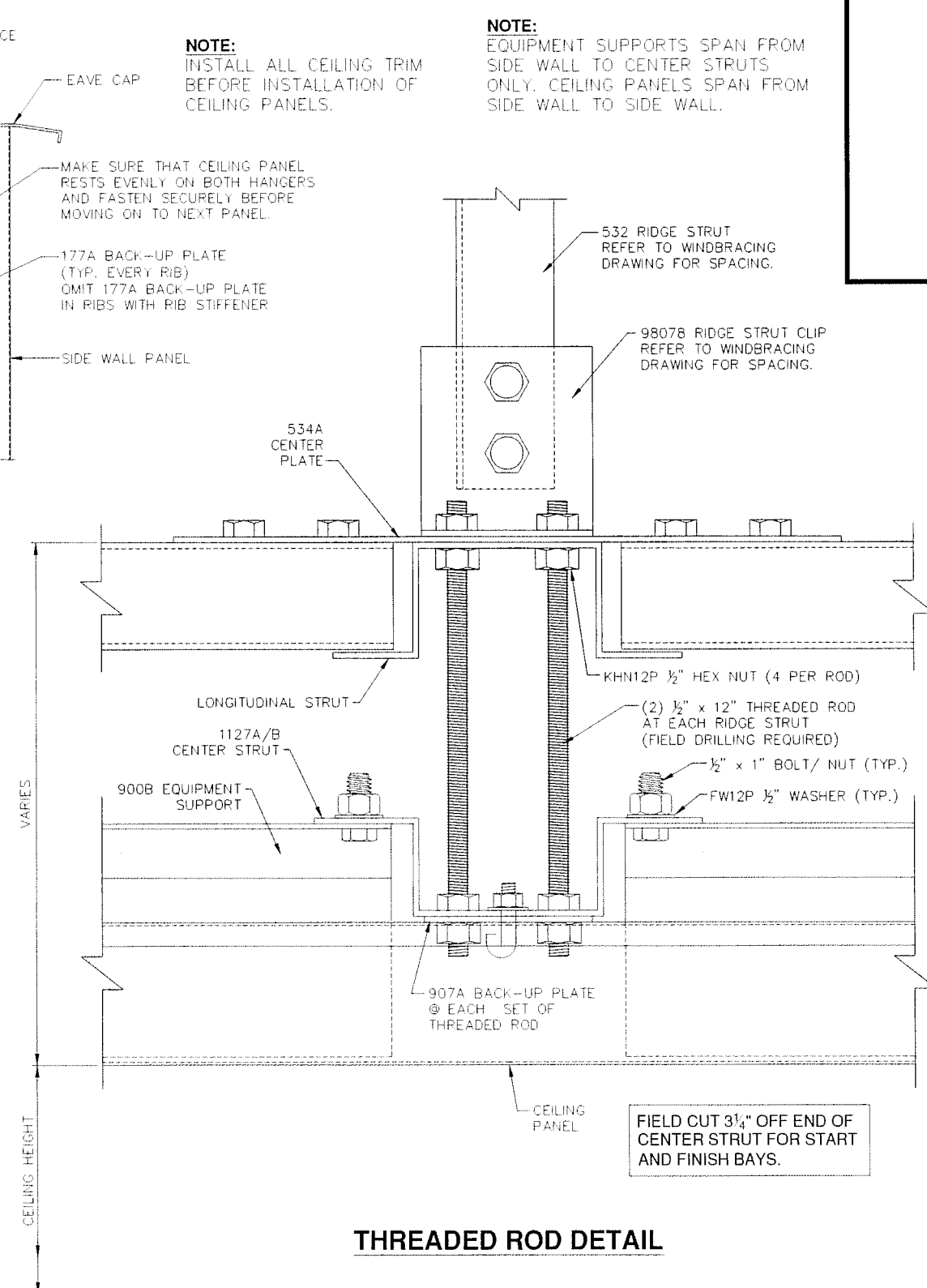
SECTION THROUGH CEILING @ SIDE WALLS

INSTALLATION:

- STEP 1** INSTALL CONTINUOUS 98144 SUPPORT ANGLES AT CEILING HEIGHT ON END WALLS.
- STEP 2** INSTALL 876A CEILING HANGERS AT SIDE WALLS USING THE TOP AND BOTTOM FASTENERS. INSTALL 772A CEILING TRIM AT ALL WALLS USING K1238AW FASTENERS, FIELD CUTTING AND LEAVING THE LAST 24" (APPROX.) OF HANGERS OFF UNTIL THE LAST OF THE CEILING PANELS HAVE BEEN LIFTED ABOVE FINISHED CEILING HEIGHT.
- STEP 3** INSTALL THE 1127A/B CENTER STRUTS. CUT $3\frac{1}{4}$ " OFF THE FIRST AND LAST STRUT TO CLEAR BUILDING END WALLS. THESE STRUTS WILL BUTT END-TO-END THE LENGTH OF THE BUILDING. USE $\frac{1}{2}$ " THREADED ROD AND HEX NUTS AS SHOWN.
- STEP 4** START INSTALLING CEILING PANELS. LIFT CEILING PANELS UP TO REST ON BOTH SIDEWALL HANGERS BY RESTING PANELS ON ONE HANGER FIRST AND THEN PULLING PANELS BACK TO REST ON BOTH SIDE WALL HANGERS. WHEN CEILING PANELS ARE RESTING EVENLY ON SIDE WALL HANGERS, INSTALL THE CENTER J-BOLT AND THE SELF-DRILLING FASTENERS THROUGH THE EQUIPMENT SUPPORTS AND CEILING PANELS INTO SIDEWALL HANGERS.
- STEP 5** INSTALL THE EQUIPMENT SUPPORTS USING (2) $\frac{1}{2}$ " x 1" BOLTS/ NUTS & WASHERS AT THE ENDS AT THE CENTER OF THE BUILDING AND RESTING THE OTHER END OF SUPPORTS ON SIDE WALL CEILING HANGERS.
- STEP 6** AFTER THE LAST FULL CEILING PANEL AND THE FINISH CEILING PANEL HAVE BEEN LIFTED ABOVE CEILING LINE, INSTALL REMAINING SECTIONS OF 876A SIDEWALL HANGERS AND TRIM. DROP CEILING PANELS INTO PLACE AND FASTEN.
- STEP 7** INSTALL WALL LINER PER STANDARD DRAWINGS.



SECTION THROUGH CEILING @ END WALL



NOTES:

- EQUIPMENT SUPPORTS ARE TO BE INSTALLED IN THE CENTER OF PANEL UNLESS NOTED OTHERWISE ON STIFFENER LAYOUT.
- ALWAYS MARK STIFFENER LOCATIONS FOR FUTURE ATTACHMENT OF ACCESSORIES.
- $\frac{1}{2}$ " THREADED ROD PROVIDED AT EACH RIDGE STRUT LOCATION. SEE WIND BRACING LAYOUT.
- USE THIS DRAWING IN CONJUNCTION WITH WIND BRACING LAYOUT.
- SEE DRAWING CEIL-STIF-RN FOR $\frac{3}{8}$ " RIBBED RIVET NUT INSTALLATION (IF SUPPLIED).

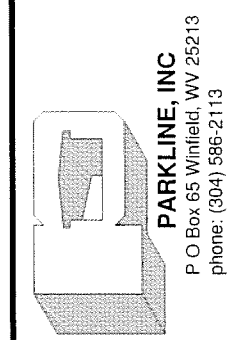
NOTE:
INSTALL ALL CEILING TRIM BEFORE INSTALLATION OF CEILING PANELS.

NOTE:
EQUIPMENT SUPPORTS SPAN FROM SIDE WALL TO CENTER STRUTS ONLY. CEILING PANELS SPAN FROM SIDE WALL TO SIDE WALL.

VARIES
CEILING HEIGHT

FIELD CUT $3\frac{1}{4}$ " OFF END OF CENTER STRUT FOR START AND FINISH BAYS.

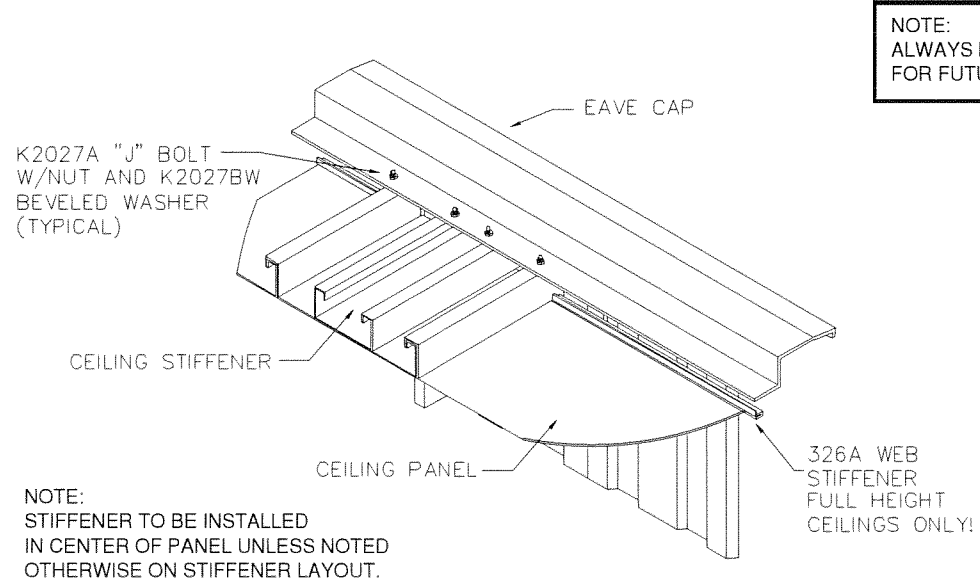
REVISIONS	BY
11-11-10	JMC
11-12-10	JMC
1-20-11	CBP
02-09-11	TLC
07-01-11	KRK



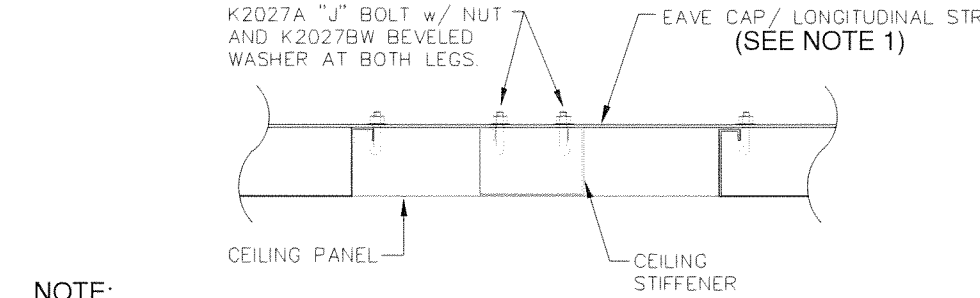
JOB DESCRIPTION	1 PIECE DROPPED CEILING DETAILS FOR 'AL' BLDGS. W/ EQUIPMENT SUPPORTS FOR 20'-0" WIDE OR MORE	SHEET TITLE	SECTIONS AND DETAILS

DATE	11-03-10
DRAWN BY	JMC
SCALE	NTS
ORDER NO	
REVISION	5

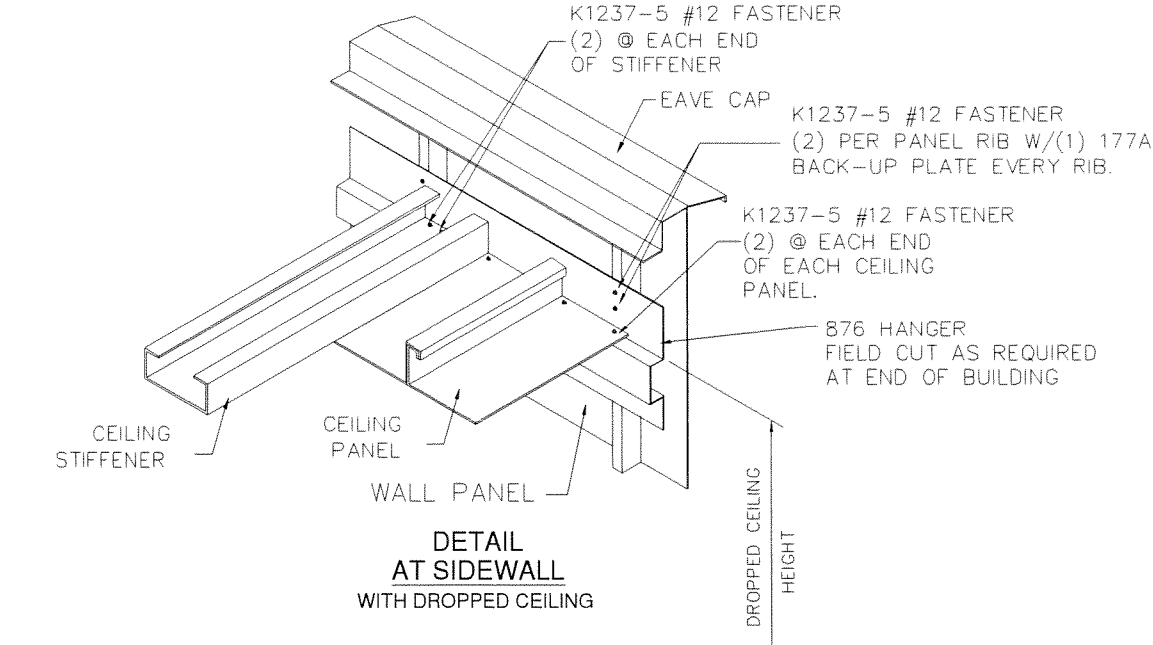
CEIL-AL-3



DETAIL AT SIDEWALL
(FULL HEIGHT CEILING)

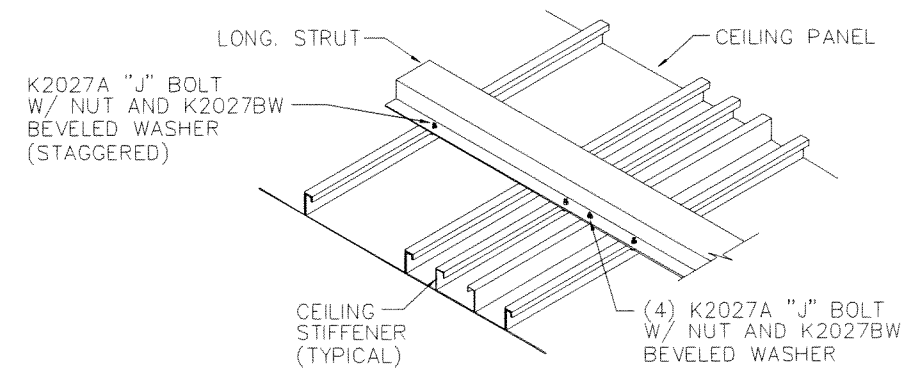


SECTION AT SIDEWALL EAVE CAP
(FULL HEIGHT CEILING)

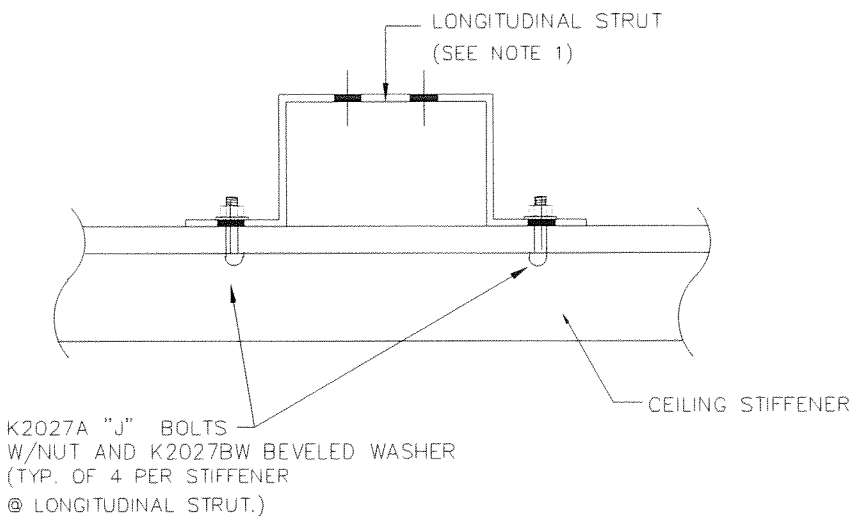


NOTE:
ALWAYS MARK STIFFENER LOCATIONS
FOR FUTURE ATTACHMENT OF ACCESSORIES.

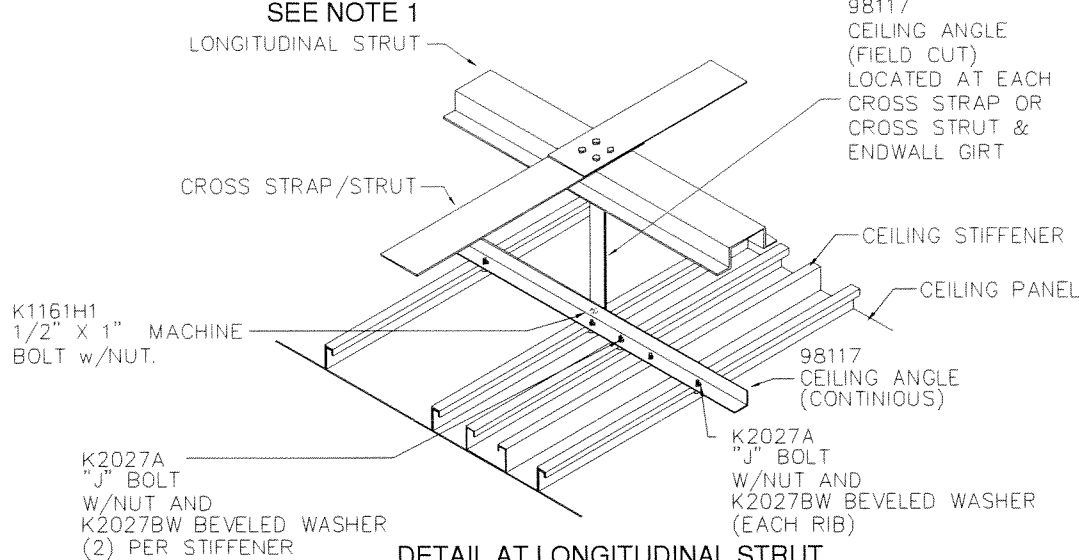
- NOTES:**
- ① ON BUILDINGS EQUIPPED WITH LONGITUDINAL STRUT ONLY. SEE WINDBRACING DRAWING TO DETERMINE YOUR BUILDING REQUIREMENTS.
 - ② EACH CEILING STIFFENER REQUIRES (4) TOTAL K2027A "J" BOLTS WITH NUT AND K2027BW BEVELED WASHER @ EAVE CAP AND (4) TOTAL @ LONGITUDINAL STRUT, IF LONGITUDINAL STRUT IS USED.
 - ③ REFER TO STANDARD CEILING INSTALLATION DRAWINGS, (CEIL-AL-1 FOR FULL HEIGHT) AND (CEIL-AL-2 FOR DROPPED CEILING) FOR ADDITIONAL CEILING DETAILS.
 - ④ CEILING STIFFENERS MAY ALSO BE USED WITHOUT CEILING PANELS.
 - ⑤ CEILING STIFFENERS MUST BE INSTALLED SIMULTANEOUSLY WITH CEILING PANELS.



DETAIL AT LONGITUDINAL STRUT
(FULL HEIGHT CEILING)



SECTION THRU LONGITUDINAL STRUT
(FULL HEIGHT CEILING)



DETAIL AT LONGITUDINAL STRUT
WITH DROPPED CEILING
BUILDINGS W/ LONGITUDINAL STRUT ONLY!

REVISIONS	BY
05-22-03	PAP
07-18-03	PAP
11-03-06	BHJ
03-01-12	MC

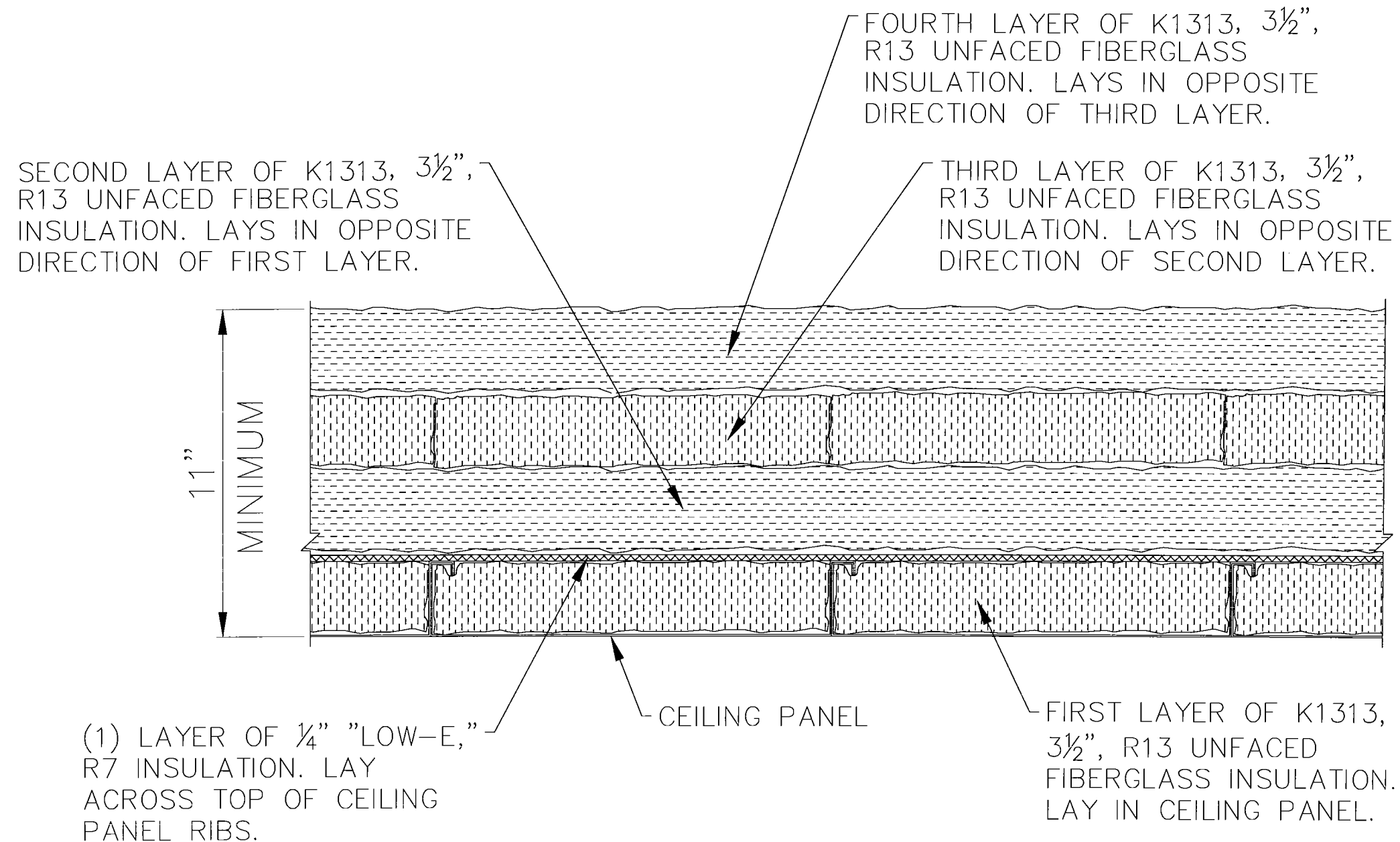
PARKLINE, INC
P O Box 65 Winfield, WV 25213
phone: (304) 586-2113

CEILING REINFORCEMENT FOR LIGHTING, CABLE TRAYS, ETC. FOR 'AL' TYPE BUILDING

SECTIONS AND DETAILS

DATE	03-06-03
DRAWN BY	CBP
SCALE	NTS
ORDER NO.	
REVISION	4

CEIL-AL-STIF

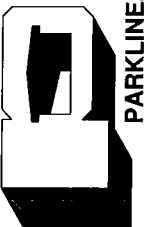


R49 INSULATION DETAIL

NOTES:

1. USE THIS DRAWING IN CONJUNCTION WITH DRAWING SERIES #CEIL-AL-2, 3 OR 4 FOR TYPE 'AL' BUILDINGS AND DRAWING #CEIL-S14 OR #CEIL-S14-PE2 FOR TYPE 'S' BUILDINGS.
2. CEILING **MUST BE** DROPPED A MINIMUM OF 11" FOR TYPE 'S' BUILDINGS, 13" FOR TYPE 'AL' BUILDINGS.
3. REFER TO YOUR JOB SPECIFIC ELEVATION DRAWING FOR REQUIRED CEILING HEIGHT.

REVISIONS	BY
11-15-10	TLC
05-17-11	TLC



PARKLINE, INC
P O Box 65 Winfield, WV 25213
phone: (304) 586-2113

JOB DESCRIPTION
**R49 CEILING INSULATION SYSTEM
FOR TYPE 'S' AND 'AL' BUILDINGS**

DETAILS

SHEET TITLE

DATE 04-20-10

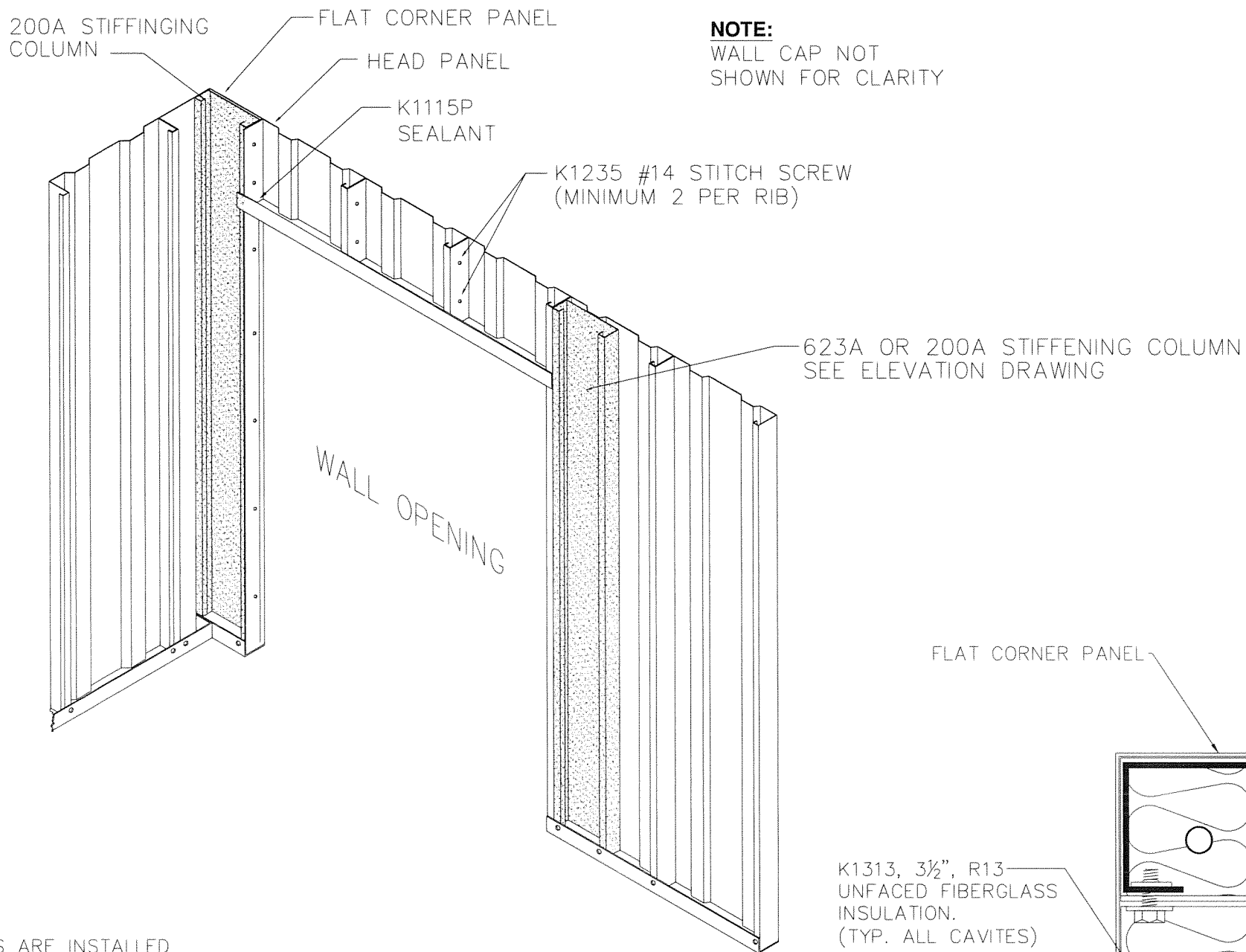
DRAWN BY RAP

SCALE N.T.S.

ORDER NO.

REVISION 2

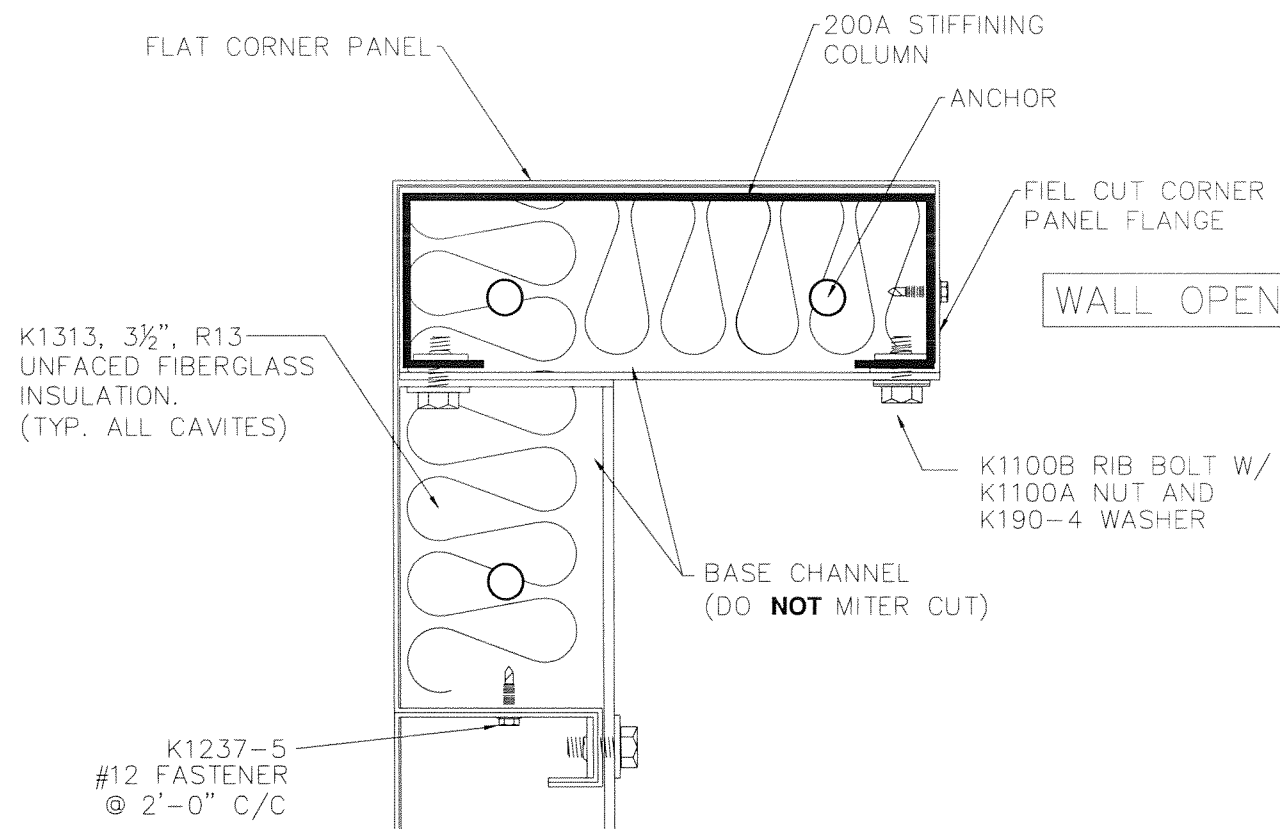
CEIL-R49



STIFFENING COLUMNS ARE INSTALLED TO HELP RESIST WIND PRESSURE AND STRENGTHEN WALLS THAT HAVE BEEN WEAKENED BY PANEL OPENINGS. REFER TO YOUR JOB SPECIFIC ELEVATION DRAWING FOR ACCESSORIES THAT REQUIRE STIFFENING COLUMNS.

ASSEMBLY PROCEDURE

- STEP 1.** FIELD CUT IN—TURNING RIB FROM CORNER PANEL & HEAD OR WALL PANEL.
- STEP 2.** INSTALL STIFFENING COLUMN AND INSULATE COLUMN AND PANEL AS REQUIRED.
- STEP 3.** BOLT STIFFENER INTO PLACE WITH 3/8" RIB BOLTS.
- STEP 4.** INSTALL WALL CAP OVER WALL PANELS AND STIFFENERS. BOLT TOGETHER WITH RIB BOLTS AS REQUIRED.
- STEP 5.** FASTEN PANEL RIB TO STIFFENER WITH K1237-5 FASTENER AT 2'-0" C/C.
- STEP 6.** FASTEN RIBS OF HEAD PANELS WITH K1235 STITCH SCREW (MINIMUM 2 PER PANEL.)



BASE DETAIL

REVISIONS	BY

PARKLINE, INC.
328 INDUSTRIAL PARK DRIVE
ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855
FAX: 304-586-3842

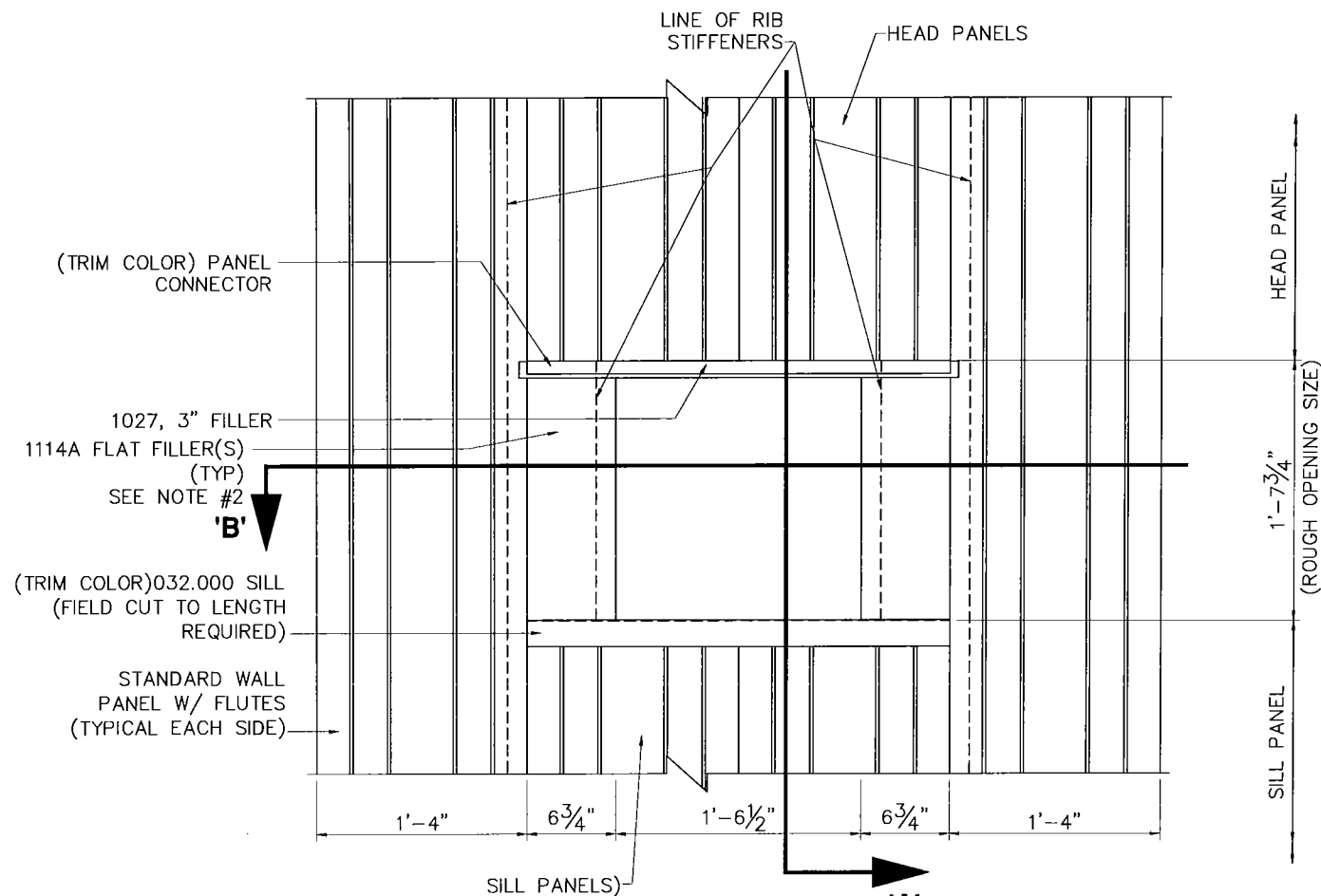


**WALL OPENING CORNER
STIFFENING COLUMN
INSTALLATION**

SECTIONS AND DETAILS

DATE	04-30-19
DRAWN BY	ABH
SCALE	NTS
ORDER NO.	
REVISION	0

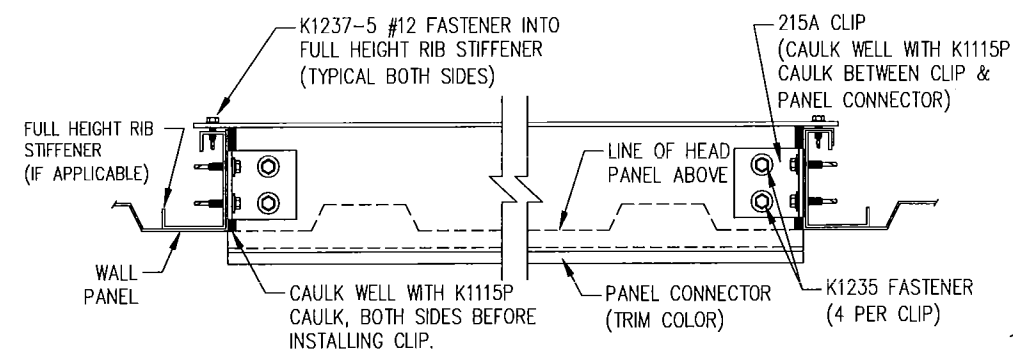
CSK-2



ELEVATION
AS VIEWED
FROM EXTERIOR

NOTES:

1. REFER TO DRAWING# WOK & WOK-FIL-2 FOR BASIC WALL OPENING INSTALLATION DETAILS.
2. DEPENDING ON ACTUAL LOCATION OF FAN UNIT IN A WALL, FILLER PANEL(S) SIZE MAY DIFFER.

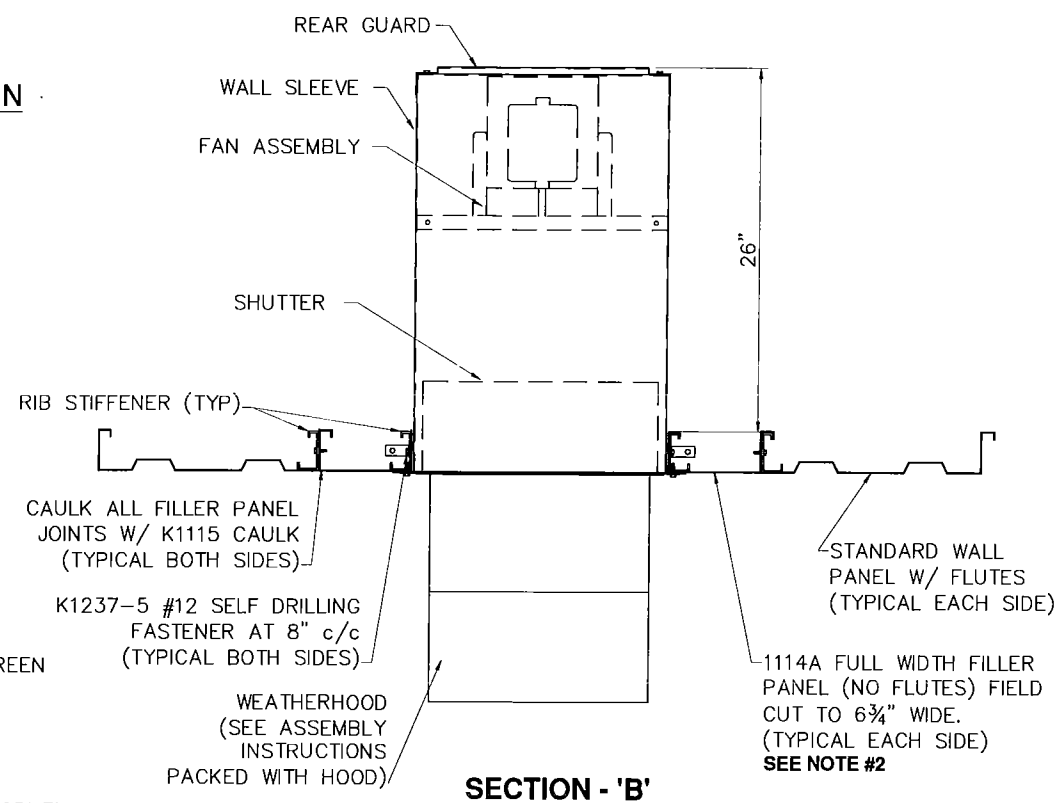
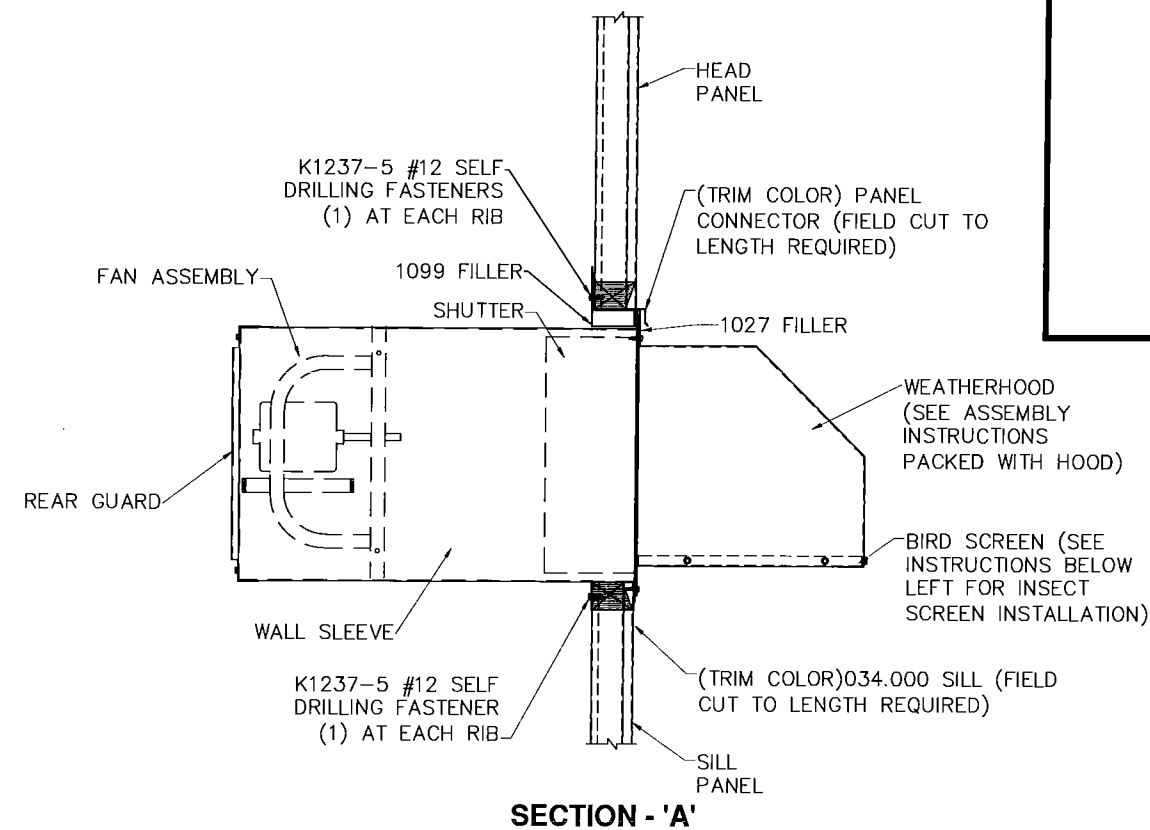
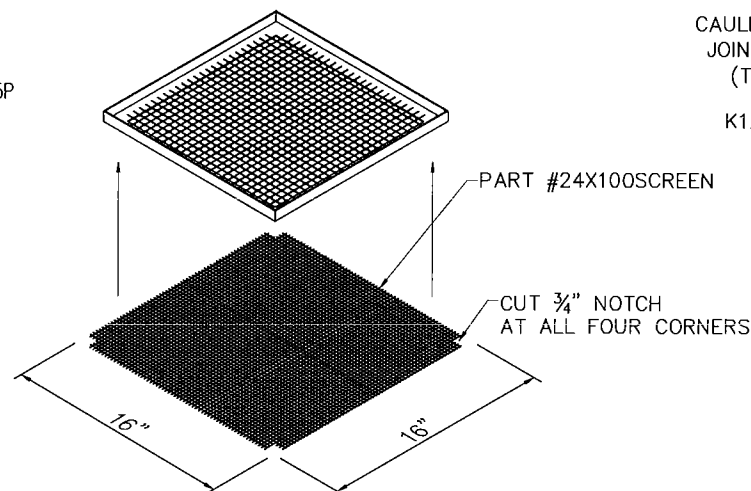


TYPICAL SECTION @ PANEL CONNECTOR

OPTIONAL WEATHERHOOD INSECT SCREEN

AN INSECT SCREEN HAS BEEN PROVIDED IN ADDITION TO THE BIRD SCREEN. (PART #24X100SCREEN)

- 1.) - CUT INSECT SCREEN TO A 16" SQUARE.
- 2.) - CUT 3/4" NOTCHES AT ALL FOUR CORNERS.
- 3.) - WRAP INSECT SCREEN AROUND BIRD SCREEN FRAME, PLACE FRAME INSIDE WEATHERHOOD PER ASSEMBLY INSTRUCTIONS PROVIDED WITH THE WEATHERHOOD AND SCREW IN PLACE USING SIX (6) K1237-1 # 12 SELF DRILLING FASTENERS THROUGH WEATHERHOOD INTO BIRD SCREEN FRAME.



REVISIONS	BY
12-05-07	RAP
05-21-08	BAS
03-22-10	JMC
06-10-10	RAP
07-28-10	RAP
03-17-11	KRK
04-08-11	KRK
11-17-11	TLC
02-24-12	TLC
12-08-15	JMC

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PHONE: 800-786-4855
FAX: 304-586-3842
ENGINEER: TOM HARDING
THARDING@PARKLINE.COM

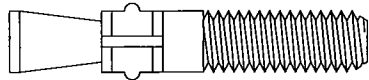


**'12" GREENHECK'
EXPLOSION PROOF
EXHAUST FAN**

INSTALLATION DETAILS

DATE	11-02-07
DRAWN BY	RAP
SCALE	NTS
ORDER NO.	
REVISION	11

FAN-12XP-1



K2026A (SHOWN)

$\frac{3}{8}$ " X 2 $\frac{1}{4}$ " WEDGE ANCHOR

K2026B

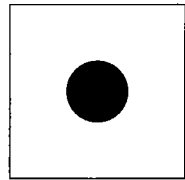
$\frac{1}{2}$ " X 4 $\frac{1}{4}$ " WEDGE ANCHOR

K2026C

$\frac{1}{2}$ " X 7" WEDGE ANCHOR

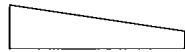
K2026D

$\frac{3}{8}$ " X 5" WEDGE ANCHOR



K2027BW

1 $\frac{1}{4}$ " X 1 $\frac{1}{4}$ " BEVELED WASHER
FOR K2027A 'J' BOLT



K1100A

$\frac{3}{8}$ " RECTANGULAR NUT



SDF14375PF4

$\frac{1}{4}$ " X 3 $\frac{3}{4}$ " SELF DRILLING
PHILLIPS HEAD FASTENER



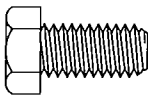
KSDF10X58SQP

10-16 X $\frac{5}{8}$ " "CONCEALED"
SELF DRILLING, PHILLIPS PANCAKE HEAD
DP3, ZINC



K1414ST

$\frac{1}{4}$ " X 1" SELF TAPPING
FASTENER

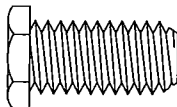


K1100B (SHOWN)

$\frac{3}{8}$ " X $\frac{3}{4}$ " RIB BOLT

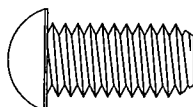
K1100C

$\frac{3}{8}$ " X 1 $\frac{1}{2}$ " HEX BOLT



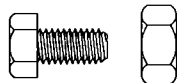
K2028

$\frac{1}{2}$ " X 1" LOW HEAD BOLT
WITH NUT



K2028BH

$\frac{1}{2}$ " X 1 $\frac{1}{2}$ " BUTTON
HEAD CAP BOLT



K783CS42

$\frac{1}{4}$ " X $\frac{1}{2}$ " MACHINE SCREW
WITH KHN14SS NUT

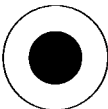


K1163

$\frac{1}{4}$ " ALUMINUM AND NEOPRENE WASHER

K1164

$\frac{1}{2}$ " STEEL AND NEOPRENE WASHER



K190-4

$\frac{3}{8}$ " WASHER

FW12P

$\frac{1}{2}$ " WASHER

FW34P

$\frac{3}{4}$ " WASHER

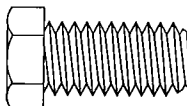


K1237

#12 X $\frac{3}{4}$ " ZINC SELF-DRILLING FASTENER
WITHOUT WASHER

K1238

#12 X $\frac{3}{4}$ " PAINTED SELF-DRILLING FASTENER
WITHOUT WASHER



K1161H1

$\frac{1}{2}$ " X 1" HEX BOLT

K1161H3

$\frac{1}{2}$ " X 1 $\frac{1}{2}$ " HEX BOLT

K1161H8

$\frac{1}{2}$ " X 4" HEX BOLT

K1161H1SS

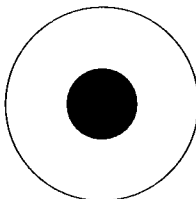
$\frac{1}{2}$ " X 1" STAINLESS STEEL HEX BOLT

K1161H1.5SS

$\frac{1}{2}$ " X 1 $\frac{1}{2}$ " STAINLESS STEEL HEX BOLT

K1158H3

$\frac{3}{8}$ " X 1 $\frac{1}{2}$ " HEX BOLT

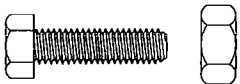


K12RW

$\frac{1}{2}$ " I.D. X 1 $\frac{1}{8}$ " O.D.
COTTON REINFORCED
RUBBER WASHER

K34RW

$\frac{3}{4}$ " I.D. X 2 $\frac{1}{4}$ " O.D.
COTTON REINFORCED
RUBBER WASHER



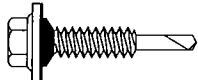
K2029A

$\frac{1}{4}$ " X 1" MACHINE SCREW
WITH HN14G5P NUT



K1324

#8 X $\frac{5}{8}$ " SELF-DRILLING FASTENER, PAINTED
NO SUFFIX = ARCTIC WHITE
DT = DESERT TAN



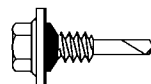
K1237-1

#12 X 1" FASTENER
WITH WASHER



K1237-6

#12 X 1 $\frac{1}{4}$ " HWH
SELF-DRILLING FASTENER 'TEK-5'



K1235

1/4 -14 X 1" TEK-1 HEX HEAD SELF
DRILLING FASTENER WITH WASHER
(WASHER OPTIONAL) PROTECTIVE FINISH

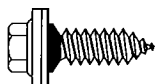


K1324WP

#8 X $\frac{3}{4}$ " PHILLIPS WAFER HEAD
SELF DRILLING FASTENER, PAINTED WHITE

K1324WP-FRP

#8 X 1 $\frac{1}{8}$ " PHILLIPS WAFER HEAD
SELF DRILLING FASTENER, PAINTED WHITE
(USED ON FRP LINER SYSTEM ONLY)



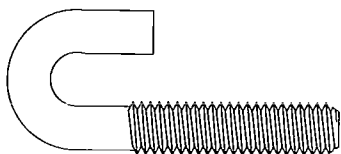
K1434

#14 X $\frac{3}{4}$ " ROOF SCREW
WITH WASHER



SDF12114AW

#12 SELF-DRILLING FASTENER
1 $\frac{1}{4}$ " LONG - PAINTED ARCTIC WHITE



K2027A

$\frac{3}{8}$ " 'J' BOLT



HN12G8P

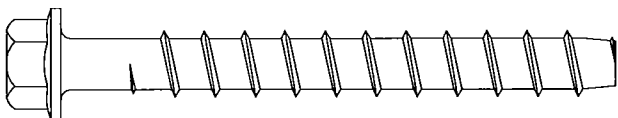
$\frac{1}{2}$ " HEX NUT, GRADE 8

HN12P

$\frac{1}{2}$ " HEX NUT, GRADE 5

HN12NIP

$\frac{1}{2}$ "-13 NYLON INSERT HEX NUT

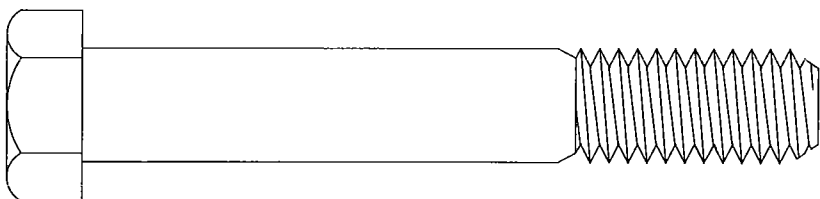


TSA 384 (SHOWN)

$\frac{3}{8}$ " X 4" TITEN HD ANCHOR

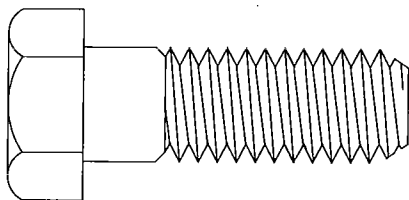
TSA 125

$\frac{1}{2}$ " X 5" TITEN HD ANCHOR



HB34X512

$\frac{3}{4}$ " X 5 $\frac{1}{2}$ " BOLT



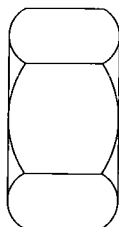
K895H605

$\frac{3}{4}$ " X 2 $\frac{1}{2}$ " BOLT



K185-3

$\frac{3}{8}$ " HEX NUT



HN34C

$\frac{3}{4}$ " HEAVY HEX NUT,
GRADE C

REVISIONS	BY
2-25-99	DLR
12-06-00	DLR
06-27-03	RAP
01-27-05	CBP
10-07-05	RAP
12-06-05	CBP
11-07-06	BHKJ
11-17-08	CEM
09-27-11	KRK
10-21-16	JMC

PARKLINE, INC.
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FAX: 304-586-3842



**BUILDING HARDWARE
IDENTIFICATION**

FASTENERS

DATE 10-7-93

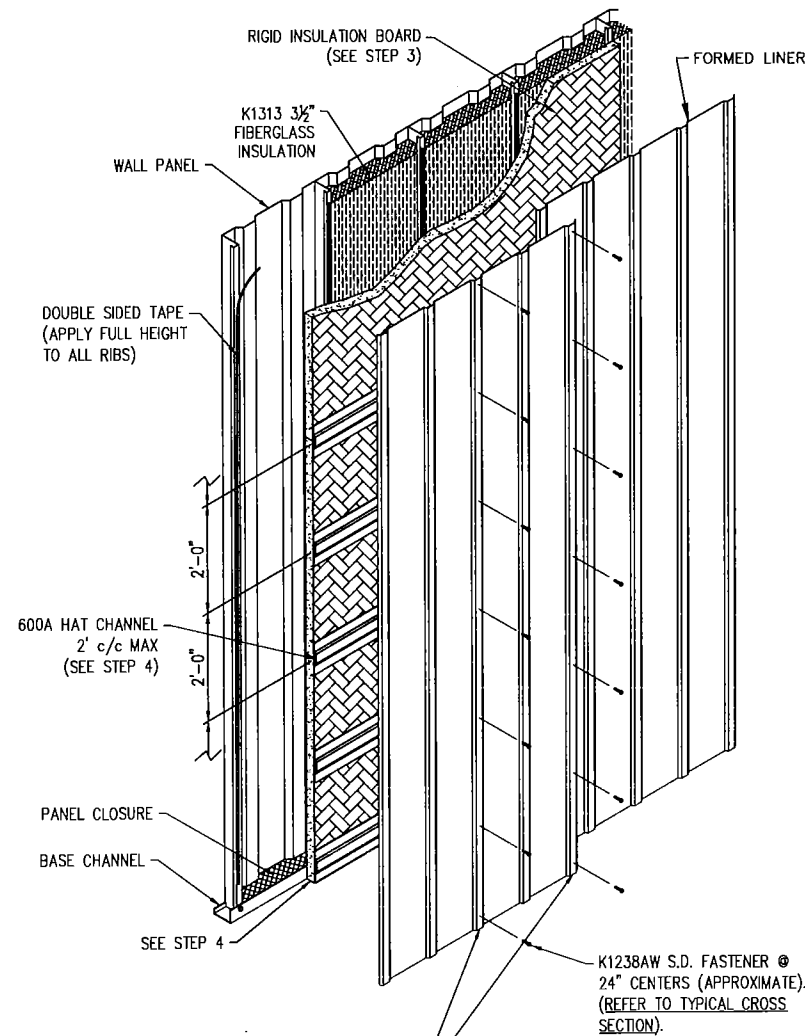
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SCALE NTS

ORDER NO.

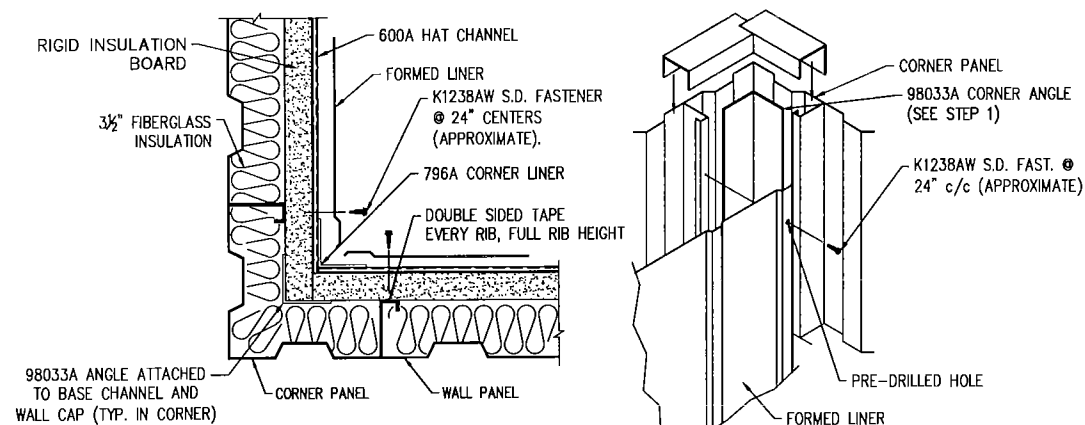
REVISION 20

FAST-D-1



NOTE:
PRE-DRILL RIB AT EDGE OF PANEL AND MIDDLE RIB WITH
1/8\"/>

WARNING:
CARE MUST BE TAKEN WHEN INSTALLING THE FASTENERS
AT CORNERS TO AVOID CRUSHING OF LINER PANEL RIB.



CORNER DETAIL

INSTALLATIONS

NOTES:

1. INSTALL CEILING PRIOR TO INSTALLATION OF LINER. SEE CEILING DETAIL DRAWING FOR MORE DETAILS.
2. A 5/32\"/>

STEP 1 FIELD CUT 98033A 2 1/2\"/>

STEP 2 INSULATE ALL PANELS, SPACERS JAMBS, FRAMED OPENING JAMBS AND HEADS WITH K1313 FIBERGLASS INSULATION

STEP 3 APPLY DOUBLE SIDED TAPE (APPLY FULL HEIGHT TO ALL RIBS)

STEP 4 SEE DWG # AT-2 FOR SEALING AND TAPING OF JOINTS AND EDGES

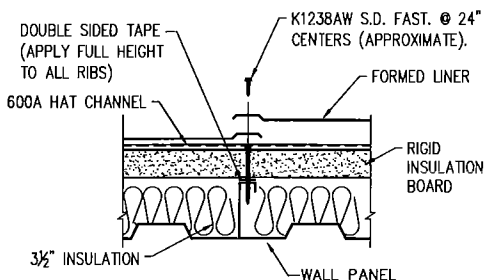
STEP 5 FIELD CUT AND INSTALL 4' x 8' RIGID INSULATION BOARD SHEETS HORIZONTALLY AGAINST DOUBLE SIDED TAPE, FIELD CUT AS REQUIRED

STEP 6 ATTACH 600A HAT CHANNELS W/ K1237-3AW #12 x 3\"/>

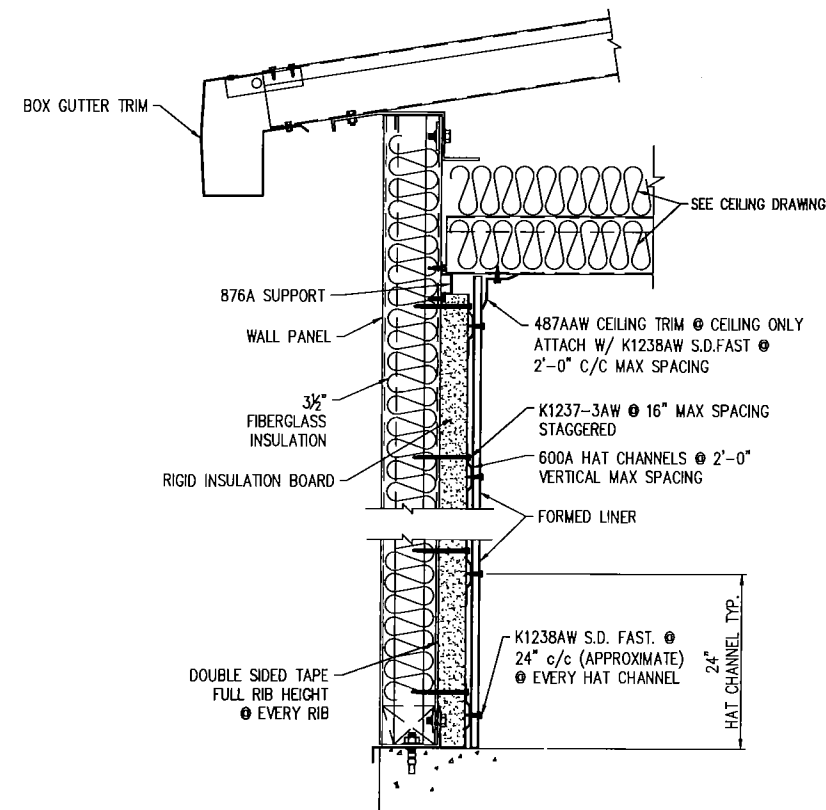
STEP 7 FIELD CUT CORNER LINER TO LINER LENGTH. INSTALL CORNER LINE FIRST. ATTACH WITH K1238AW #12 x 3\"/>

STEP 8 INSTALL LINER, STARTING IN ANY CORNER, AND WORKING AROUND THE BUILDING, LAPPING SHEETS. FASTEN TO 600A HAT CHANNELS AT 16\"/>

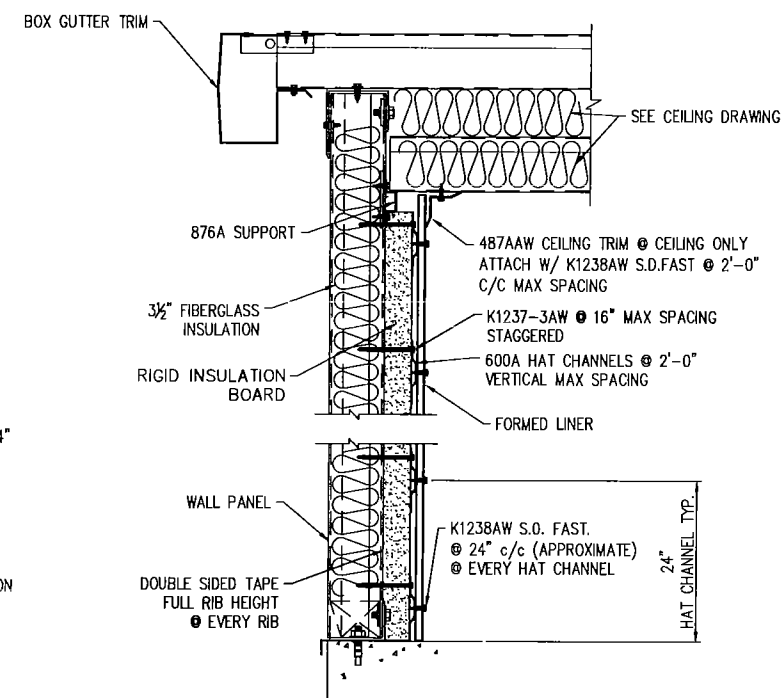
STEP 9 INSTALL 487AAW TRIM AT LINER TO CEILING CONNECTION ON ALL WALLS. FIELD CUT TO LENGTH AND ATTACH TRIM TO LINE PANELS W/ K1238AW #12 x 3/4\"/>



TYPICAL LINER LAP DETAIL



**TYPICAL CROSS SECTION
TYPE 'AL' BUILDING**



**TYPICAL CROSS SECTION
TYPE 'S' BUILDING**

NOTE:
SEE DRAWING # AT-2 FOR
BUILDINGS REQUIRING
AIR TIGHT SYSTEMS

REVISIONS	BY

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**INSTALLATION DETAILS FOR
FORMED WALL LINER
W/ RIGID INSULATION BOARD**

DETAIL

JOB DESCRIPTION

DATE 2/7/17

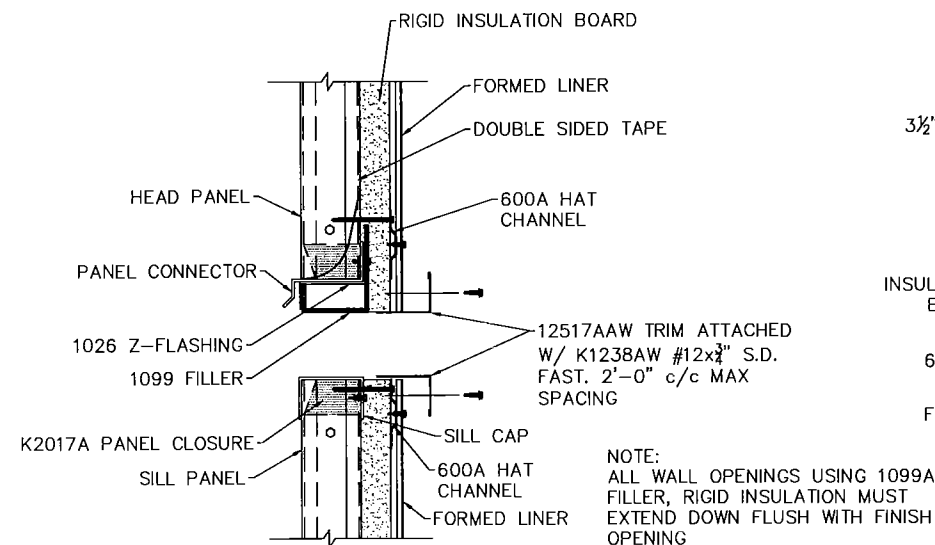
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SCALE NTS

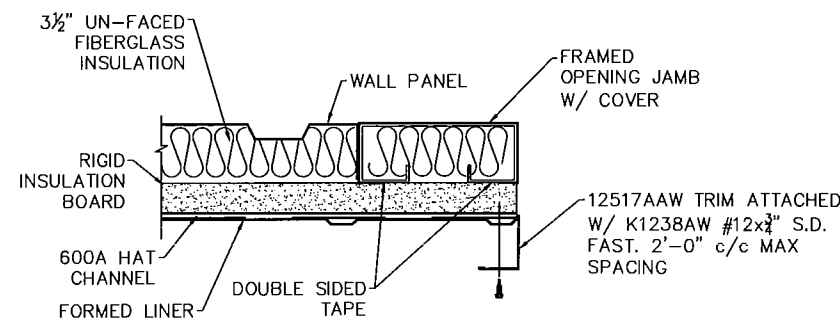
ORDER NO.

REVISION 0

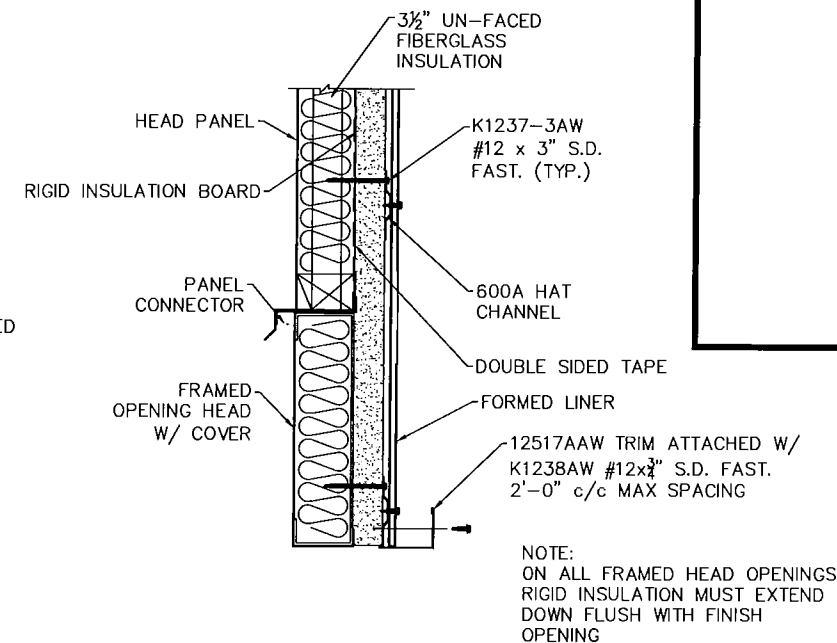
FLT-1



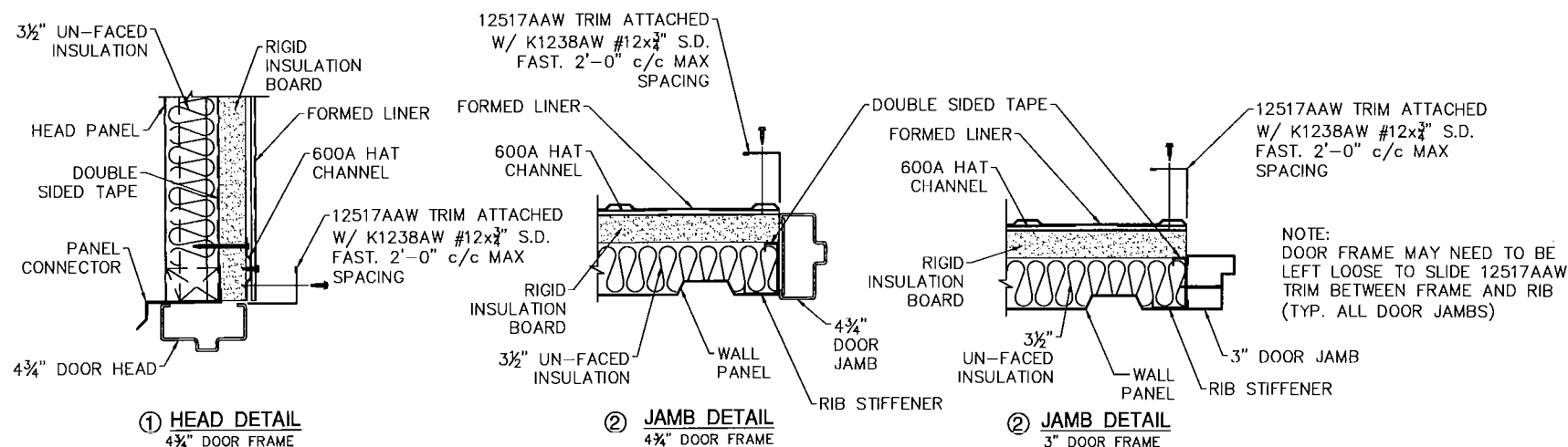
⑨ WALL OPENING DETAIL



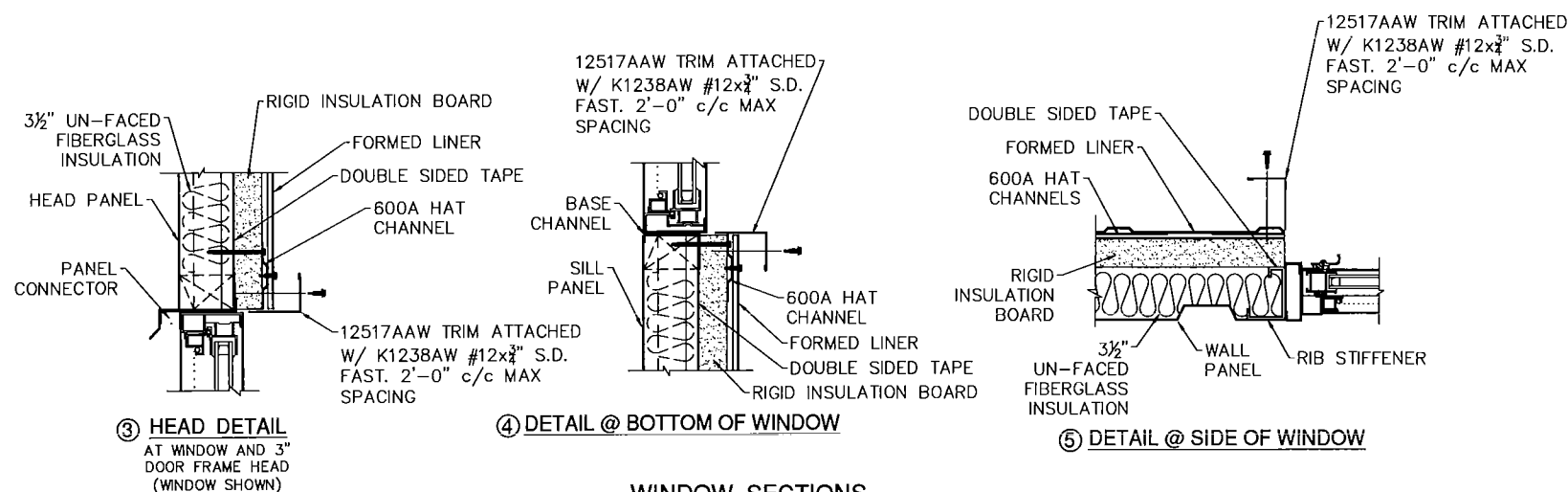
⑦ FRAMED OPENING JAMB DETAIL



⑥ FRAMED OPENING HEAD DETAIL
WITH HEAD LESS THAN EAVE HEIGHT



WALK DOOR SECTIONS



WINDOW SECTIONS

HORIZONTAL SLIDER SHOWN
SIMILAR FOR FIXED WINDOWS, WALL OPENING KITS AND LOUVERS

INSTALLATION

(CONTINUED FROM DRAWING # FLT-1)

STEP 10 INSTALL TRIM AT FRAMED OPENINGS, DOORS AND WALL OPENINGS.
NOTE: TRIM IS PROVIDED IN STOCK LENGTHS FIELD CUTTING OR SPLICING MAY BE REQUIRED.

NOTE:

1. LINER EXTENDS TO FINISH FLOOR, NO BASE TRIM REQUIRED
2. ALL LINER PROVIDED CLEAR HEIGHT -1/4"
3. 487AAW ANGLE TRIM PROVIDED FOR CEILING TO TRIM AROUND PERIMETER OF WALLS TO CEILING CONNECTION
4. USE 12517AAW TRIM WITH 1 1/2" AND 2" RIGID INSULATION SYSTEM AT WALK DOORS W/ 3" DOOR FRAME AND ALL WALL OPENINGS. USE SAME TRIM ON 4 3/4" DOOR FRAMES BUT IN TURNED LEG WILL NEED TO BE FILED CUT BACK TO CLEAR DOOR TO WALL RIB FASTENERS.
5. IF RIGID INSULATION BOARD IS THICKER THAN 2" 12517AAW TRIM WILL HAVE TO BE REPLACED WITH DIFFERENT TRIM.
6. 5 3/4" WINDSTORM DOOR FRAMES NOT SHOWN AND REQUIRE A DIFFERENT 'Z' TYPE TRIM NOT SHOWN. SEE BILL OF MATERIAL FOR TRIM REQUIRED.
7. SEE DRAWING AT-2 FOR BUILDINGS REQUIRING AIR TIGHT SYSTEMS.

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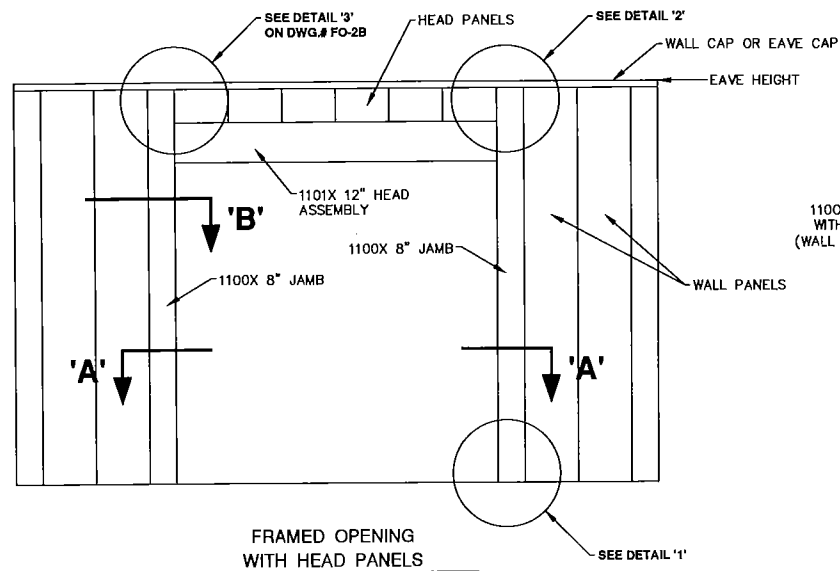
JOB DESCRIPTION
INSTALLATION DETAILS FOR
FORMED WALL LINER
W/ RIGID INSULATION BOARD

DETAIL

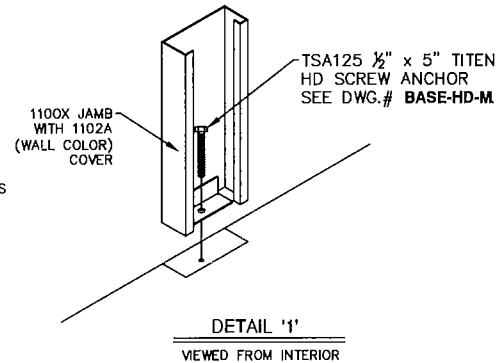
SHEET TITLE

DATE	2/8/17
DRAWN BY	SCW
SCALE	NTS
ORDER NO.	
REVISION	0

FLT-2



FRAMED OPENING
WITH HEAD PANELS
TYPE 'S' BUILDING AND
SIDE WALL OF TYPE 'AL' BUILDING

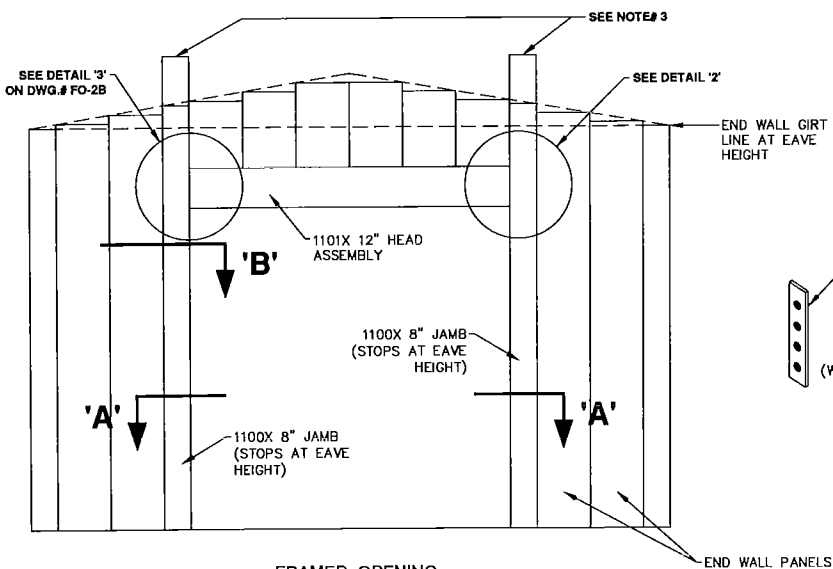


DETAIL '1'
VIEWED FROM INTERIOR

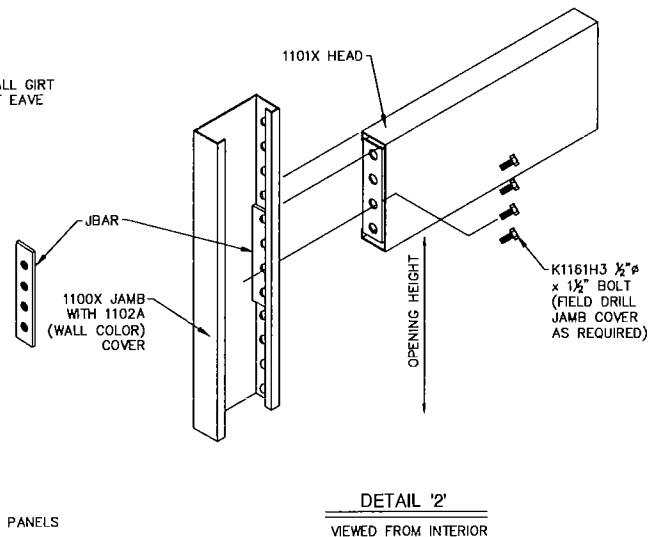
ERECTION PROCEDURE (INSTALL FRAME IN CONJUNCTION WITH WALL ERECTION)

NOTES:

1. INSTALL 1102A JAMB COVERS ON JAMBS PRIOR TO ASSEMBLY. ERECTOR MAY WISH TO TEMPORARILY ATTACH JAMB COVER TO JAMB WITH 1 OR 2 FASTENERS. THESE MUST BE REMOVED PRIOR TO INSTALLING IN WALL.
2. 1102A JAMB COVERS ARE TO BE FIELD DRILLED FOR $\frac{1}{2}$ " ϕ BOLTS AT HEAD.
3. JAMB COVERS ARE PROVIDED IN STANDARD LENGTHS ONLY. COVERS MAY REQUIRE SPLICING. IF SPLICES ARE REQUIRED, COVERS WILL BE PACKED WITH ONE INSIDE THE OTHER. TEST FIT COVERS FOR PROPER SPLICE FIT. CARE MUST BE TAKEN WHEN FIELD CUTTING COVERS TO ASSURE A CLEAN SPLICE.
4. PARKLINE RECOMMENDS THAT THE 1101X HEAD ASSEMBLY BE INSTALLED WITH FACE TOWARD INSIDE OF BUILDING. MANY TIMES THIS IS NECESSARY FOR MOUNTING OF DOOR HARDWARE HOWEVER THE HEAD ASSEMBLY CAN BE INSTALLED EITHER DIRECTION AT BUILDERS DISCRETION.
5. 1103 HEAD COVERS ARE PROVIDED 12'-0" LONG. IF OPENING WIDTH IS GREATER THAN 12'-0", THE COVERS MUST BE SPLICED. IF THE OPENING IS LESS THAN 12'-0" WIDE, FIELD CUTTING WILL BE REQUIRED. IF SPLICES ARE REQUIRED, COVERS WILL BE PACKED WITH ONE INSIDE THE OTHER. CARE MUST BE TAKEN WHEN FIELD CUTTING COVERS TO ASSURE A CLEAN SPLICE.

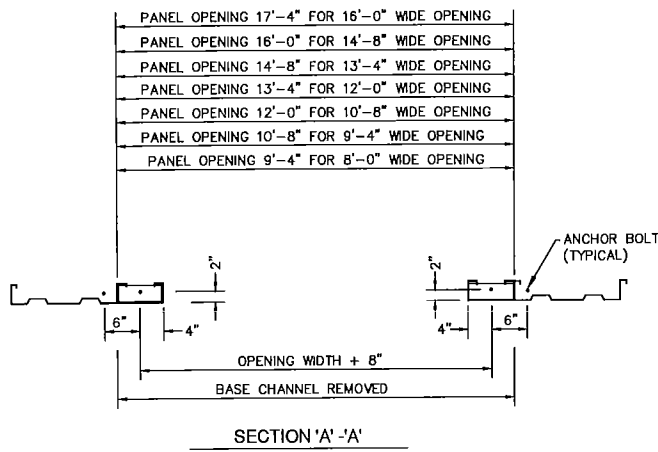


FRAMED OPENING
IN END WALL OF TYPE 'AL' BUILDING

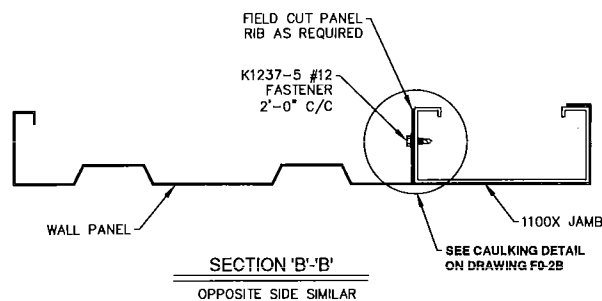


DETAIL '2'
VIEWED FROM INTERIOR

- STEP 1** INSTALL TSA125 $\frac{1}{2}$ " x 5" TITEN HD SCREW ANCHOR PER SECTION 'A'-A'.
- STEP 2** DETERMINE THE HEIGHT OF THE OPENING AND DRILL JAMB COVERS FOR $\frac{1}{2}$ " ϕ BOLTS USING HOLES IN JAMB FOR LOCATIONS.
- STEP 3** INSERT JBAR PLATE IN JAMB AT HEAD LOCATION. (SEE DETAIL '2') ATTACH HEAD TO JAMB WITH (4) K1161H3 $\frac{1}{2}$ " ϕ BOLTS. TYPICAL BOTH SIDES. FLAT SIDE (WEB) OF HEAD SHOULD FACE THE INTERIOR OF THE BUILDING. (SEE NOTE #4 ABOVE)
- STEP 4** INSTALL 1103A HEAD COVER(S) ON HEAD. (HEAD COVERS MAY BE INSTALLED AFTER FRAME IS IN PLACE).
- STEP 5** CAULK WALL PANELS PER CAULKING DETAIL ON DRAWING FO-2B.
- STEP 6** TILT ASSEMBLED FRAME INTO PLACE. INSTALL WASHERS AND NUTS ON ANCHOR BOLTS. BE SURE FRAME IS SQUARE AND PLUMB AND FASTEN THRU WALL PANEL RIBS INTO JAMB w/K1237-5 #12 FASTENERS AT 24" c/c (SEE SECTION 'B'). (NOTE: MAKE SURE JAMB COVER IS IN TIGHT AGAINST JAMB PRIOR TO INSTALLING FASTENERS).
- STEP 7** PLACE 993A PANEL CONNECTOR AND 'Z' FLASHING ON TOP OF HEAD ASSEMBLY AND FASTEN WITH K1237-1 #12 FASTENERS W/ WASHER AT 8" C/C. SEAL ALL JOINTS WITH K1115P SEALANT. (SEE DETAIL '3' AND NOTE ON DRAWING FO-2B).
- STEP 8** CAULK TOP OF PANEL CONNECTOR WITH K1115P. (SEE PANEL CONNECTOR CAULKING DETAIL ON DWG.# FO-2B).
- STEP 9** APPLY SEALANT TO JAMBS AT HEAD PANEL RIBS AS SHOWN (SEE DETAIL '3' ON DRAWING FO-2B) AND INSTALL HEAD PANELS INTO PANEL CONNECTOR. SWEEP CAULK EACH HEAD PANEL RIB.
- STEP 10** TYPE S BUILDING:
INSTALL WALL CAP. FASTEN TO TOP OF HEAD PANELS PER STANDARD DETAILS. FIELD DRILL RIBS OF JAMBS TO ATTACH WALL CAP WITH K1100 $\frac{3}{8}$ " ϕ BOLTS.
- TYPE AL BUILDING:
AT EAVE CAP (SIDE WALL) OR END WALL GIRT (END WALL), FASTEN TO TOP OF HEAD PANELS PER STANDARD DETAILS. FIELD DRILL RIBS OF JAMBS TO ATTACH EAVE CAP/END WALL GIRT WITH K1100 $\frac{3}{8}$ " ϕ BOLTS.
- STEP 11** FASTEN HEAD PANEL RIB TO JAMB WITH K1237-5 #12 FASTENERS @ 8" C/C (MIN. 2) AND STITCH ALL HEAD PANEL RIBS WITH 2 K1235 SCREWS. (SEE DETAIL '3' ON DRAWING FO-2B). INSTALL K2017 PANEL CLOSURES IN HEAD PANELS.
- STEP 12** ATTACH 1258A PLATE TO INSIDE FACE OF JAMBS AT HEAD HEIGHT. FASTEN WITH (4) K1237-5 #12 FASTENERS PER SIDE. TYPICAL BOTH JAMBS. (SEE DETAIL '3' ON DRAWING FO-2B).
- STEP 13** END WALL OF TYPE 'AL' BUILDING ONLY.
FIELD CUT JAMB COVERS TO MATCH SLOPE OF END WALLS.
- STEP 14** CONTINUE BUILDING ERECTION PER STANDARD DETAILS.



SECTION 'A'-A'



SECTION 'B'-B'
OPPOSITE SIDE SIMILAR

REVISIONS	BY
04-04-94	DB
01-16-95	JEH
06-05-95	JEH
01-15-96	CEM
04-29-99	DLR
01-07-03	DLR
01-11-05	WBD
08-04-10	RAP
01-19-11	TLC
05-18-16	MRW

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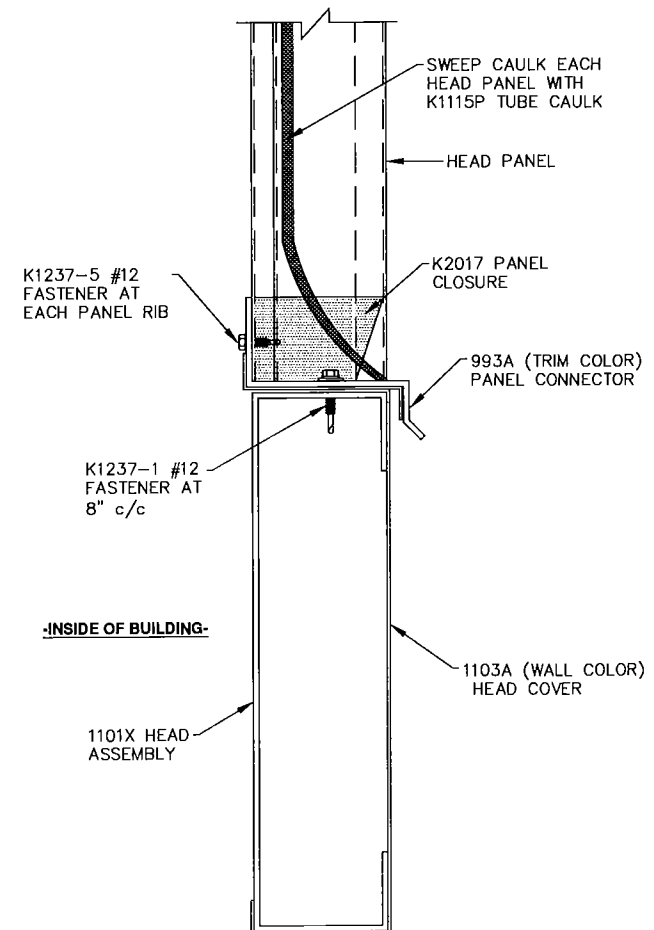


DETAILS FOR FRAMED OPENING
WITH HEAD PANELS

DETAILS

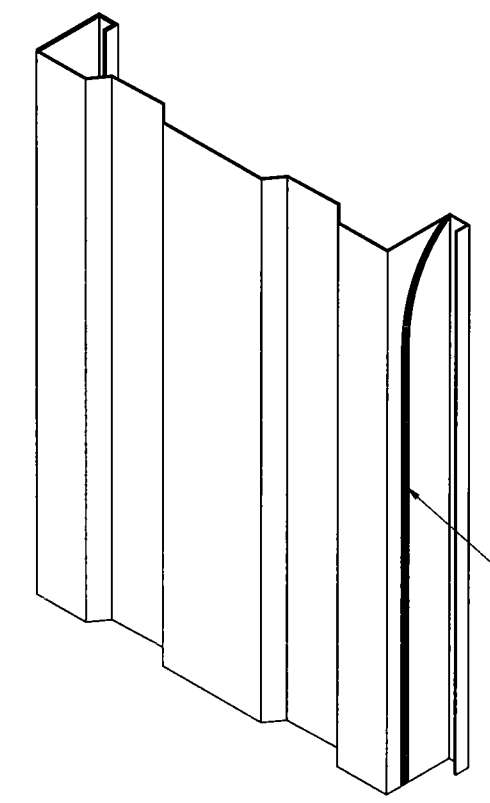
DATE	10-05-93
DRAWN BY	WS
SCALE	NTS
ORDER NO.	
REVISION	14

FO-2A

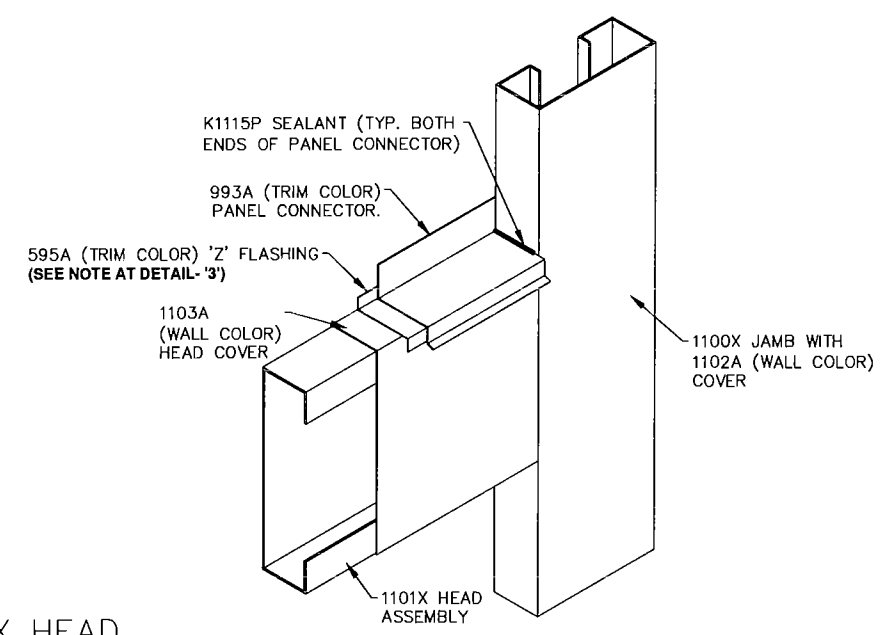


CROSS SECTION THRU HEAD ASSEMBLY

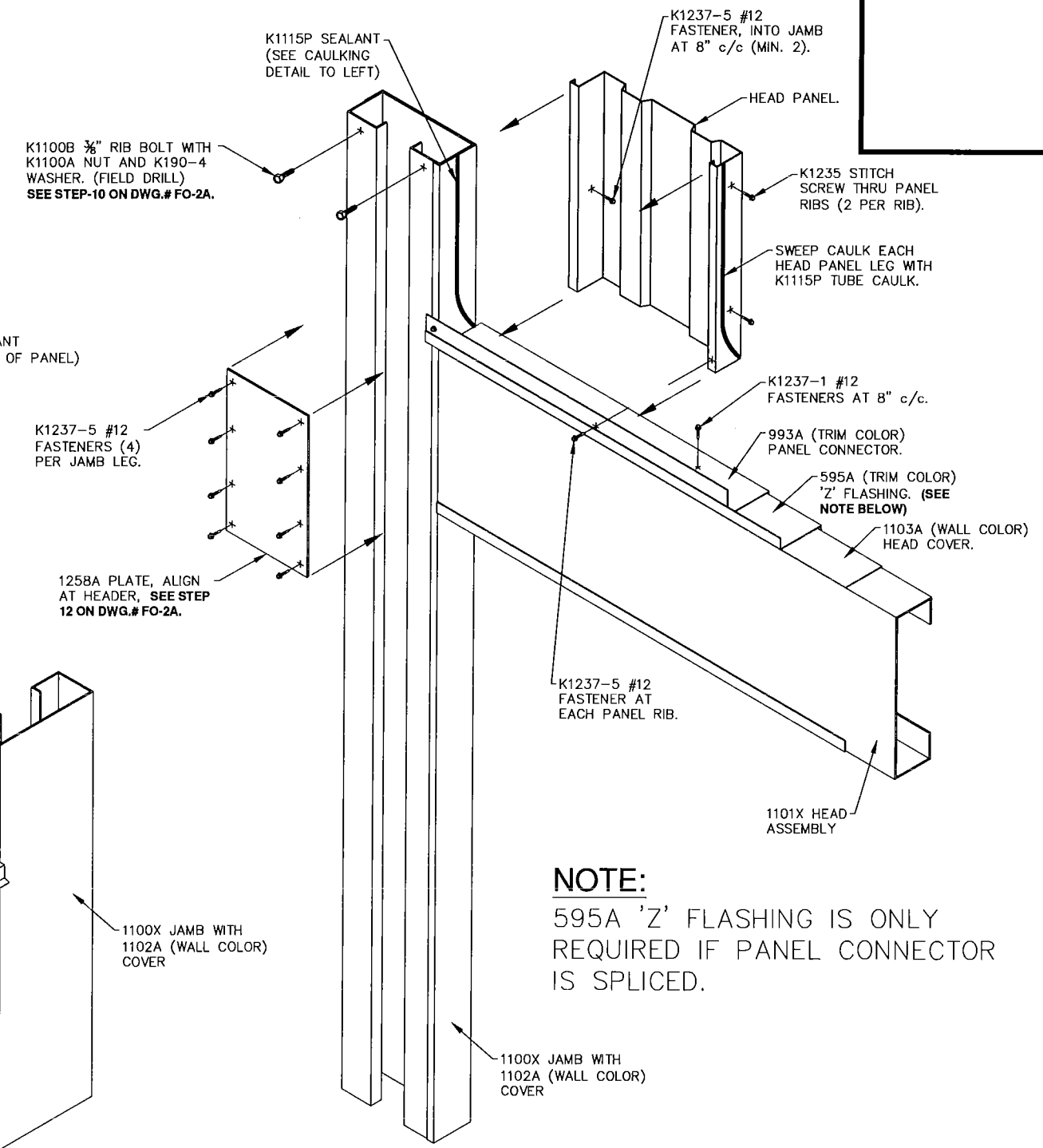
NOTE:
 PARKLINE RECOMMENDS THAT THE 1101X HEAD ASSEMBLY BE INSTALLED WITH THE FACE TOWARD THE INSIDE OF THE BUILDING. MANY TIMES THIS IS NECESSARY FOR MOUNTING OF DOOR HARDWARE, HOWEVER THE HEAD ASSEMBLY CAN BE INSTALLED IN EITHER DIRECTION AT BUILDER'S DISCRETION.



CAULKING DETAIL
 FOR WALL PANELS NEXT TO JAMBS.
 SEE STEP-5 ON DWG.# FO-2A.



PANEL CONNECTOR CAULKING DETAIL
 VIEWED FROM EXTERIOR



DETAIL - '3'
 VIEWED FROM INTERIOR

NOTE:
 595A 'Z' FLASHING IS ONLY REQUIRED IF PANEL CONNECTOR IS SPLICED.

REVISIONS	BY
03-08-94	WS
04-05-94	DB
01-16-95	JEH
06-05-95	JEH
01-15-96	CM
04-29-99	DLR
01-23-03	CBP
1-11-05	WBD
07-28-10	RAP
05-18-16	MRW

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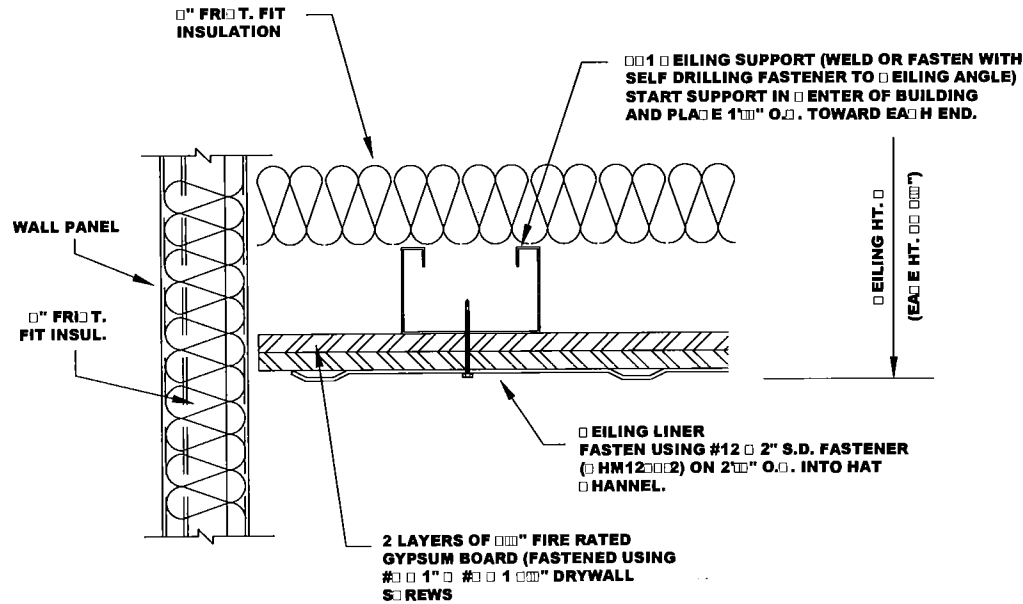


DETAILS FOR FRAMED OPENING WITH HEAD PANELS

DETAILS

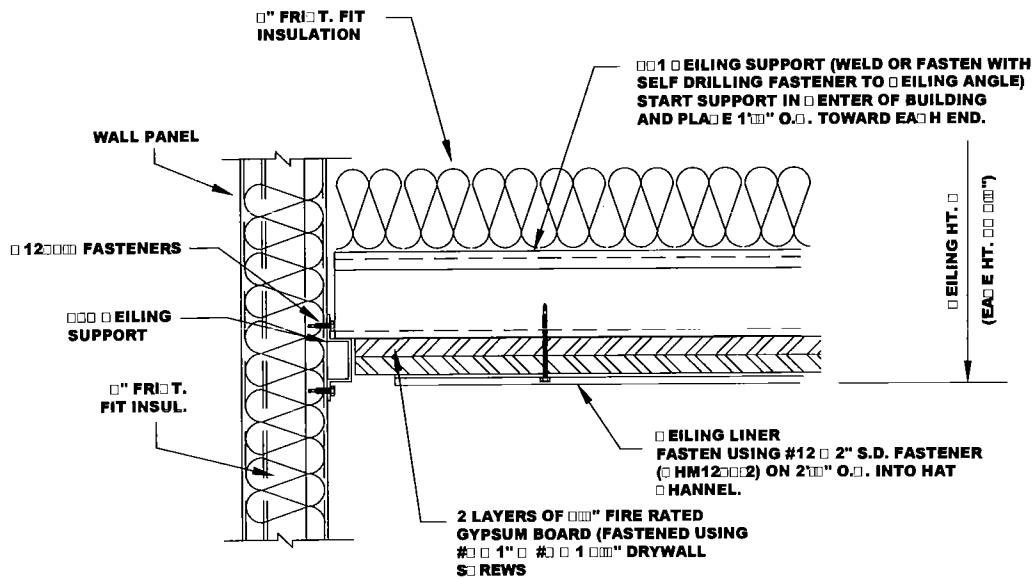
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	DRAWN BY	WS
	SCALE	NTS
	ORDER NO.	
REVISION	11	

FO-2B



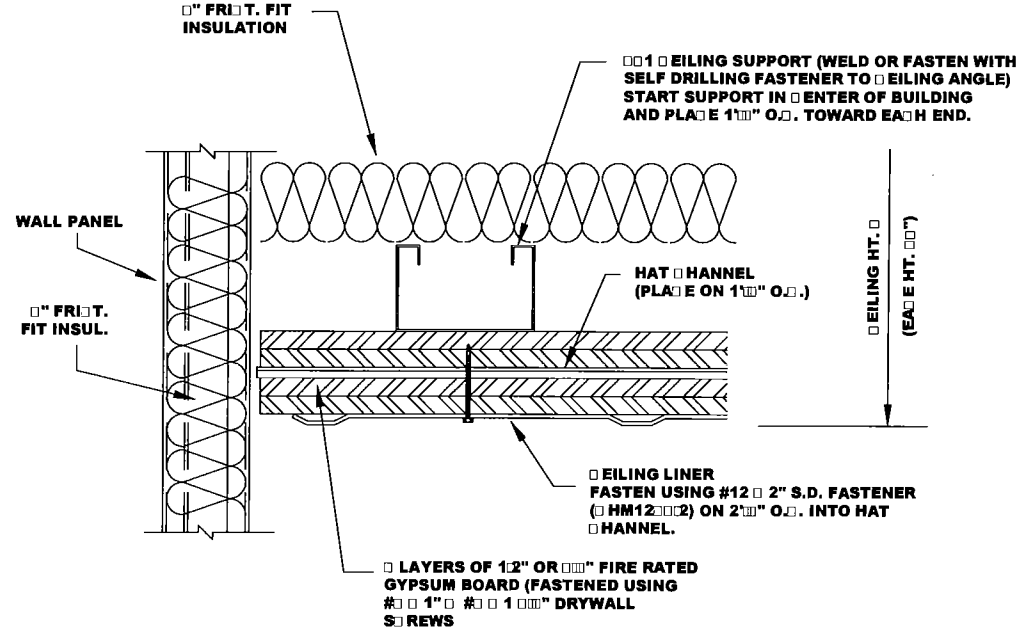
SECTION AT ENDWALL

NOTE:
EILING LINER MUST BE
INSTALLED BEFORE
INSTALLING WALL LINER.



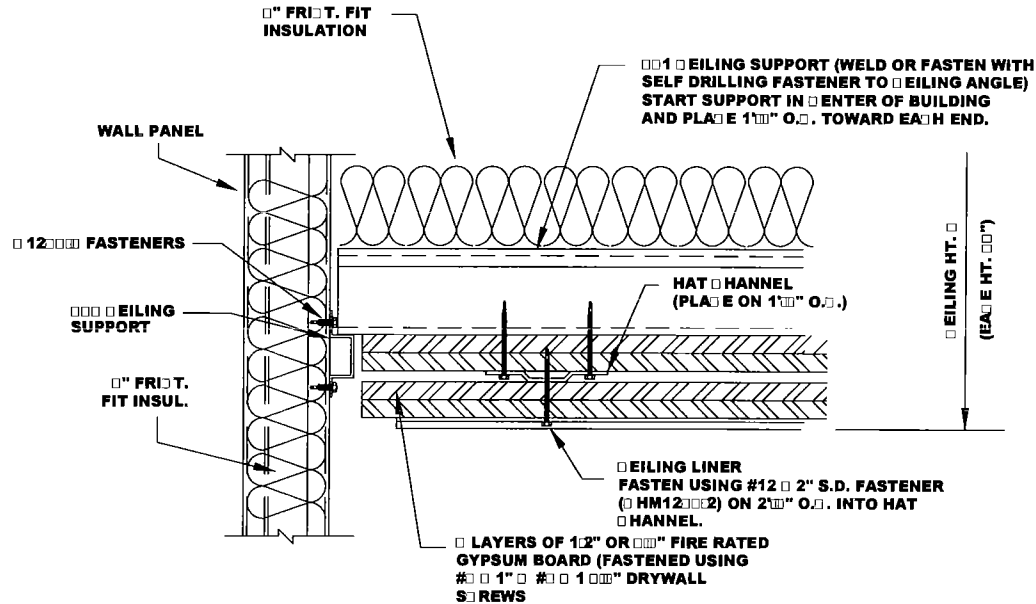
SECTION AT SIDEWALL

DETAILS FOR 1 HOUR NON-RATED EILING



SECTION AT ENDWALL

NOTE:
EILING LINER MUST BE
INSTALLED BEFORE
INSTALLING WALL LINER.



SECTION AT SIDEWALL

DETAILS FOR 2 HOUR RATED EILING

SRI PROJECT NO. 1.10000.1.000B

REVISIONS	BY
0000012	TL
000010212	R
000020212	R
0001012	BP
10022010	R
110000	TL
120000	UM
122000	MM
020000	MM

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ENGINEER: TOM HARDING
THARDING@PARKLINE.COM

FIRE CEILING DETAILS

DETAILS FOR CEILING LINER

DATE 12-30-05

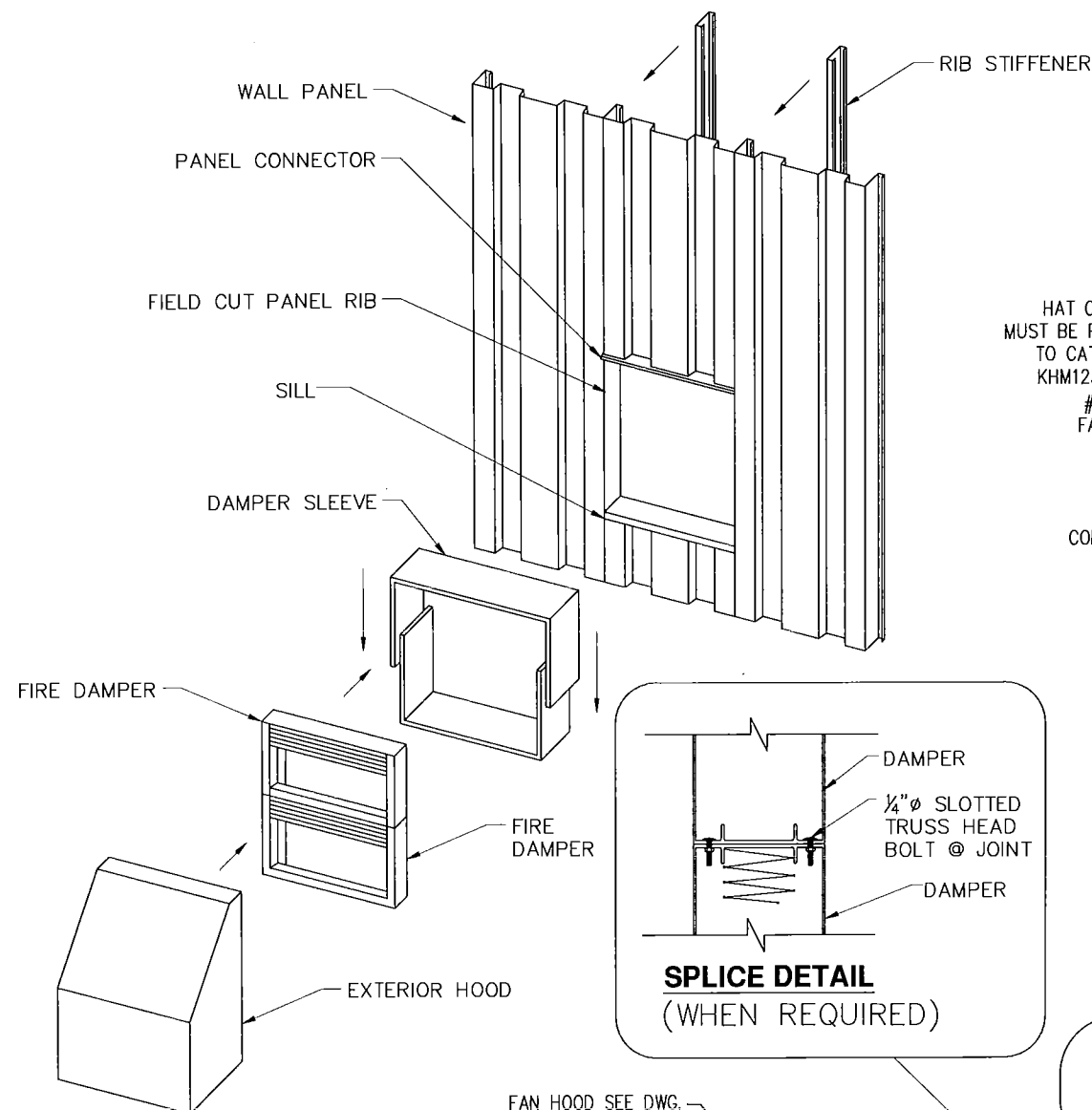
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SCALE NTS

ORDER NO.

REVISION 9

HM-CEIL



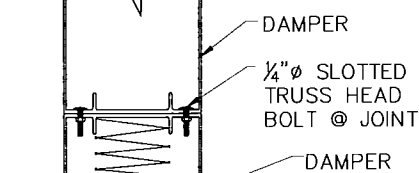
LOUVER INSTALLATION

NOTES:

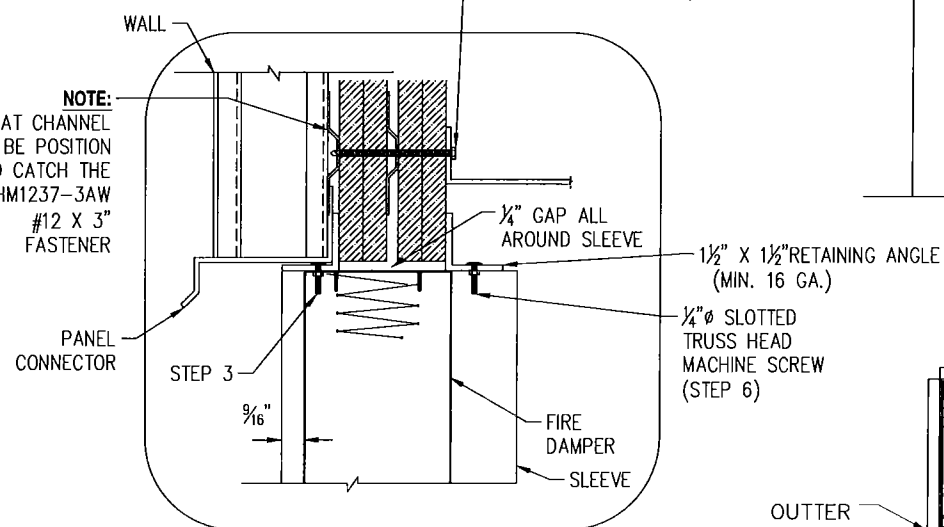
1. FRAME OUT FAN OPENING PER DWG # WOK.
2. ASSEMBLE SLEEVE/DAMPER ASSEMBLY AND PLENUM ASSEMBLIES PER DETAIL "CROSS SECTION THRU DAMPER".
3. ATTACH THE OUTER RETAINING ANGLES TO ALL 4 SIDES OF THE SLEEVE WITH $\frac{1}{4}$ " TRUSS HEAD MACHINE BOLTS WITHIN 2" OF THE CORNERS AND 6" MAXIMUM SPACING. - FIELD DRILL.
4. PLACE DAMPER SLEEVE ASSEMBLY IN WALL. (TOP RETAINING ANGLE MAY BE FASTENED TO THE PANEL CONNECTOR WITH ONE # 12 S.D. FASTENER TO ASSIST IN GYPSUM INSTALLATION).
5. INSTALL FIRE WALL PER STANDARD FIREWALL DRAWINGS. BE SURE TO MAINTAIN $\frac{1}{4}$ " GAP ALL AROUND SLEEVE.
6. USE INNER RETAINING ANGLES TO SANDWICH THE WALL TO ALLOW FOR DAMPER/SLEEVE EXPANSION DURING PERIODS OF INTENSE HEAT AND ATTACH TO SLEEVE USING THE SAME METHOD DISCUSSED IN STEP 3.
7. INSTALL PLENUM.
8. INSTALL INTERIOR LINER.
9. MOUNT THE FAN PER INSTRUCTIONS TO FAR RIGHT.

FAN HOOD SEE DWG. # FAN-HOOD (-1)

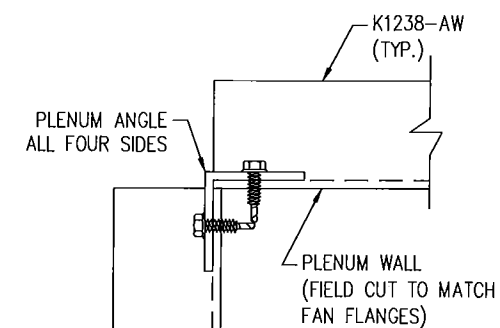
SPLICE DETAIL (WHEN REQUIRED)



NOTE:
HAT CHANNEL
MUST BE POSITION
TO CATCH THE
KHM1237-3AW
#12 X 3"
FASTENER



FASTEN TOP & BOTTOM OF
PLENUM WITH
KHM1237-3AW #12 X 3"
(**MUST** HIT HAT). FASTEN
BOTH SIDES OF PLENUM
WITH KHM1237-3AW #12 X
3" FASTENER AT 6" C/C.



DETAIL 'A'-A'

OUTTER
RETAINING
ANGLE
DAMPER
SLEEVE

COMPLETED DAMPER/SLEEVE ASSEMBLY

THREADED
ROD
NUT &
WASHER

GRILL

SLEEVED FAN ASSEMBLY
(THIS LENGTH VARIES
FROM 19" TO 30")

INSTALL ASSEMBLED
PLENUM CENTERED AROUND
DAMPER ASSEMBLY

CROSS SECTION THRU DAMPER

NOTE: Sleeved fan assembly installation for fire walls.

1. **For your safety** and easier installation, temporarily support the sleeved fan assembly at the correct height.
2. The outboard flanges are to be mounted to the plenum as shown in the detail.
3. The inboard end of the sleeved fan assembly is to be supported by $\frac{1}{4}$ " threaded rods hung from the ceiling. Attach Unistrut (or similar channel) to the equipment supports in the ceiling with at least four number 12 self-drilling screws.
4. Remove the inside grill from the fan assembly and remove the two plastic plugs from the top of the sleeve.
5. Drop threaded rods down from the Unistrut and attach to the sleeve with nuts and washers.
6. Ensure the sleeve is level, secure the nuts on the threaded rods, and reinstall the grill.

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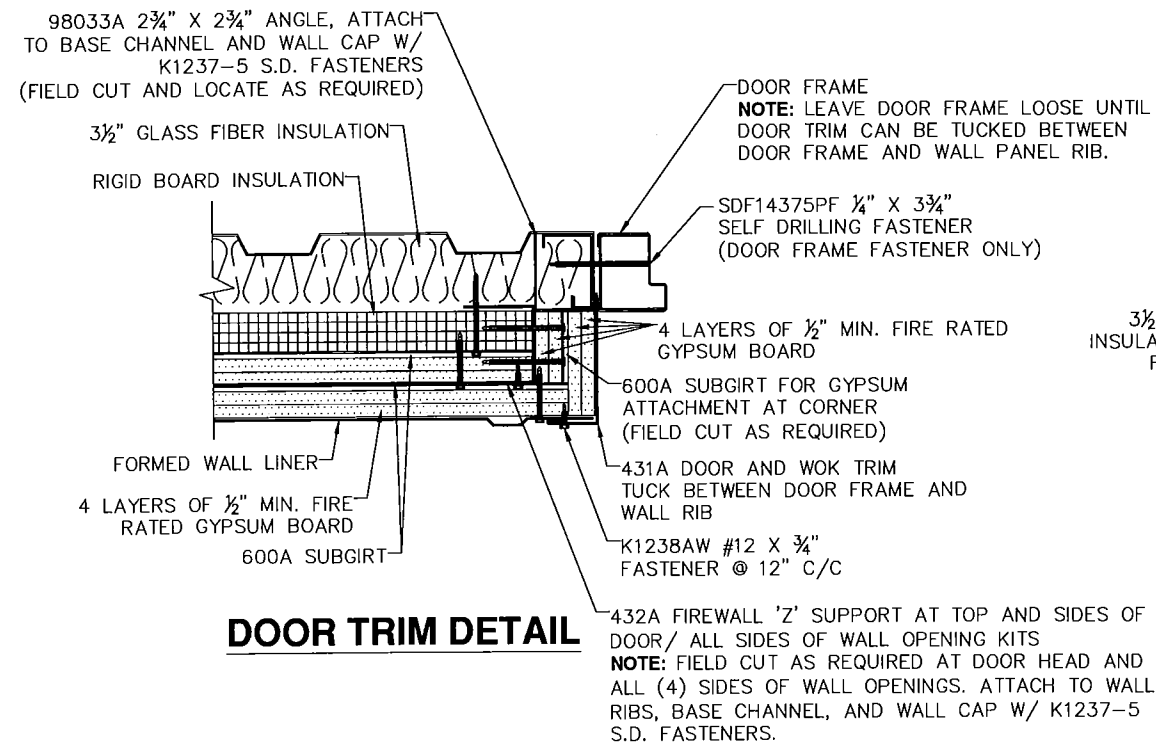


JOB DESCRIPTION
**INSTALLATION OF SLEEVED FAN
ASSEMBLY & FIRE DAMPERS IN TWO
HOUR FIRE WALL**

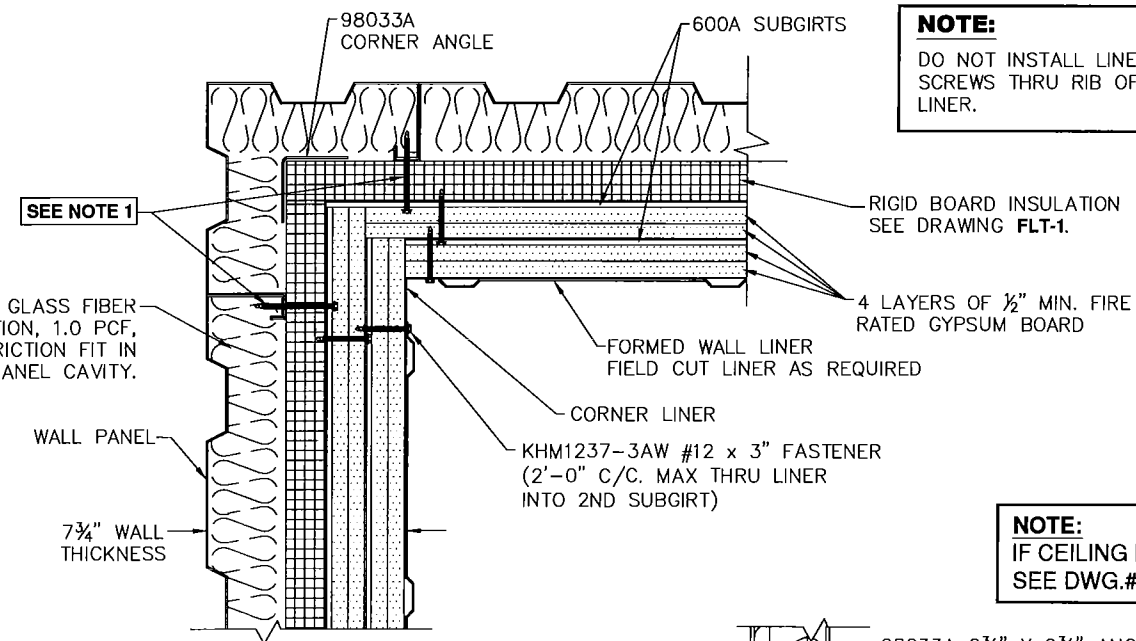
SHEET TITLE
DETAILS

DATE 09-28-16
DRAWN BY DJP
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ORDER NO.
REVISION

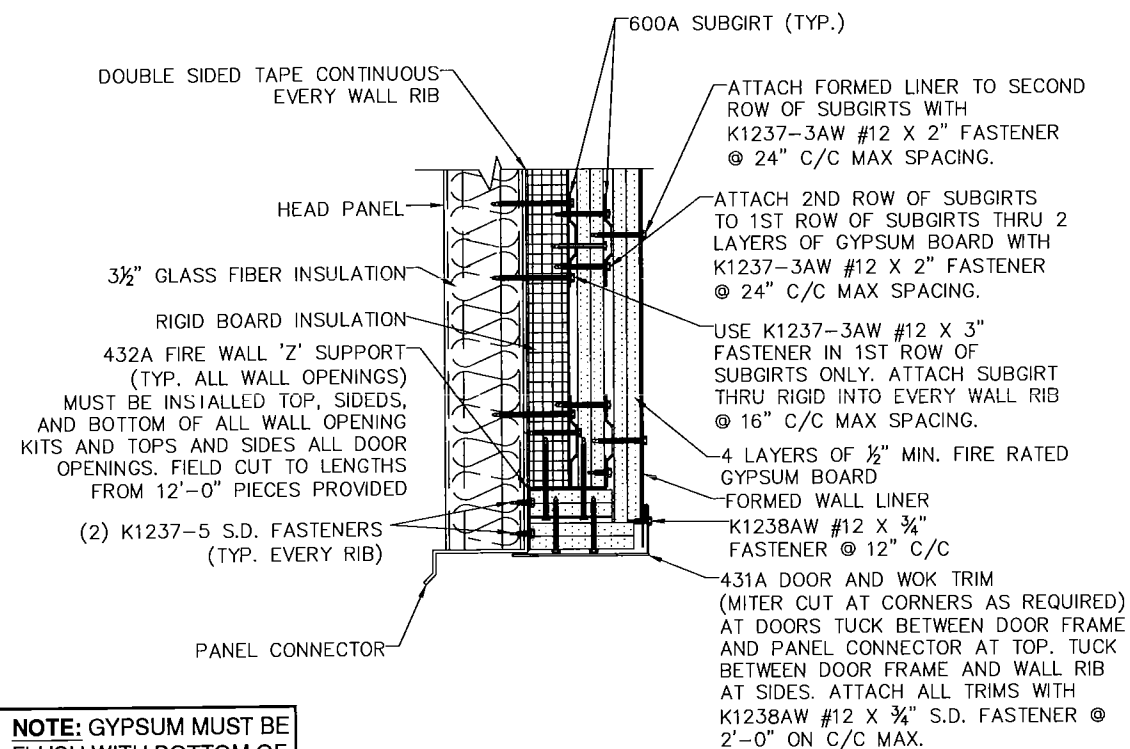
HM-FAN-2



DOOR TRIM DETAIL



TYPICAL CORNER DETAIL



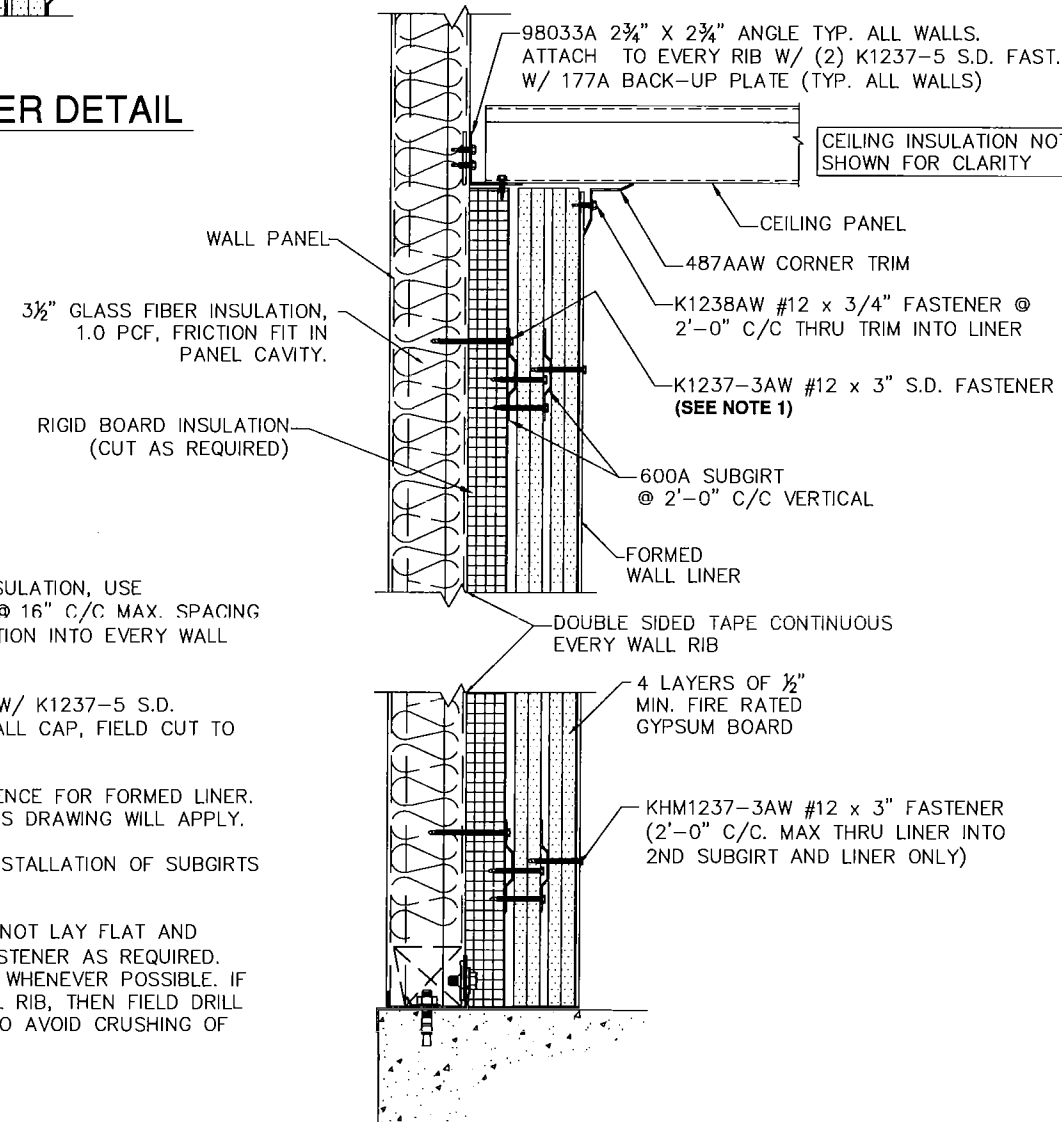
NOTE: GYPSUM MUST BE FLUSH WITH BOTTOM OF FILLER AT WALL OPENING KITS WITH 1 1/4" FILLER

TYP. OPENING DETAIL

GYPSUM IS TO BE INSTALLED IN A SIMILAR MANNER TO ALL FOUR SIDES

NOTES:

1. 1ST SUBGIRT AGAINST RIGID BOARD INSULATION, USE K1237-3AW #12 X 3" S.D. FASTENER @ 16" C/C MAX. SPACING THRU SUBGIRT & RIGID BOARD INSULATION INTO EVERY WALL PANEL RIB.
2. ALL 98033A ANGLE TO BE ATTACHED W/ K1237-5 S.D. FASTENERS TO BASE CHANNEL AND WALL CAP, FIELD CUT TO LENGTH.
3. REFER TO DRAWING FLT-1 AS A REFERENCE FOR FORMED LINER. WHERE THE TWO DRAWINGS DIFFER, THIS DRAWING WILL APPLY.
4. REFER TO DRAWING HM-FLT-FIRE FOR INSTALLATION OF SUBGIRTS AND GYPSUM BOARD.
5. IF A LAP IN THE FORMED LINER DOES NOT LAY FLAT AND TIGHT, INSTALL K1238AW #12 X 3/4" FASTENER AS REQUIRED. INSTALL FASTENER NEXT TO LINER RIB WHENEVER POSSIBLE. IF FASTENER MUST PASS THROUGH PANEL RIB, THEN FIELD DRILL HOLE, AND HAND TIGHTEN FASTENER TO AVOID CRUSHING OF LINER RIB.



TYPICAL SECTION THRU WALL

NOTE:

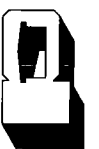
DO NOT INSTALL LINER SCREWS THRU RIB OF LINER.

NOTE:

IF CEILING IS FIRE RATED SEE DWG.# HM-CEIL

REVISIONS	BY

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328 INDUSTRIAL PARK DRIVE
ELEANOR, WY 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855
FAX: 304-566-3842

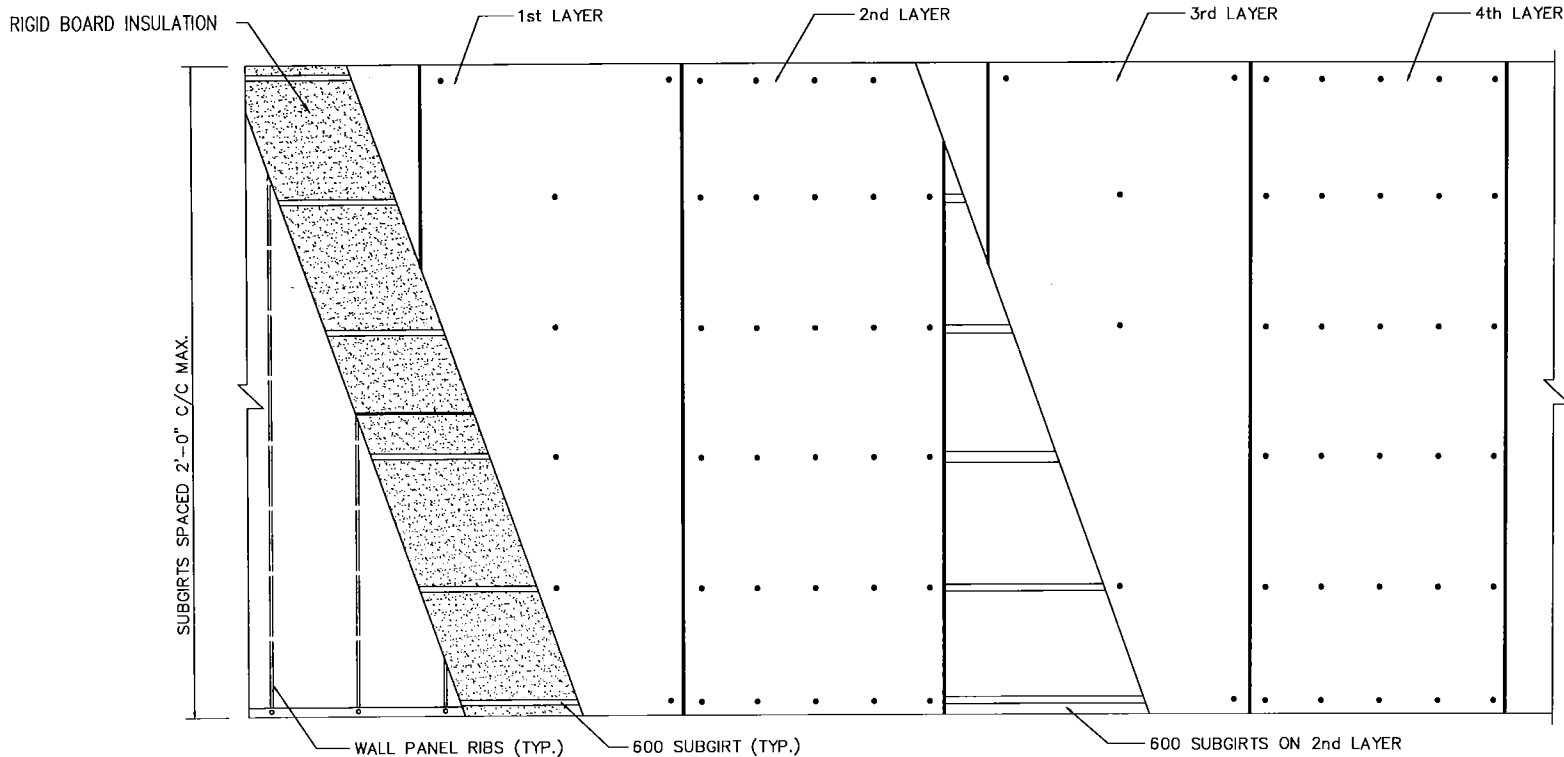


JOB DESCRIPTION
**2HR FIRE RATED WALL
W/ FORMED LINER AND
RIGID INSULATION BOARD**

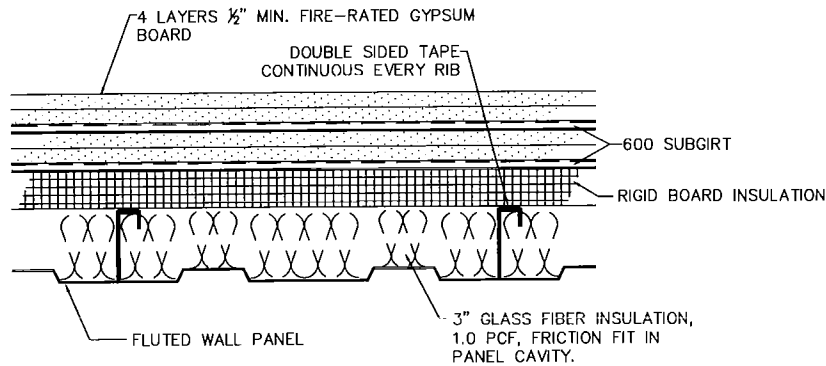
DETAIL

DATE	4-5-17
DRAWN BY	SCW
SCALE	NTS
ORDER NO.	
REVISION	0

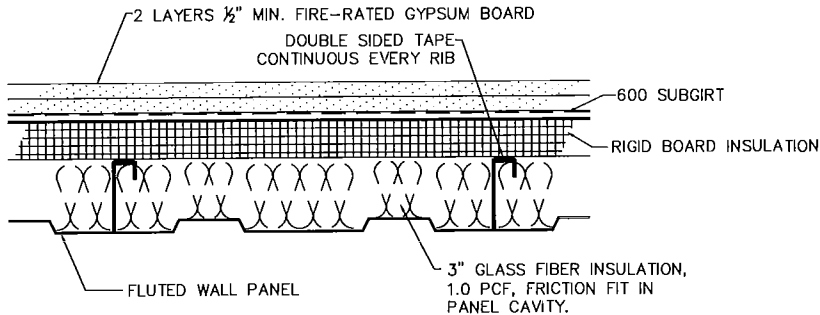
HM-FLT-2HR



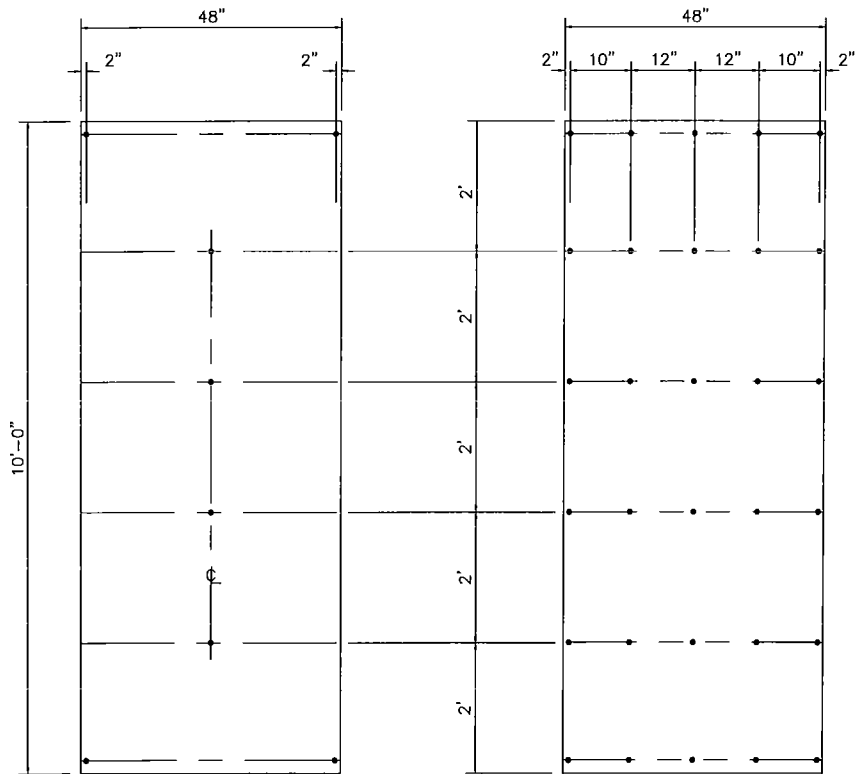
WALL ELEVATION



2 HOUR FIREWALL



1 HOUR FIREWALL



LOCATION OF SCREWS

1st & 3rd WALLBOARD LAYERS - 2 HOUR WALL

LOCATION OF SCREWS

2nd & 4th WALLBOARD LAYERS - 2 HOUR WALL

1 HOUR FIREWALL (SRI PR 1.1)

WALLBOARD IS TO BE 1/2" MINIMUM FIRE-RATED GYPSUM AND SHALL CARRY AN UNDERWRITERS' LABORATORIES LABEL (USG FIRECODE C, TYPE X OR EQUAL)

- STEP 1. INSTALL INSULATION PER FLT-1 STEPS 1 THROUGH 6 ONLY.
- STEP 2. ALL WALLBOARD IS ERECTED VERTICALLY. ATTACH THE FIRST LAYER OF WALLBOARD TO THE SUBGIRTS WITH SIX (6) KHM-DWSC #6 x 1 1/8" SELF-DRILLING DRYWALL SCREWS PER SHEET. INSTALL SCREWS 2" FROM EACH EDGE AND 24" FROM THE TOP AND BOTTOM. ALONG THE VERTICAL CENTER-LINE OF THE SHEET, INSTALL AN ADDITIONAL SCREW INTO THE TWO CENTRAL MOST SUBGIRTS (SEE DETAIL).
- STEP 3. THE SECOND LAYER OF WALLBOARD IS PLACED OVER THE FIRST WITH THE JOINTS STAGGERED 16" FROM THE FIRST LAYER. ATTACH THE WALLBOARD TO THE SUBGIRTS WITH KHM-DWSC #6 x 1 1/8" SELF-DRILLING DRYWALL SCREWS SPACED 12" O.C. ON EACH LINE SUBGIRTS (SEE DETAIL).
- STEP 4. INSTALL REQUIRED METAL WALL LINER PER DRAWING FLT-1 USING KHM1237-3AW #12 X 3" S.D. FASTENERS THRU 2 LAYERS OF WALL BOARD INTO LAST SUB-GIRT.

NOTE:
INSTALL DOUBLE SIDED TAPE, CONTINUOUS ON EVERY WALL RIB.

2 HOUR FIREWALL (SRI PR 1.1)

WALLBOARD IS TO BE 1/2" MINIMUM FIRE-RATED GYPSUM AND SHALL CARRY AN UNDERWRITERS' LABORATORIES LABEL (USG FIRECODE C, TYPE X OR EQUAL)

- STEP 1. INSTALL INSULATION PER FLT-1 STEPS 1 THROUGH 6 ONLY.
- STEP 2. ALL WALLBOARD IS ERECTED VERTICALLY. ATTACH THE FIRST LAYER OF WALLBOARD TO THE SUBGIRTS WITH SIX (6) KHM-DWSC #6 x 1 1/8" SELF-DRILLING DRYWALL SCREWS PER SHEET. INSTALL SCREWS 2" FROM EACH EDGE AND 24" FROM THE TOP AND BOTTOM. ALONG THE VERTICAL CENTER-LINE OF THE SHEET, INSTALL AN ADDITIONAL SCREW INTO THE TWO CENTRAL MOST SUBGIRTS (SEE DETAIL).
- STEP 3. THE SECOND LAYER OF WALLBOARD IS PLACED OVER THE FIRST WITH THE JOINTS STAGGERED 16" FROM THE FIRST LAYER. ATTACH THE WALLBOARD TO THE SUBGIRTS WITH KHM-DWSC #6 x 1 1/8" SELF-DRILLING DRYWALL SCREWS SPACED 12" O.C. ON EACH LINE SUBGIRTS (SEE DETAIL).
- STEP 4. INSTALL A SECOND LAYER OF SUBGIRTS HORIZONTALLY OVER THE TWO LAYERS OF WALLBOARD AND ATTACH TO THE PREVIOUS SUBGIRTS WITH KHM1237-3AW #12 X 3" SELF-DRILLING FASTENERS AT 16" O.C. OFFSET SCREWS LOCATIONS 8" FROM WALLBOARD JOINTS.
- STEP 5. PLACE THE THIRD LAYER OF WALLBOARD WITH JOINTS AT THE SUBGIRT SCREWS. ATTACH THE WALLBOARD WITH KHM-DWSC #6 x 1 1/8" SELF-DRILLING DRYWALL SCREWS SPACED THE SAME AS THE PREVIOUS LAYERS.
- STEP 6. THE FOURTH LAYER OF WALLBOARD IS PLACED WITH JOINTS STAGGERED 16" FROM THE PREVIOUS LAYER. ATTACH WITH KHM-DWSC #6 x 1 1/8" SELF-DRILLING DRYWALL SCREWS SPACED 12" O.C. ON EACH LINE OF SUBGIRTS (SEE DETAIL).
- STEP 7. INSTALL REQUIRED METAL WALL LINER PER DRAWING FLT-1 USING KHM1237-3AW #12 X 3" S.D. FASTENERS THRU 2 LAYERS OF WALL BOARD INTO LAST SUB-GIRT.

(SEE DRAWING # HM-FLT-1HR OR HM-FLT-2HR AS REQUIRED FOR ADDITIONAL DETAILS)

REVISIONS	BY

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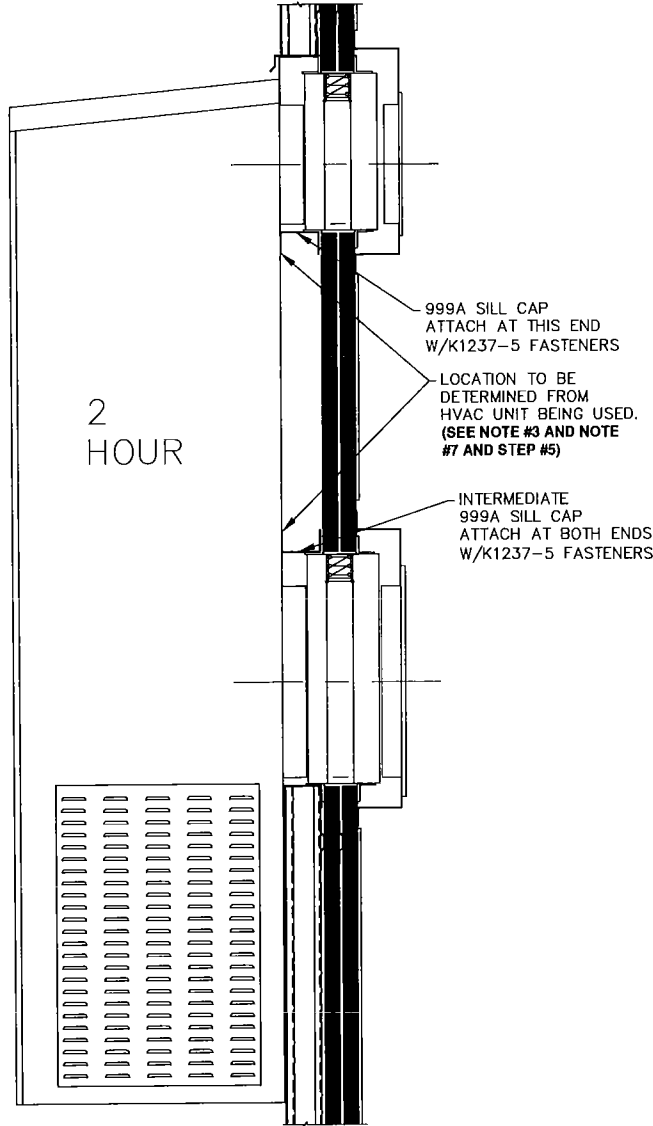


JOB DESCRIPTION	DETAILS FOR 1 AND 2 HOUR FIREWALL W/ RIGID INSULATION BOARD	SHEET TITLE	DETAIL
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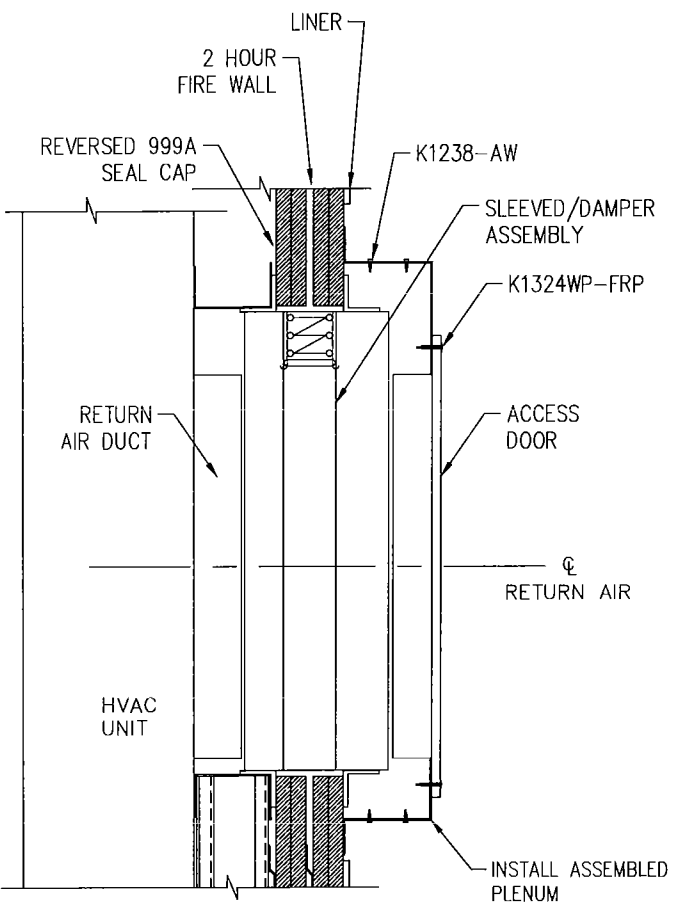
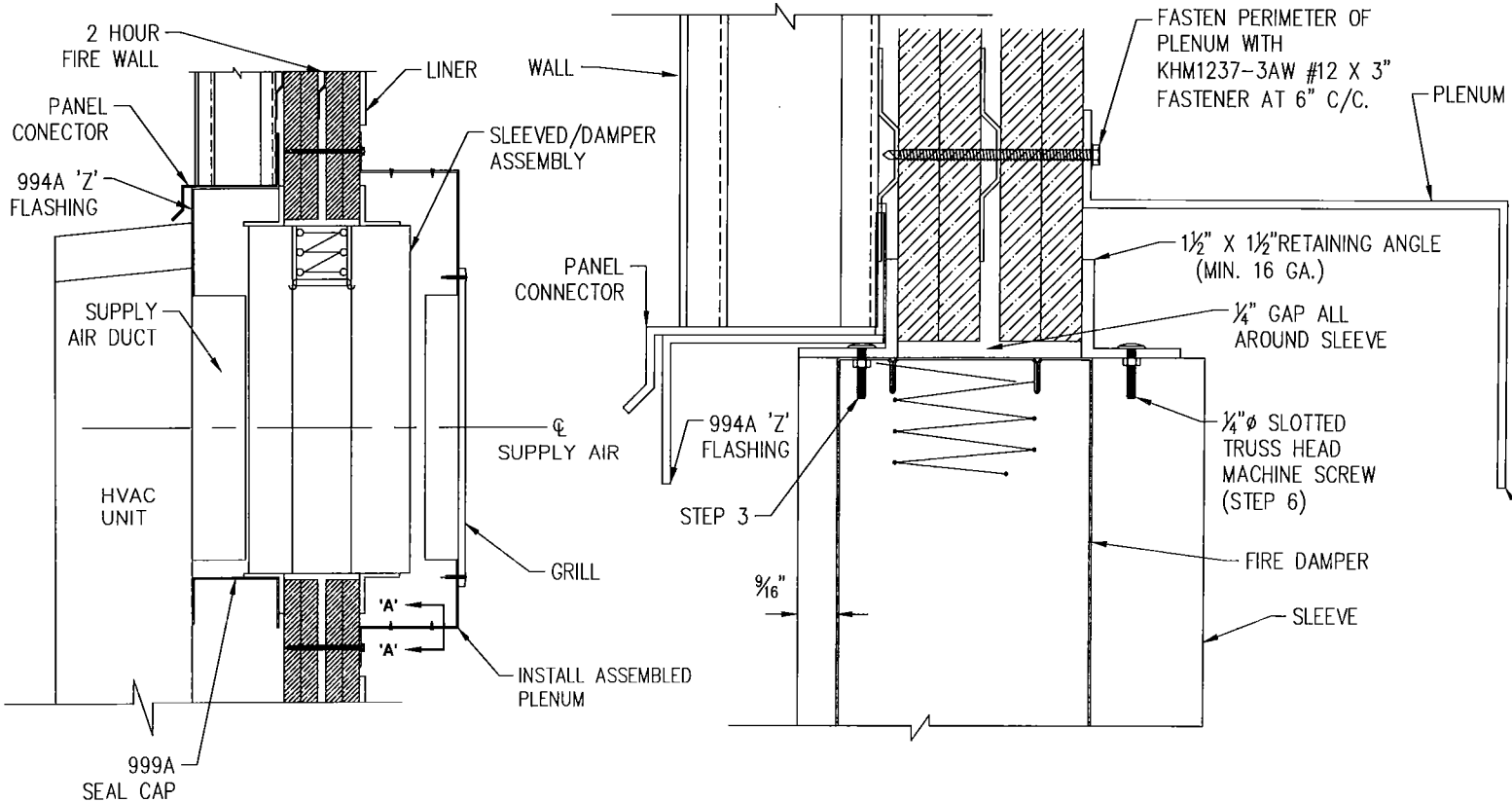
DATE	4-5-17
DRAWN BY	SCW
SCALE	NTS
ORDER NO.	
REVISION	0

HM-FLT-FIRE

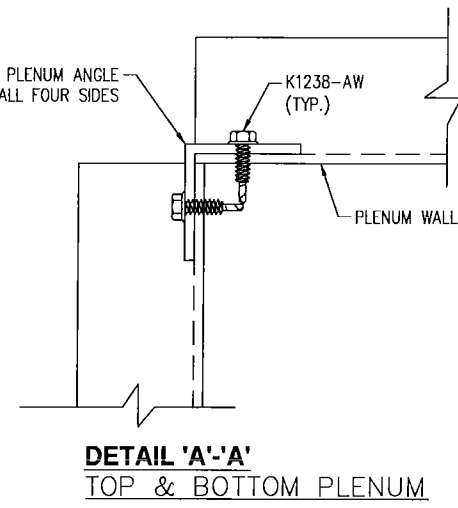
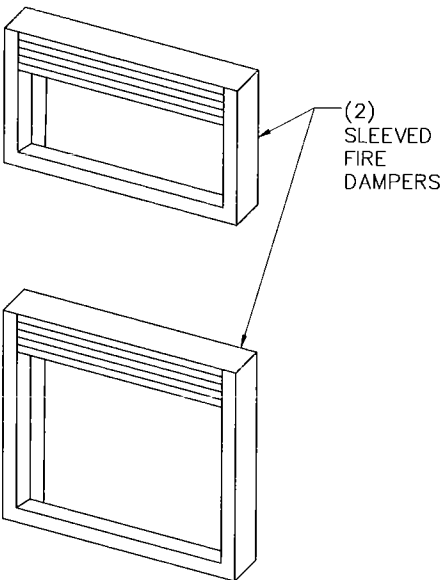
- NOTES:**
1. FRAME OUT HVAC OPENING PER DWG # **WOK-HVAC**
 2. ASSEMBLE BOTH PLENUM ASSEMBLIES PER DETAIL "**CROSS SECTION THRU PLENUM**".
 3. ATTACH THE OUTER RETAINING ANGLES TO ALL 4 SIDES OF SLEEVED/DAMPER WITH $\frac{1}{4}$ " TRUSS HEAD MACHINE BOLTS WITHIN 2" OF CORNERS AND 6" MAXIMUM SPACING. FIELD DRILL.
 4. TOP RETAINING ANGLE OF DAMPER/SLEEVE MAY BE FASTENED TO THE PANEL CONNECTOR WITH ONE # 12 S.D. FASTENER TO ASSIST IN GYPSUM INSTALLATION. AND THE BOTTOM DAMPER/SLEEVE MAY BE FASTENED TO THE REVERSE SEAL WITH ONE # 12 S.D. FASTENER TO ASSIST IN GYPSUM INSTALLATION.
 5. INSTALL FIRE WALL PER STANDARD FIREWALL DRAWINGS. BE SURE TO MAINTAIN $\frac{1}{4}$ " GAP ALL AROUND SLEEVE. - OMIT METAL LINER
 6. USE INNER RETAINING ANGLES TO SANDWICH THE WALL TO ALLOW FOR DAMPER/SLEEVE EXPANSION DURING PERIODS OF INTENSE HEAT AND ATTACH TO SLEEVE USING THE SAME METHOD DISCUSSED IN STEP 3.
 7. BUILD AND INSTALL PLENUMS PER DETAILS TO RIGHT
 8. INSTALL METAL LINER.



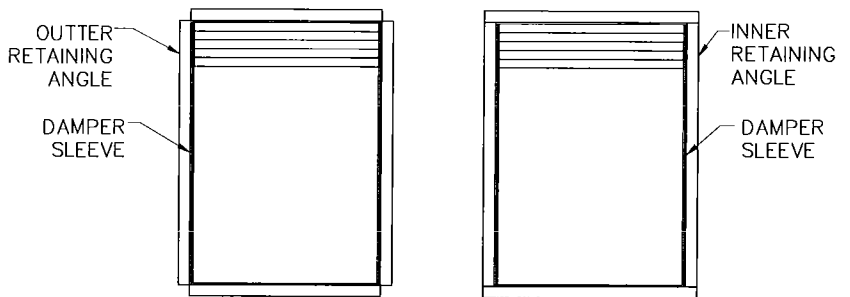
VERTICAL SECTION THRU HVAC UNIT



COSS SECTION THRU PLENUM



DETAIL 'A'-A'
TOP & BOTTOM PLENUM



COMPLETED DAMPER/SLEEVE ASSEMBLY

NOTE:
TOP OF PLENUM WALL HAS LONGER LEG THAN OTHER 3 SIDES

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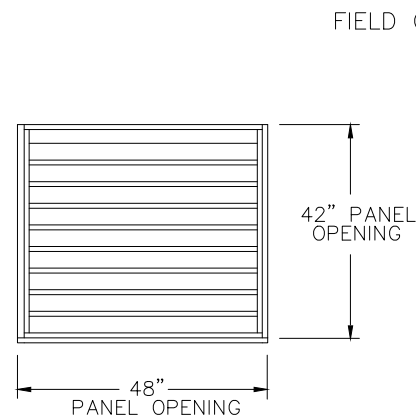


**WALL MOUNTED HVAC
UNIT WALL OPENING
INSTALLATION**

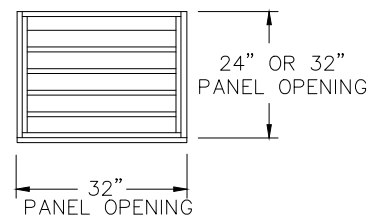
SECTIONS AND DETAILS

DATE	10-11-16
DRAWN BY	DJP
SCALE	NTS
ORDER NO.	
REVISION	0

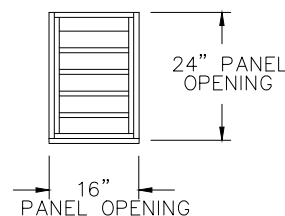
HM-HVAC-2



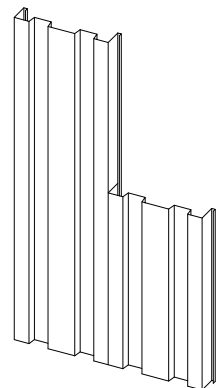
KLA4842



KLA3224 & KLA3232-1

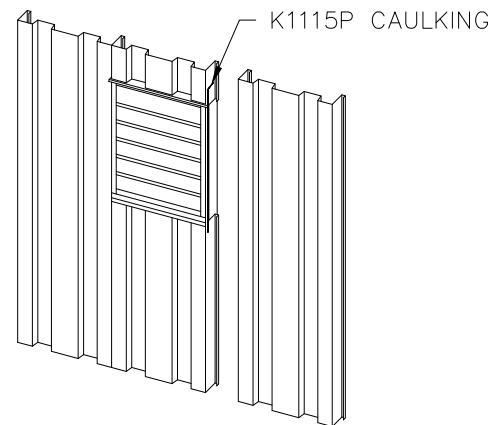


KLA1624



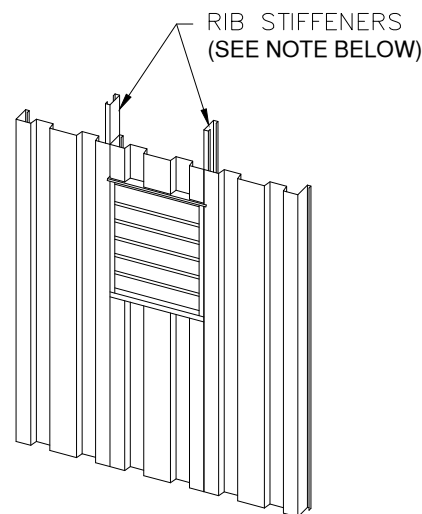
STEP # 1

WITH LEFT WALL PANEL IN PLACE, INSTALL SILL PANELS. (FIELD CUT HEAD AND SILL PANELS UNLESS OTHERWISE NOTED ON ERECTION DRAWINGS). INSTALL SILL CAP ON SILL PANELS. FIELD CUT LEFT WALL PANEL RIB AT LOUVER OPENING AS REQUIRED.



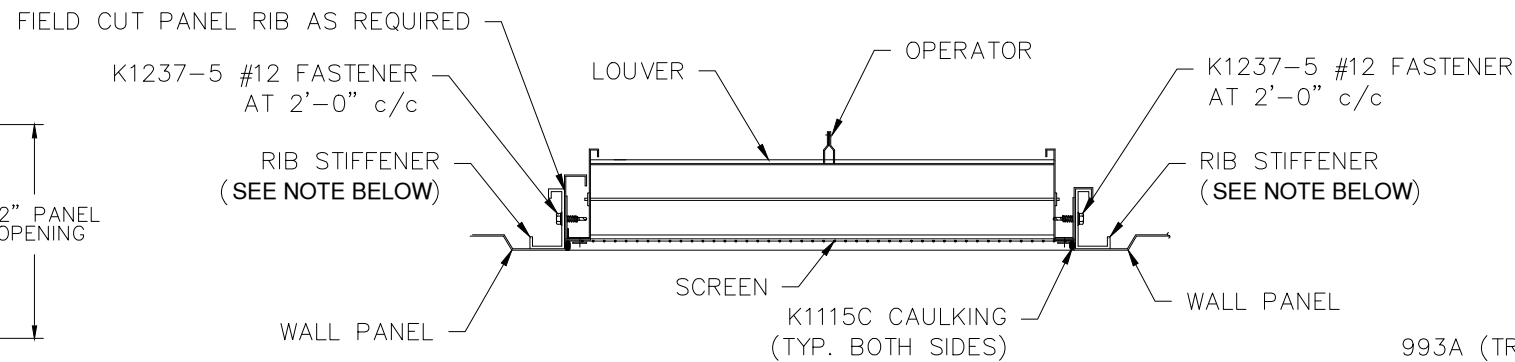
STEP # 2

CAULK SILL, JAMB AND TOP OF LOUVER. PLACE LOUVER IN WALL. POSITION PANEL CONNECTOR AND THEN INSTALL HEAD PANELS. SWEEP CAULK EACH HEAD PANEL AS SHOWN. CAULK PANEL RIB AS SHOWN ABOVE AND INSTALL NEXT WALL PANEL. FASTEN PANEL CONNECTOR TO HEAD PANEL RIBS W/ K1237-5 #12 FASTENER AT 16" c/c.

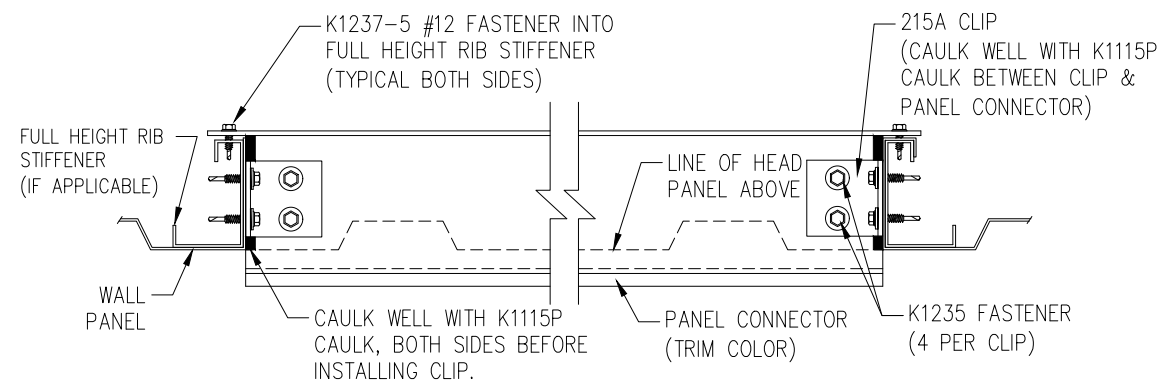


STEP # 3

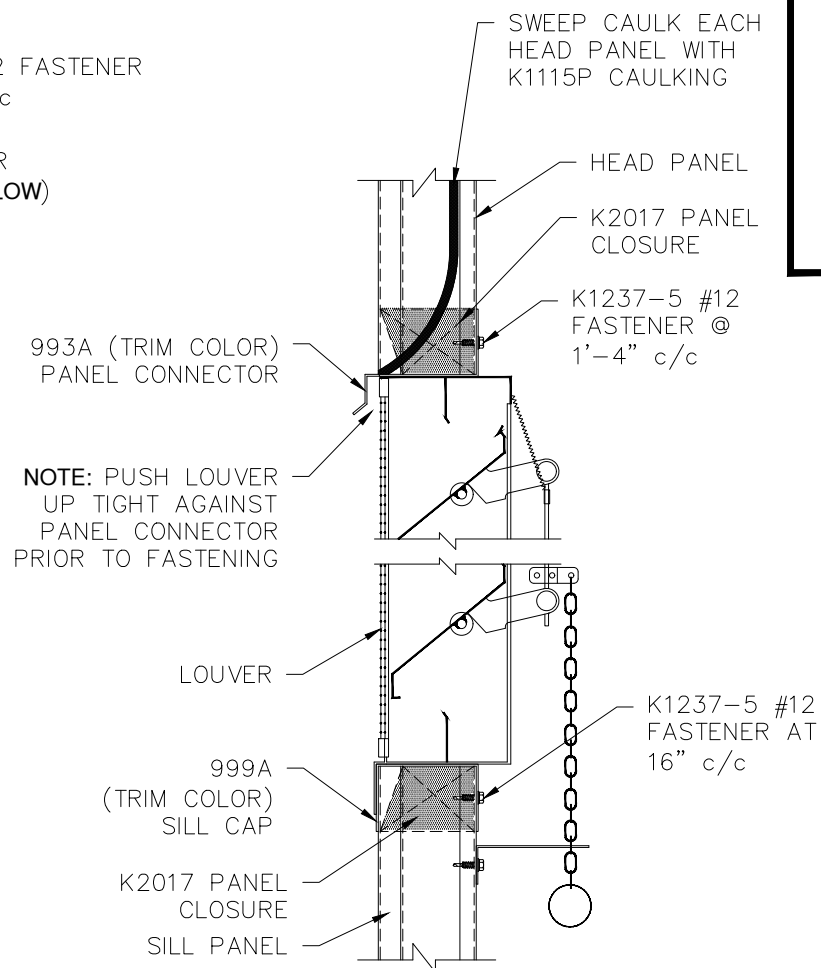
INSTALL RIB STIFFENER (SEE NOTE TO RIGHT) ON BOTH SIDES OF LOUVER. FASTEN LOUVER THROUGH STIFFENER W/ K1237-5 #12 FASTENERS @ 2'-0" c/c. (PUSH LOUVER UP TIGHT AGAINST PANEL CONNECTOR PRIOR TO FASTENING) BE SURE TO "DAM" CAULK EACH END OF PANEL CONNECTOR AT LEFT AND RIGHT WALL PANEL RIBS. FINISH CAULK BOTH SIDES OF LOUVER TO WALL PANELS.



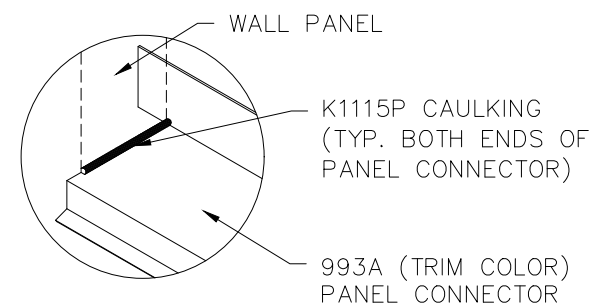
HORIZONTAL SECTION THROUGH LOUVER



TYPICAL SECTION @ PANEL CONNECTOR



VERTICAL SECTION THROUGH LOUVER



CAULKING DETAIL

NOTE:
RIB STIFFENERS ARE NOT REQUIRED ON KLA1624 LOUVERS IN 8'-0" HIGH BUILDINGS.

REVISIONS	BY
02-28-97	KAG
08-25-99	DLR
02-14-03	DLR
08-06-10	RAP
02-16-11	RAP
02-25-11	RAP
03-04-11	TLC
02-24-12	TLC
08-30-16	JMC

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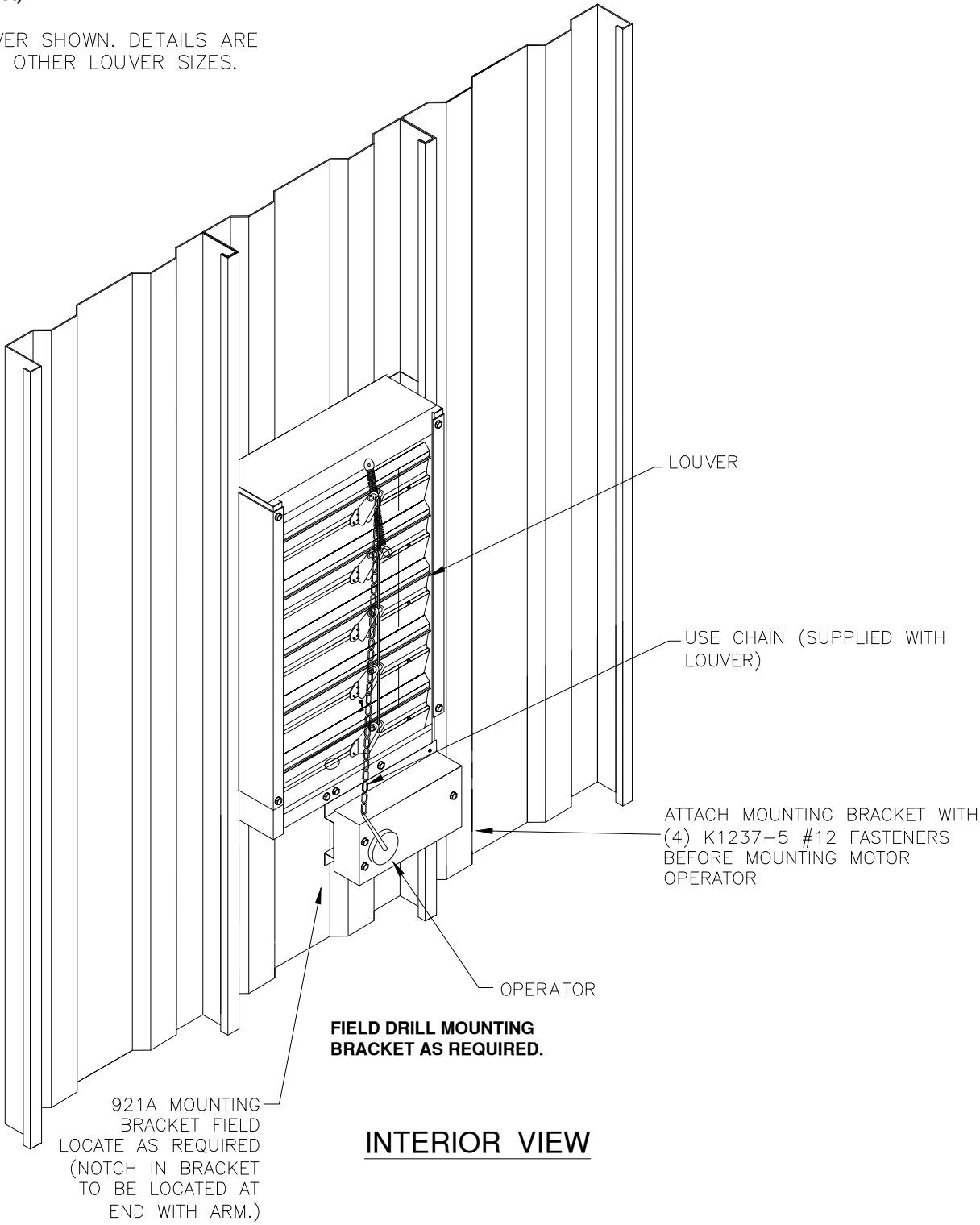
INSTALLATION OF
ADJUSTABLE WALL
LOUVER

DETAILS

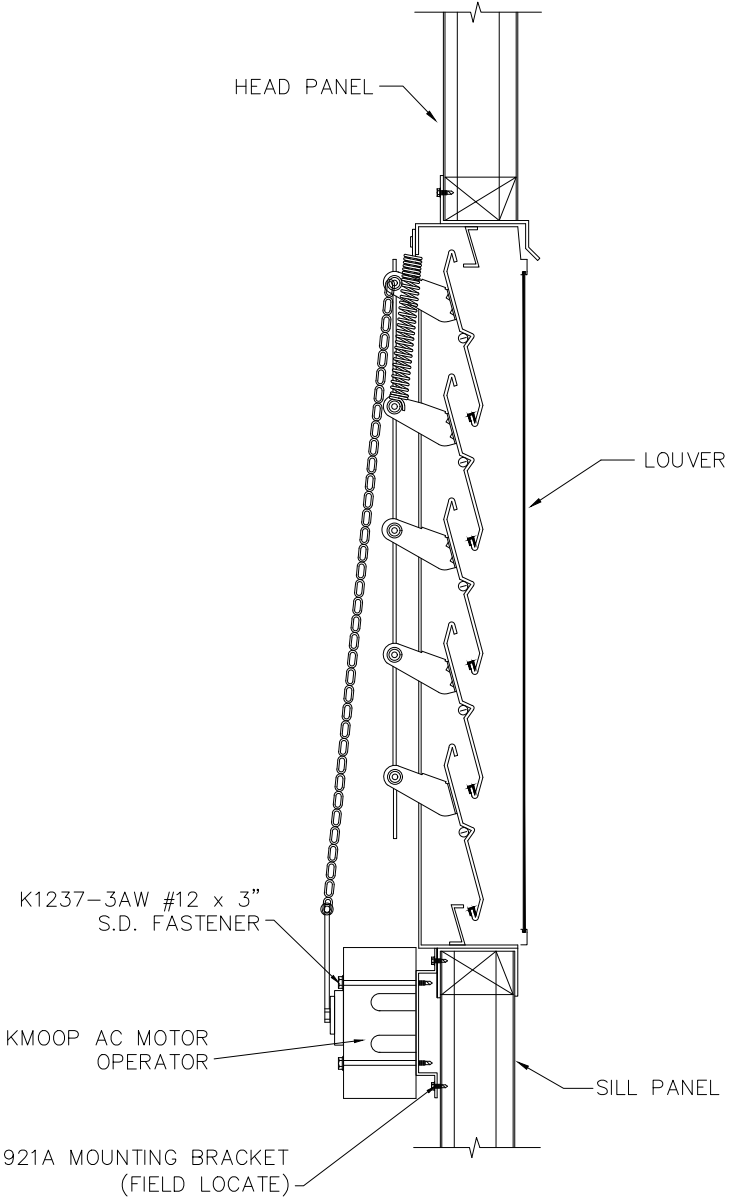
DATE	08-22-92
DRAWN BY	TLC
SCALE	NTS
ORDER NO.	
REVISION	9

LVR-A

- NOTES:** 1.) INSTALL LOUVER IN WALL PER STANDARD INSTALLATION DETAILS (SEE DWG. #LVR-A)
- 2.) 16"x 24" LOUVER SHOWN. DETAILS ARE THE SAME FOR OTHER LOUVER SIZES.



INTERIOR VIEW



FIELD DRILL MOUNTING BRACKET AS REQUIRED

VERTICAL SECTION THROUGH LOUVER

REVISIONS	BY
11-5-08	BAS
08-30-16	JMC

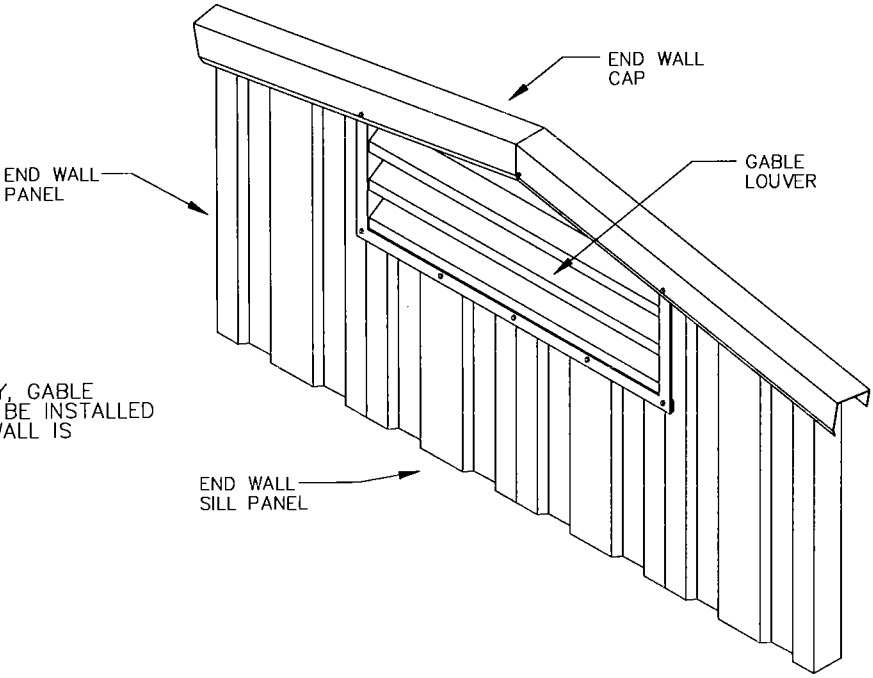


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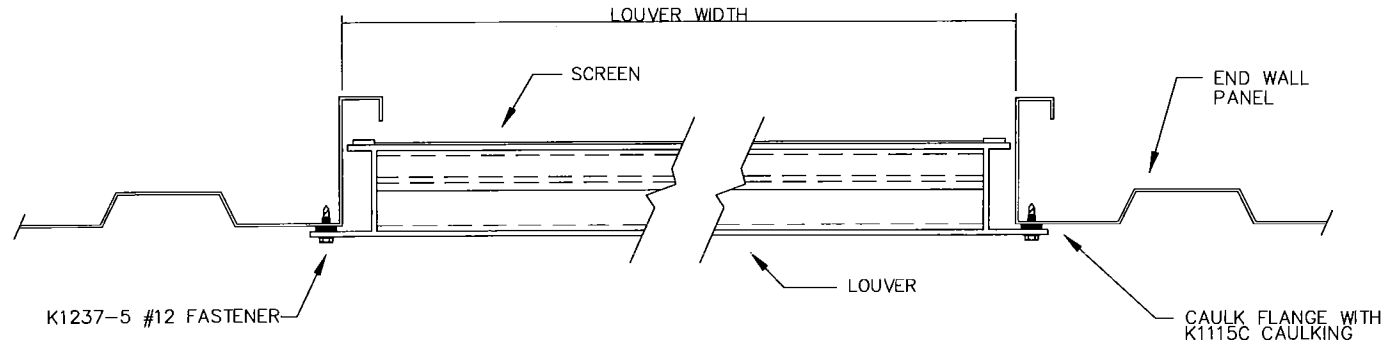
JOB DESCRIPTION	SHEET TITLE
ADJUSTABLE WALL LOUVER WITH AC POWERED MOTOR OPERATOR	INSTALLATION DETAILS

DATE	11-28-06
DRAWN BY	BHKJ
SCALE	N.T.S
ORDER NO.	
REVISION	2
DWG. NO.	LVR-AC-MO

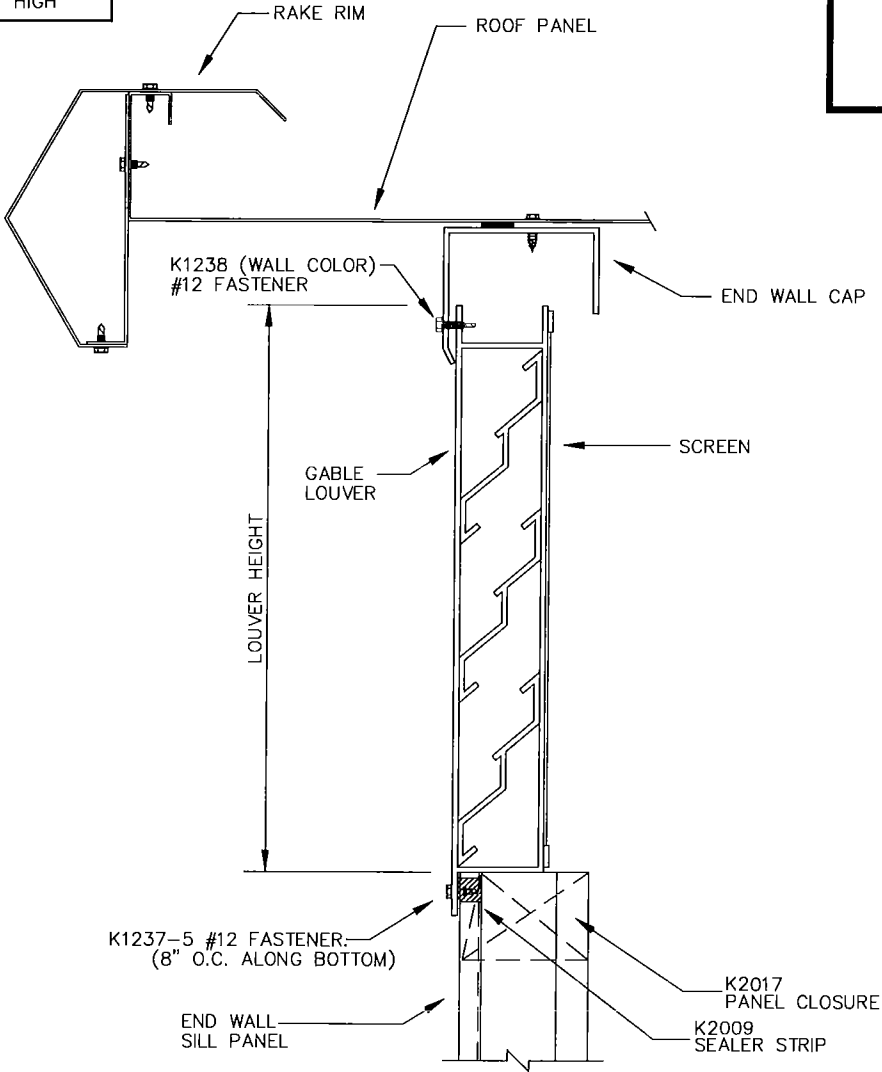
BUILDING WIDTH	PART #	LOUVER SIZE
12' & 20'	KL63206	32" WIDE x 6" HIGH
16' & 24'	KL61610	16" WIDE x 10" HIGH
28'	KL63212	32" WIDE x 12" HIGH
32'	KL64812	48" WIDE x 12" HIGH



NOTE:
IF NECESSARY, GABLE LOUVER MAY BE INSTALLED AFTER END WALL IS COMPLETED.



HORIZONTAL SECTION THRU GABLE LOUVER



VERTICAL SECTION THRU GABLE LOUVER

INSTALLATION PROCEDURE

STEP 1. REFER TO THE PANEL LOCATION DRAWING FOR SILL PANEL LENGTHS. LOUVER IS TO BE PLACED AT CENTER LINE OF BUILDING.

STEP 2. APPLY CAULKING ALONG FLANGES OF LOUVER 1/4" FROM EDGE.

STEP 3. SET LOUVER IN PLACE AND FASTEN THROUGH FLANGE INTO FACE OF PANELS WITH #12 FASTENER. (INSTALL K2009 SEALER STRIP AT TOP OF SILL PANEL BEFORE INSTALLING FASTENERS)

STEP 4. ATTACH END WALL CAP TO CENTER LINE OF LOUVER WITH K1238 #12 FASTENERS.

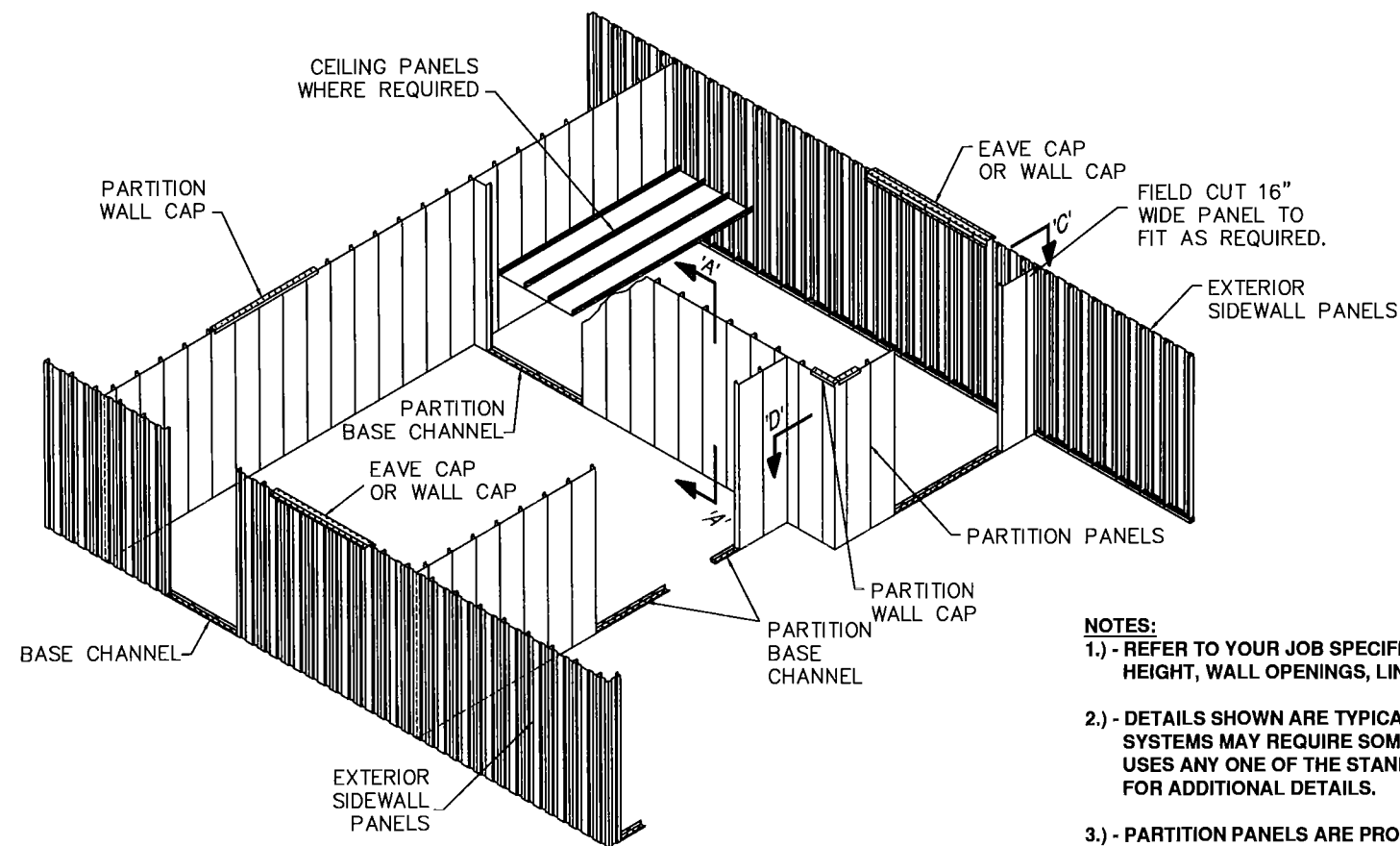
REVISIONS	BY
01-11-05	WBD
11-02-06	BHKJ
09-29-11	TLC

PARKLINE, INC.
P. O. Box 65 Winfield, WV 25213
phone: (304) 586-2113

GABLE LOUVER INSTALLATION
FOR TYPE 'AL' BUILDINGS

DETAIL

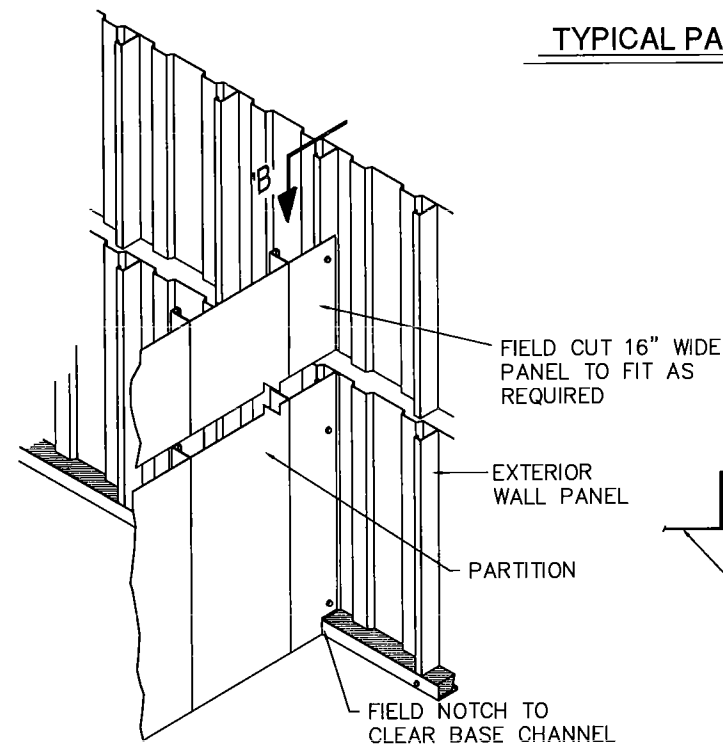
DATE	12-21-94
DRAWN BY	JEH
SCALE	NTS
ORDER NO.	
REVISION	3
DWG. NO.	LVR-G



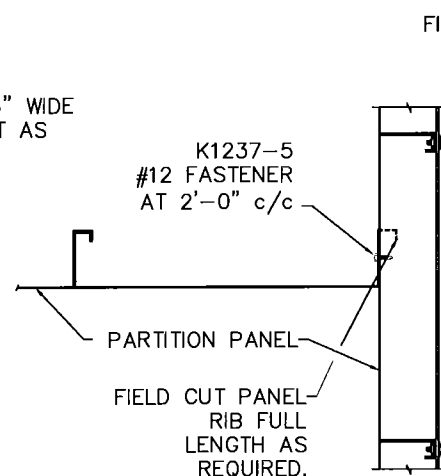
TYPICAL PARTITION LAYOUT

NOTES:

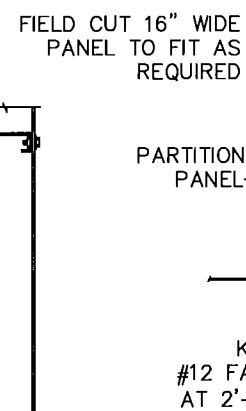
- 1.) - REFER TO YOUR JOB SPECIFIC DRAWINGS FOR ACTUAL PARTITION LAYOUT, HEIGHT, WALL OPENINGS, LINER SYSTEMS, ETC. BEFORE BEGINNING.
- 2.) - DETAILS SHOWN ARE TYPICAL FOR ALL STANDARD PARTITIONS. WALL LINER SYSTEMS MAY REQUIRE SOME DEVIATIONS OF THESE DETAILS. IF YOUR BUILDING USES ANY ONE OF THE STANDARD LINER SYSTEMS, REFER TO THOSE DRAWINGS FOR ADDITIONAL DETAILS.
- 3.) - PARTITION PANELS ARE PROVIDED IN FULL 16" WIDTH, (EXCEPT FOR CORNERS AND 8" WIDE IF REQUIRED) AND MUST BE FIELD CUT TO REQUIRED WIDTH.
- 4.) - MOST BUILDINGS WITH PARTITION SYSTEMS ALSO USE THE METAL CEILING SYSTEM. PARTITION PANELS WOULD STOP BELOW CEILING AS SHOWN IN SECTION 'A'-A' ABOVE. PARTITIONS WOULD BE ATTACHED TO CEILING AS SHOWN.
- 5.) - IF YOUR SPECIFIC BUILDING DOES NOT USE THE METAL CEILING SYSTEM, THEN REFER BACK TO YOUR JOB SPECIFIC DRAWING FOR ADDITIONAL DETAILS AND INFORMATION.



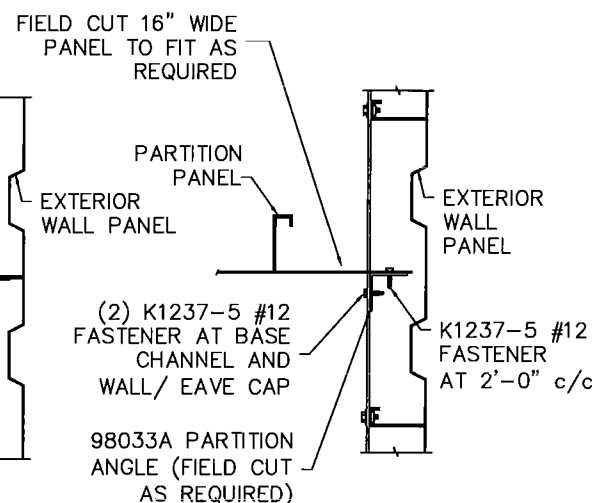
**PARTITION CONNECTION
AT PANEL RIBS**



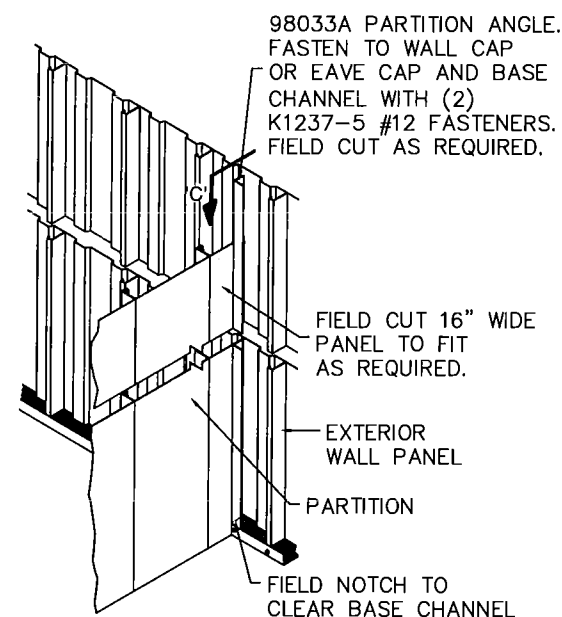
VIEW 'D'
PARTITION TO PARTITION CONNECTION



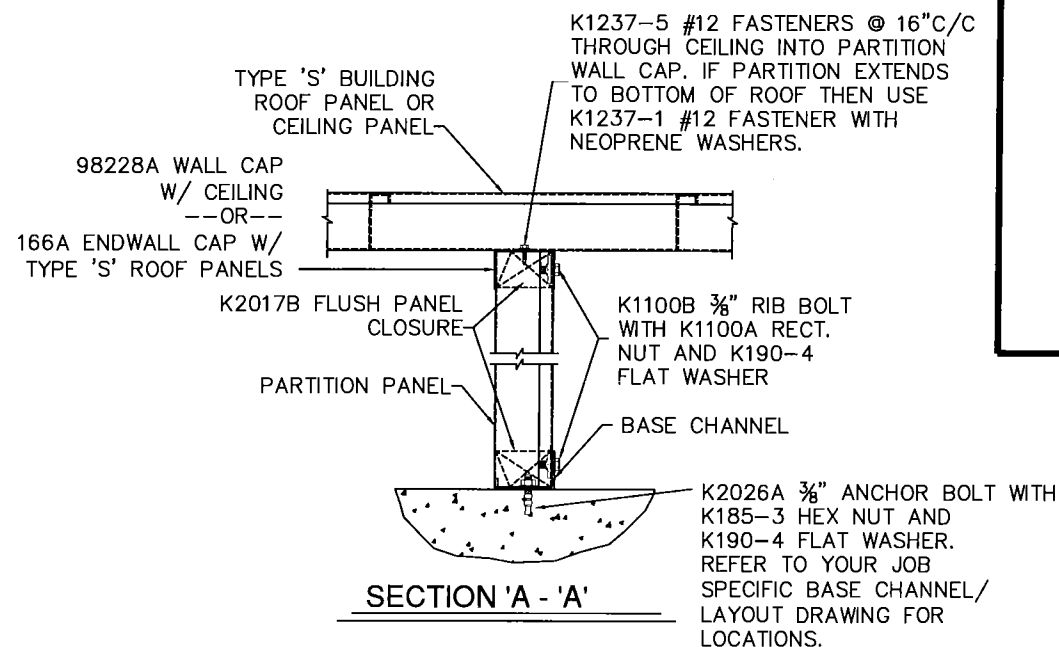
VIEW 'B'
PARTITION TO WALL PANEL RIB



VIEW 'C'
PARTITION TO WALL BETWEEN RIBS



**PARTITION CONNECTION
BETWEEN PANEL RIBS**



REVISIONS	BY
01-11-05	WBD
02-28-05	RAP
1-10-08	BAS
05-13-09	CS
08-15-16	JMC

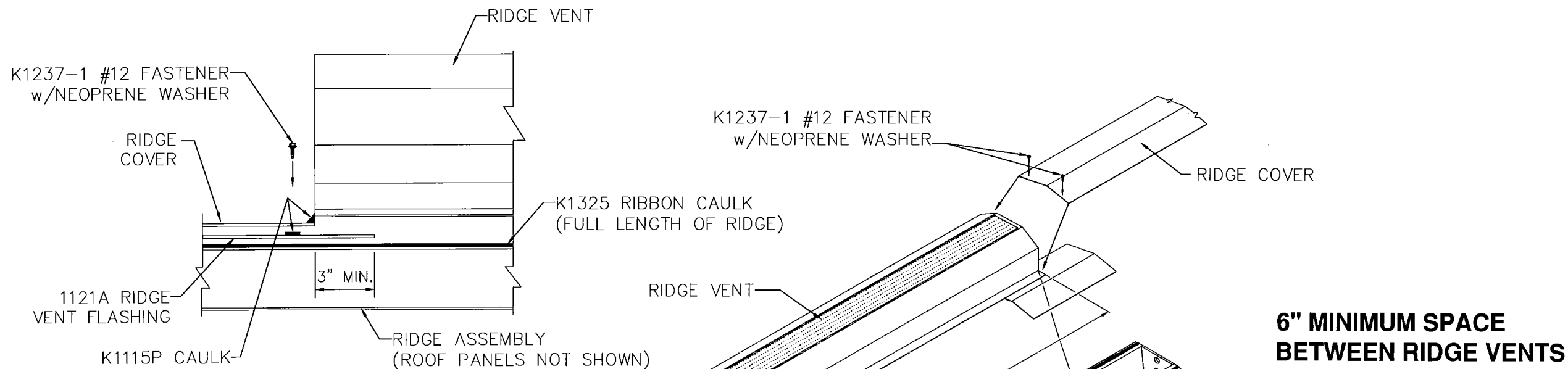
PARKLINE, INC.
328 INDUSTRIAL PARK DRIVE
ELEANOR, WV 26070
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PHONE: 800-786-4855
FAX: 304-566-3842



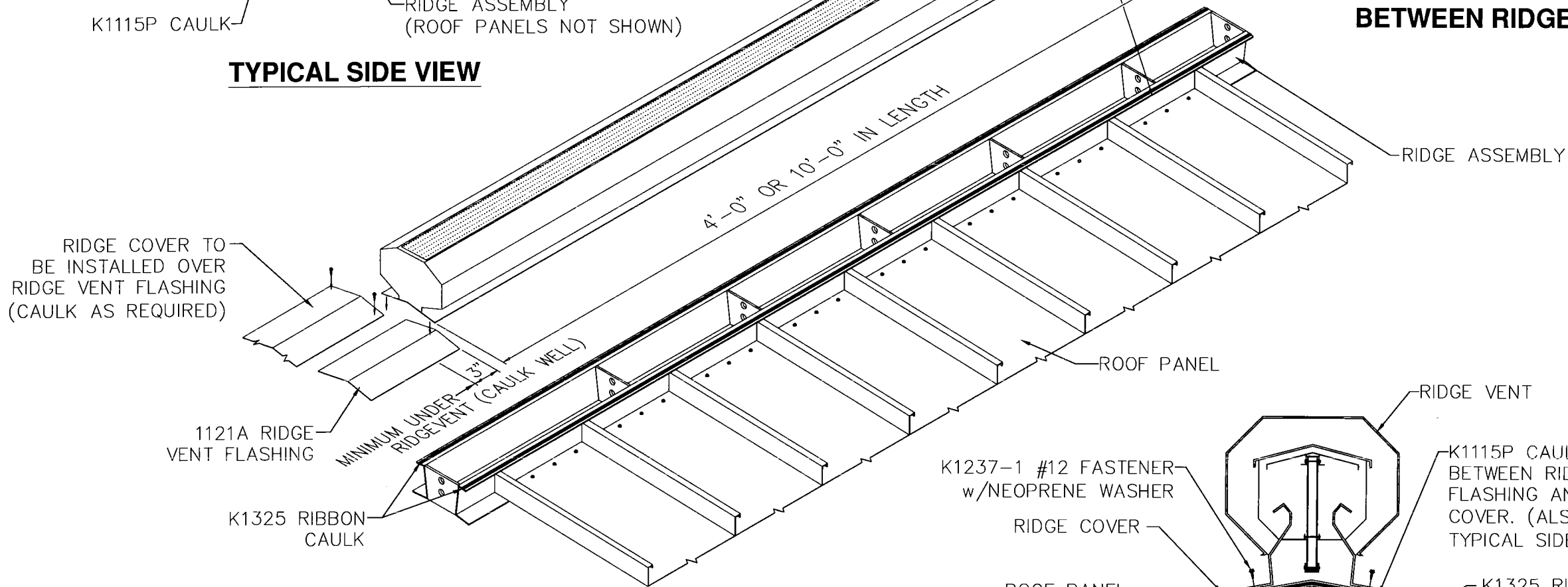
**METAL PARTITION SYSTEM
FOR ALL PARKLINE BUILDINGS**

INSTALLATION DETAILS

DATE 10-16-03
DRAWN BY RAP
SCALE N.T.S.
ORDER NO.
REVISION 5
DWG. NO. PARTITION-1



TYPICAL SIDE VIEW

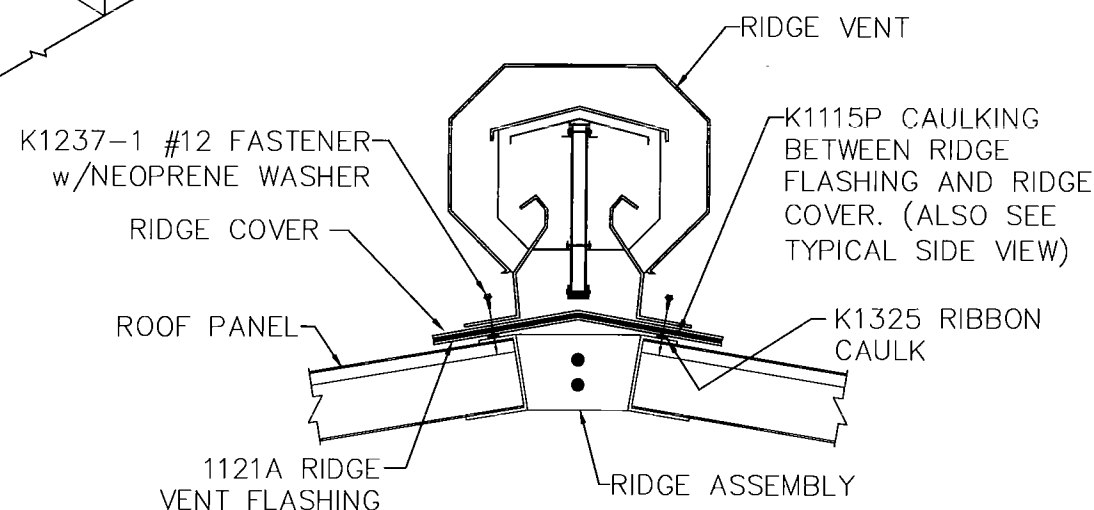


**6" MINIMUM SPACE
BETWEEN RIDGE VENTS**

ERECTOR NOTE:
DISREGARD MANUFACTURER
SUPPLIED INSTRUCTION PROVIDED
WITH RIDGE VENT. INSTALL
ACCORDING TO PARKLINE ERECTION
DRAWING AND SPECIFICATIONS.

RIDGE VENTILATOR INSTALLATION

ALSO REFER TO STANDARD ROOF AND
RIDGE COVER DETAILS SHOWN ON DRAWING
#AL-ROOF OR #ROOF-6AL



TYPICAL CROSS SECTION

REVISIONS	BY
01-13-05	WBD
09-10-07	CEM
11-29-11	KRK
05-15-2012	KRK
02-04-16	JMC

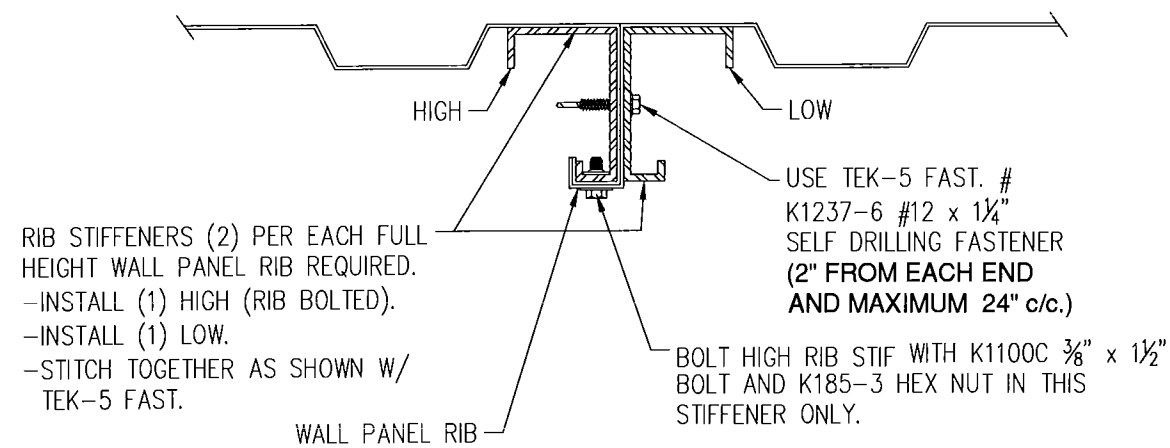
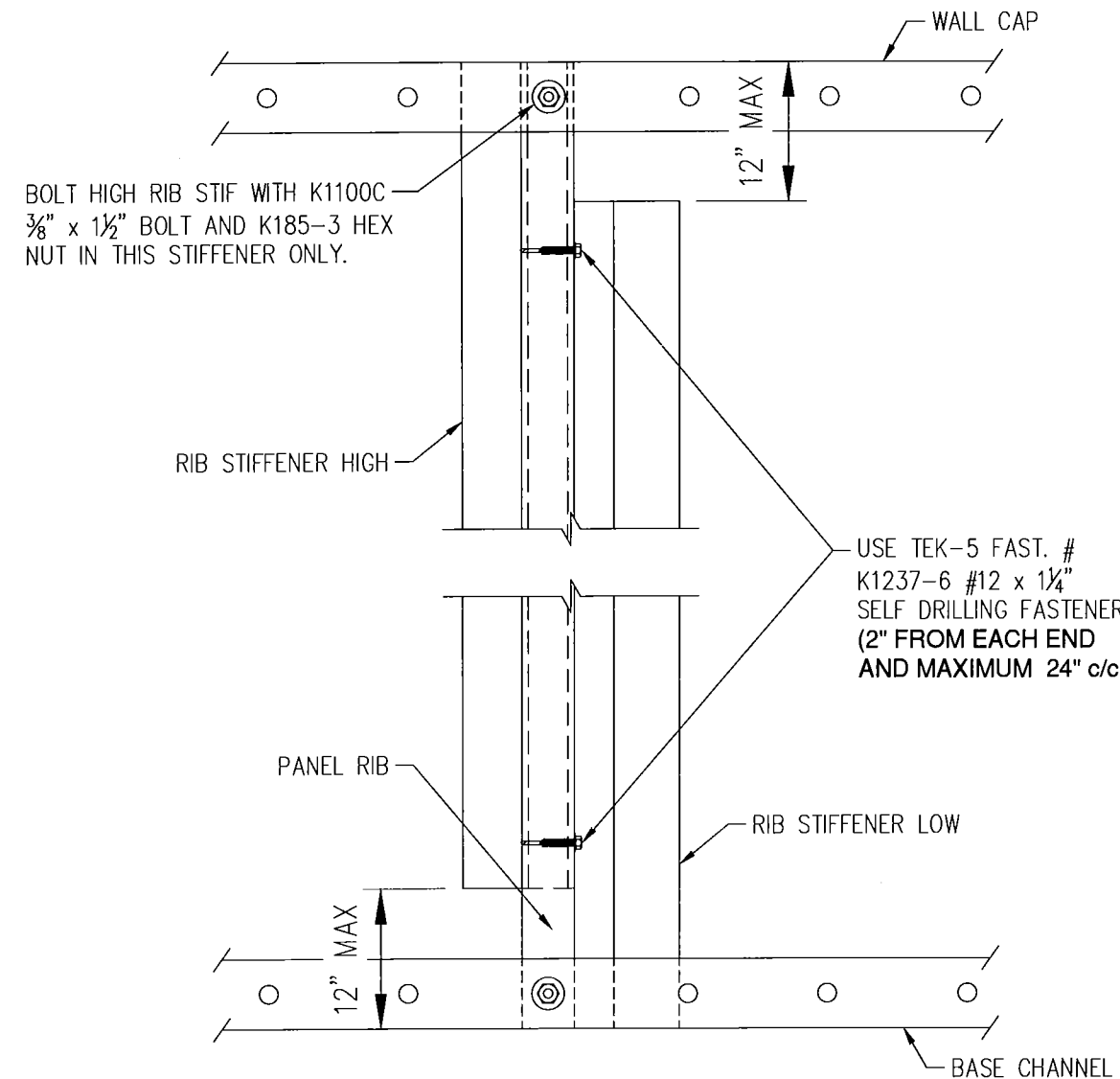
PARKLINE, INC.
RT. 62, ELEANOR INDUSTRIAL PARK
ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855
FAX: 304-586-3842
ENGINEER: TOM HARDING
THARDING@PARKLINE.COM



JOB DESCRIPTION	RIDGE VENT INSTALLATION FOR TYP 'AL' BUILDINGS
	SHEET TITLE
INSTALLATION DETAILS	

DATE	10-17-03
DRAWN BY	RAP
SCALE	NTS
ORDER NO.	
REVISION	5

RIDGEVENT-AL



DOUBLE RIB STIFFENER HIGH/ LOW

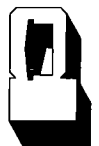
NOTES:

- THIS BUILDING REQUIRES THE INSTALLATION OF ADDITIONAL RIB STIFFENERS TO MEET EITHER OF THE FOLLOWING SITUATIONS:
 - DUE TO THE COMBINATION OF SIZE AND DESIGN LOAD REQUIREMENTS, ALL FULL HEIGHT WALL PANEL RIBS MUST BE REINFORCED.
 - OR
 - EQUIPMENT LOADS BEING APPLIED TO THE WALL PANELS REQUIRE THAT SOME FULL HEIGHT WALL PANEL RIBS BE REINFORCED.

IN EITHER CASE REFER TO THE BUILDING ELEVATION DRAWING FOR REQUIRED RIB STIFFENER LOCATIONS AND USAGE OF SINGLE OR DOUBLE STIFFENERS.
- K1235 STITCH SCREWS ARE NOT REQUIRED AT STIFFENER LOCATION.
- IN ANY LOCATION WHERE ONLY ONE RIB STIFFENER CAN BE INSTALLED, IT MUST BE THE FULL HEIGHT OF THE WALL PANEL INTO WHICH IT IS BEING INSTALLED.

REVISIONS BY

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328 INDUSTRIAL PARK DRIVE
ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855
FAX: 304-586-3842



JOB DESCRIPTION
**HIGH / LOW RIB STIFFENER
INSTALLATION**

SHEET TITLE
DETAIL

DATE 07-13-17

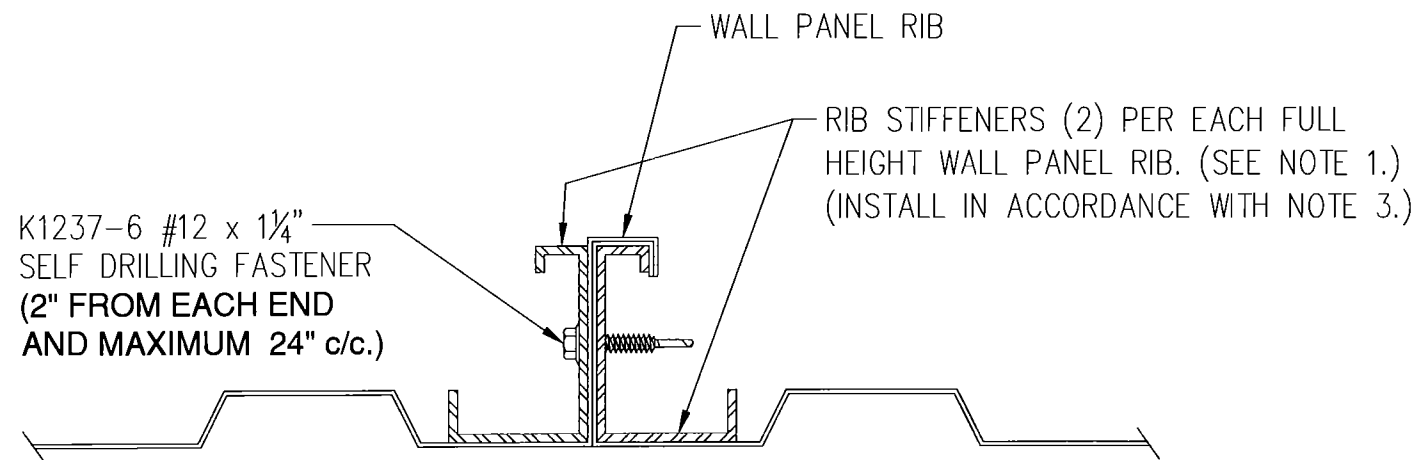
DRAWN BY MRW

SCALE NTS

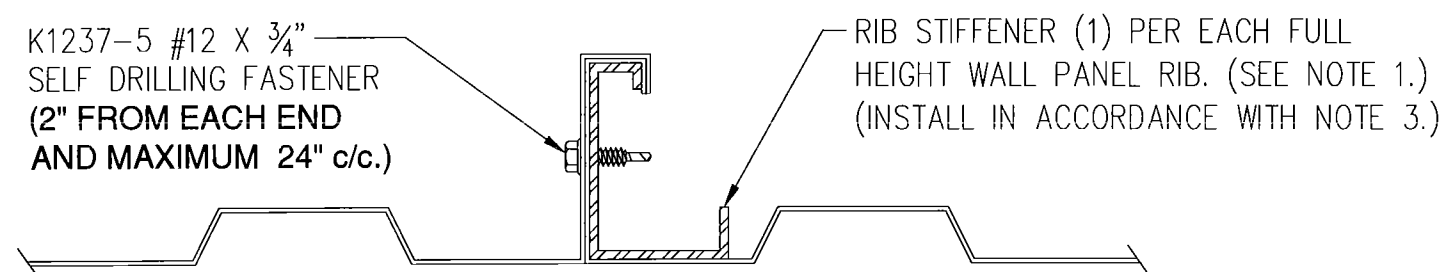
ORDER NO.

REVISION

STIFF-HL



DOUBLE RIB STIFFENER



SINGLE RIB STIFFENER

NOTES:

1. THIS BUILDING REQUIRES THE INSTALLATION OF ADDITIONAL RIB STIFFENERS TO MEET EITHER OF THE FOLLOWING SITUATIONS:

A. -DUE TO THE COMBINATION OF SIZE AND DESIGN LOAD REQUIREMENTS, ALL FULL HEIGHT WALL PANEL RIBS MUST BE REINFORCED.

OR

B. -EQUIPMENT LOADS BEING APPLIED TO THE WALL PANELS REQUIRE THAT SOME FULL HEIGHT WALL PANEL RIBS BE REINFORCED.

IN EITHER CASE REFER TO THE BUILDING ELEVATION DRAWING FOR REQUIRED RIB STIFFENER LOCATIONS AND USAGE OF SINGLE OR DOUBLE STIFFENERS.

2. K1235 STITCH SCREWS ARE NOT REQUIRED AT STIFFENER LOCATION.

3. STANDARD LENGTH RIB STIFFENERS ARE PROVIDED. RIB STIFFENER TO BE INSTALLED CENTERED BETWEEN BASE CHANNEL AND WALL CAP OR GIRT OF EACH FULL HEIGHT RIB UNLESS OTHERWISE SPECIFIED. THE DISTANCE FROM THE BASE CHANNEL TO BOTTOM OF RIB STIFFENER AND THE DISTANCE BETWEEN THE TOP OF THE RIB STIFFENER AND THE WALL CAP OR GIRT TO BE EQUAL.

FULL HEIGHT RIB STIFFENER INSTALLATION:

SOME BUILDING DESIGNS REQUIRE THAT RIB STIFFENERS BE FULL EAVE HEIGHT WHICH MAY REQUIRE FIELD CUTTING AND DRILLING OF RIB STIFFENERS TOP AND BOTTOM FOR RIB BOLT CONNECTION. REPLACE STANDARD RIB BOLT AND RECTANGULAR NUT WITH K1100C $\frac{3}{8}$ " x $1\frac{1}{2}$ " BOLT AND K185-3 HEX NUT IN THIS SITUATION ONLY.

FULL HEIGHT DOUBLE RIB STIFFENER INSTALLATION:

SOME BUILDINGS MAY REQUIRE DOUBLE STIFFENERS WITH FULL HEIGHT STIFFENERS. IN THIS CASE, ONLY ONE OF THE STIFFENERS MUST BE FULL HEIGHT. THE SECOND STIFFENER WILL BE SHORTER AS IN NOTE 3 ABOVE. SINGLE STIFFENERS NEXT TO ACCESSORIES IN THIS SITUATION MUST BE FULL HEIGHT, AND RIB BOLTED IN PLACE.

REVISIONS	BY
01-25-05	DLR
01-14-15	JMC
02-17-15	JMC
05-18-16	MRW
02-03-17	JMC

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JOB DESCRIPTION
**SINGLE AND DOUBLE RIB
STIFFENER INSTALLATION**

SHEET TITLE
DETAIL

DATE 06-17-96

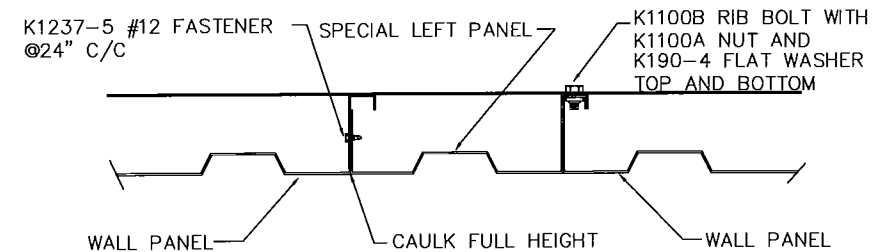
DRAWN BY KAG

SCALE NTS

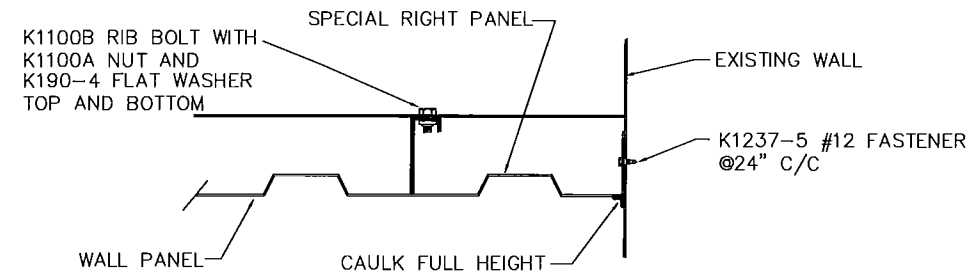
ORDER NO.

REVISION 5

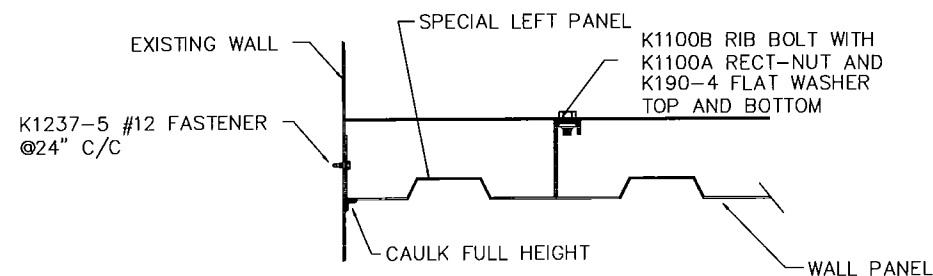
STIF-RIB



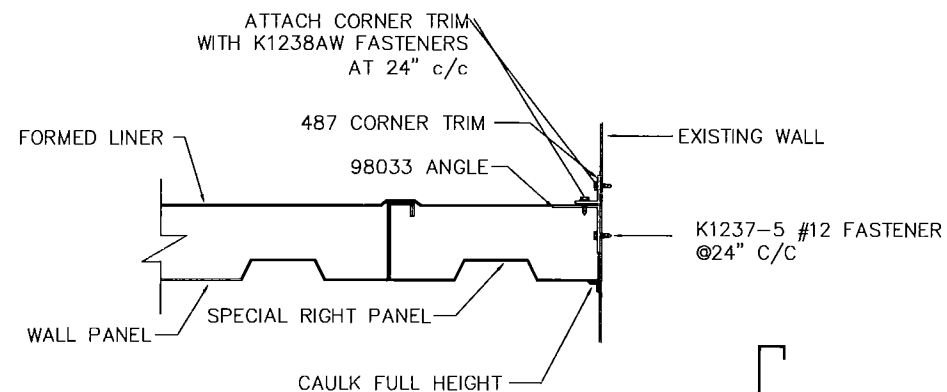
**TYPICAL DETAIL OF SPECIAL
WIDTH WALL PANEL BETWEEN TWO
STANDARD WALL PANELS.**



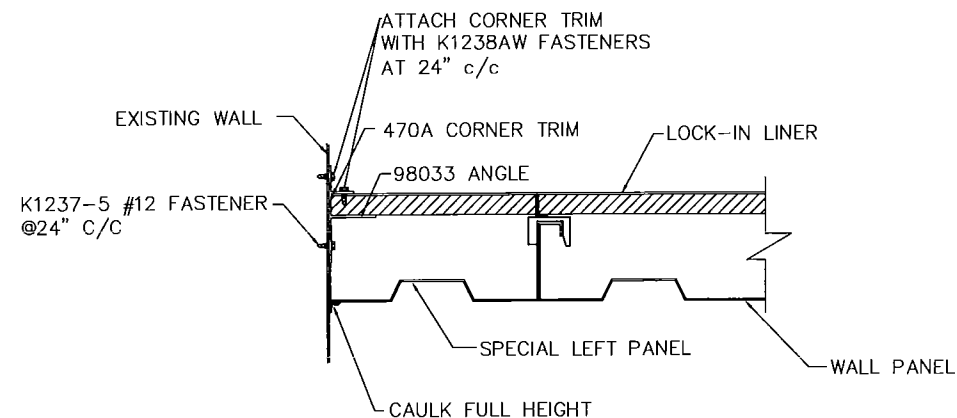
**TYPICAL DETAIL OF SPECIAL
WIDTH WALL PANEL ENDING
AT AN EXISTING WALL.**



**TYPICAL DETAIL OF SPECIAL
WIDTH WALL PANEL STARTING
AT AN EXISTING WALL.**



**TYPICAL DETAIL OF SPECIAL
WIDTH WALL PANEL WITH
FORMED WALL LINER ENDING
AT AN EXISTING WALL.**



**TYPICAL DETAIL OF SPECIAL WIDTH WALL PANEL WITH
LOCK-IN LINER STARTING AT AN EXISTING WALL (NOTE
LOCK-IN PLUS LINER DETAIL WOULD BE THE SAME)**

NOTES:

- 1). THE MOST COMMON SPECIAL WIDTH WALL PANELS ARE 8" WIDE. THESE ARE USED TO ALLOW ADDITIONAL FLEXIBILITY IN LOCATING WALL OPENINGS. 8" PANELS ARE PROVIDED IN LEFT OR RIGHT AS SHOWN ABOVE. THE PARTIAL LEG IS ALWAYS TO BE CAULKED AND STITCHED AS SHOWN IN DETAILS.
- 2). ADDITIONAL SPECIAL WIDTH WALL PANELS ARE AVAILABLE WHEN REQUIRED. PLEASE NOTE THAT NOT ALL SPECIAL WIDTH PANELS CAN BE MADE AS A FLUTED PANEL. SOME MUST BE MADE FLAT. ALL SPECIAL WIDTH WALL PANELS WILL REQUIRE FIELD CUTTING AND DRILLING AS REQUIRED.
- 3). IF SPECIAL WIDTH PANEL IS CONNECTED TO A NON-METAL EXISTING STRUCTURE, CUSTOMER MUST SUPPLY REQUIRED FASTENERS.

REVISIONS	BY
05-20-05	WBD
10-26-05	CBP
11-02-06	BHKJ
05-18-16	MRW

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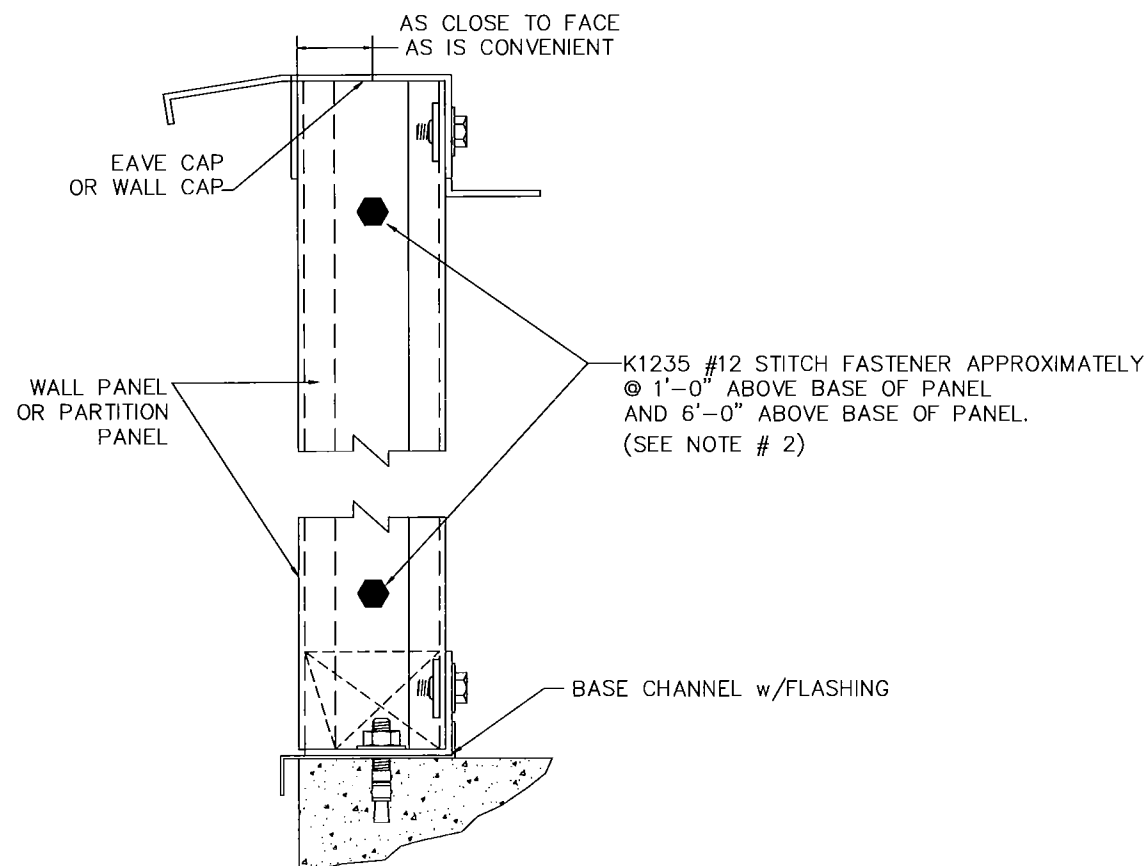


**INSTALLATION OF SPECIAL
WIDTH WALL PANEL**

DETAILS

DATE	12-16-04
DRAWN BY	WBD
SCALE	NTS
ORDER NO.	
REVISION	4
DWG. NO.	

SWP-1



NOTE #1:

K1235 STITCH FASTENERS
ARE INSTALLED IN ALL WALL
AND PARTITION PANELS.
DO NOT INSTALL UNTIL BUILDING
IS SQUARE AND PLUMB.

NOTE #2:

ON BUILDINGS WITH AN EAVE HEIGHT
OF MORE THAN 14'-0" IT IS NECESSARY
TO INSTALL (1) ADDITIONAL STITCH FASTENER
APPROXIMATELY AT, 12'-0" ABOVE BASE.

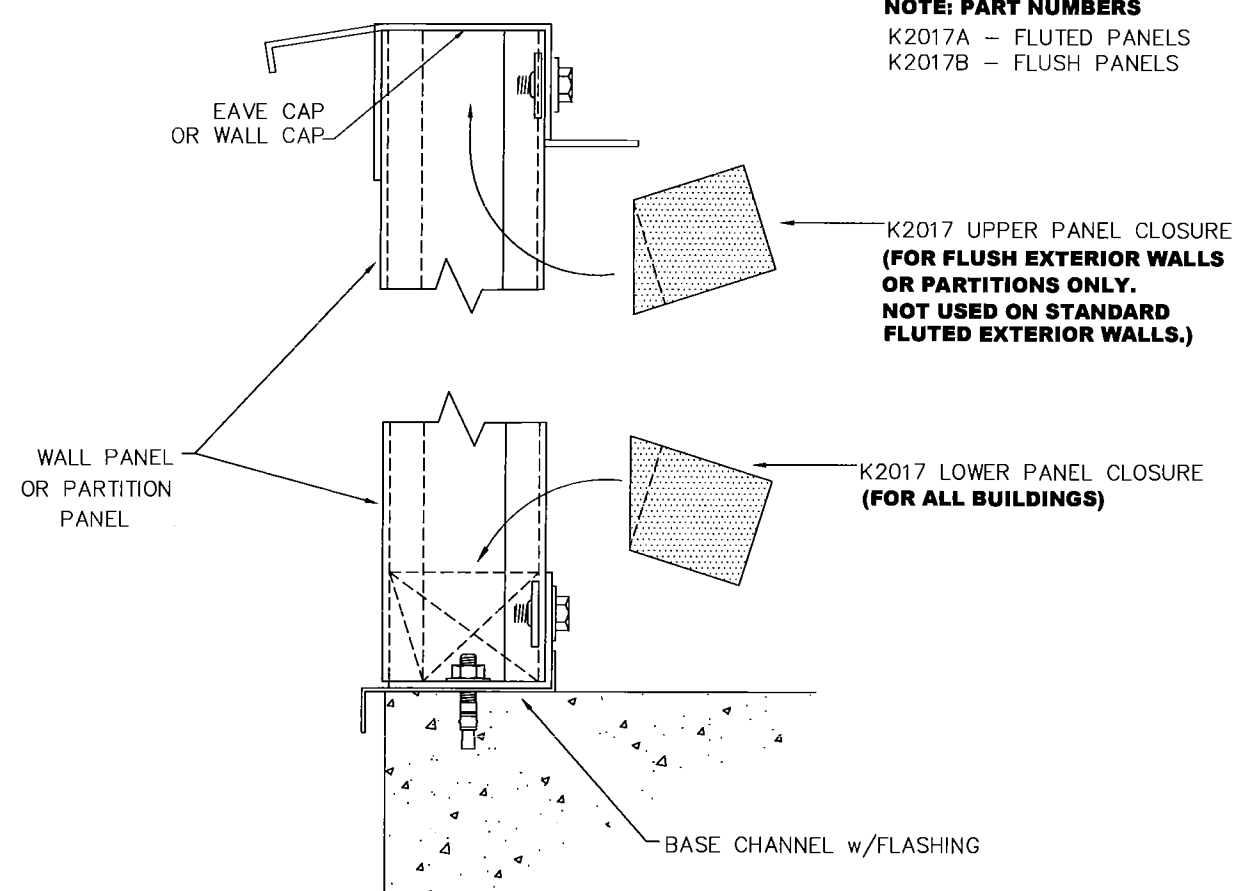
NOTE:

K2017 PANEL CLOSURES ARE
INSTALLED AT THE BOTTOM
OF ALL FLUTED EXTERIOR
WALL PANELS AND TOP AND
BOTTOM OF ALL FLUSH EXTERIOR
WALL PANELS AND FLUSH INTERIOR
PARTITION PANELS.
PANEL CLOSURES ARE TO BE
INSTALLED AFTER BUILDING HAS
BEEN SQUARED AND PLUMBED.
PANEL CLOSURES ARE ALSO
INSTALLED AT TOP AND BOTTOM
OF ALL WALL OPENINGS.

NOTE:

(PERTAINING TO MINI-WAREHOUSE BUILDINGS ONLY)

PANEL CLOSURES ARE USED ONLY ON
EXTERIOR FLUTED WALL PANELS.
PANEL CLOSURES ARE NOT INSTALLED
ON INTERIOR FLUSH PARTITION PANELS.



NOTE: PART NUMBERS

K2017A - FLUTED PANELS
K2017B - FLUSH PANELS

REVISIONS	BY
05-10-05	RAP
11-07-05	CBP
11-06-06	BHKJ
4-9-08	BAS
05-18-16	MRW

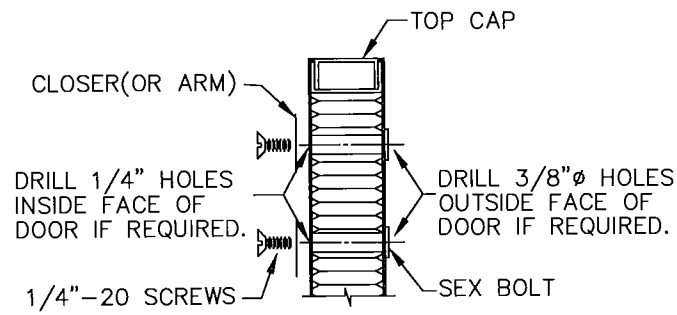
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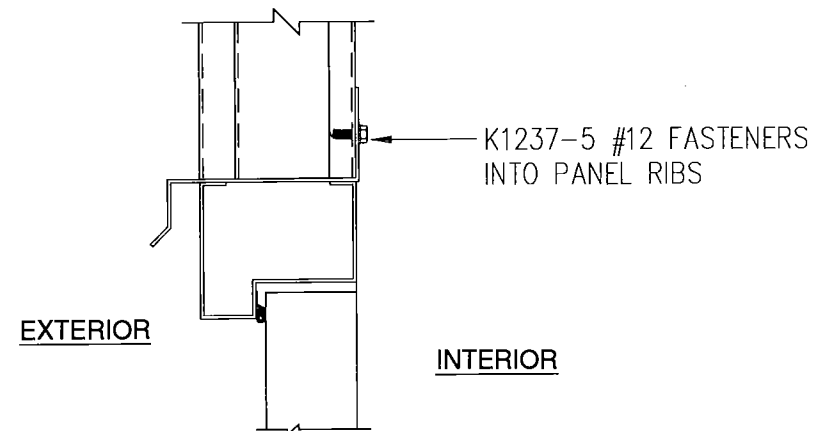
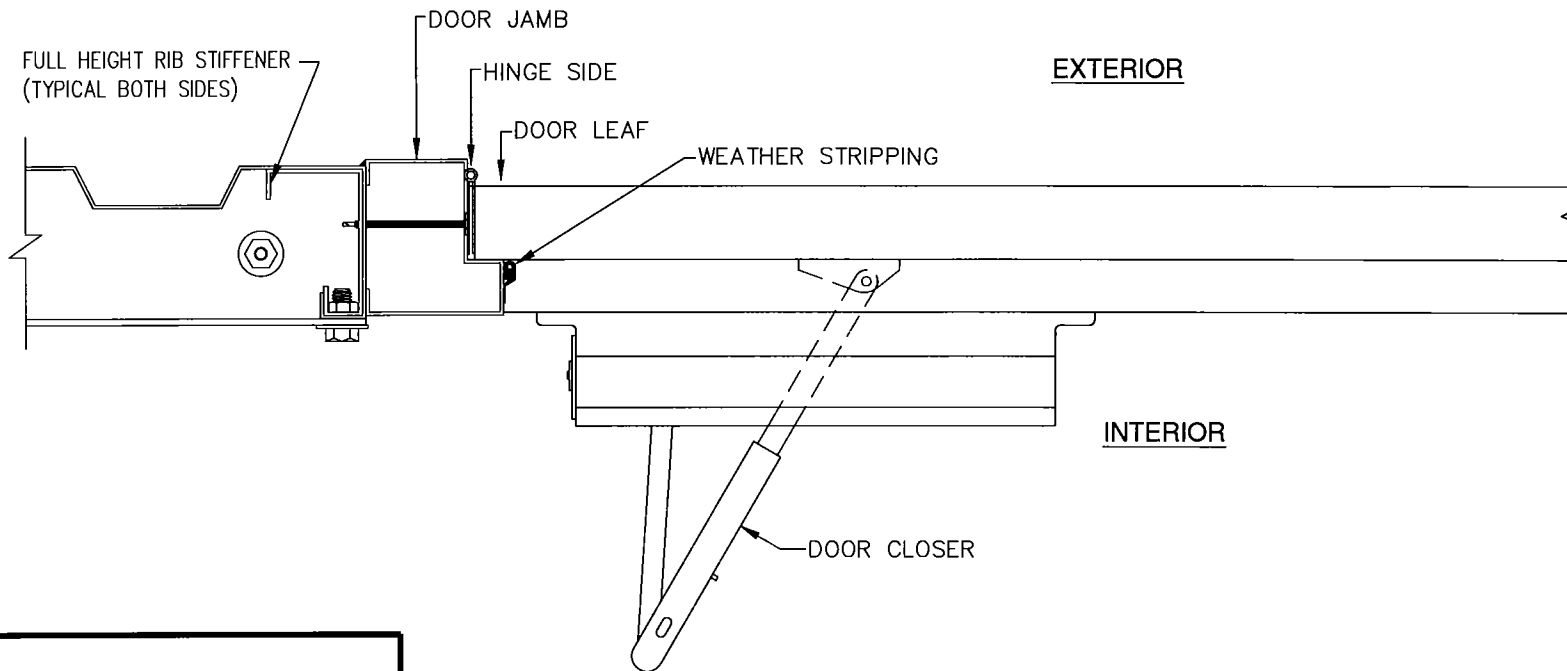
JOB DESCRIPTION	SHEET TITLE
STITCH FASTENER AND PANEL CLOSURE INSTALLATION FOR ALL BUILDINGS	DETAILS

DATE	03-07-05
DRAWN BY	RAP
SCALE	NTS
ORDER NO.	
REVISION	5
DWG. NO.	

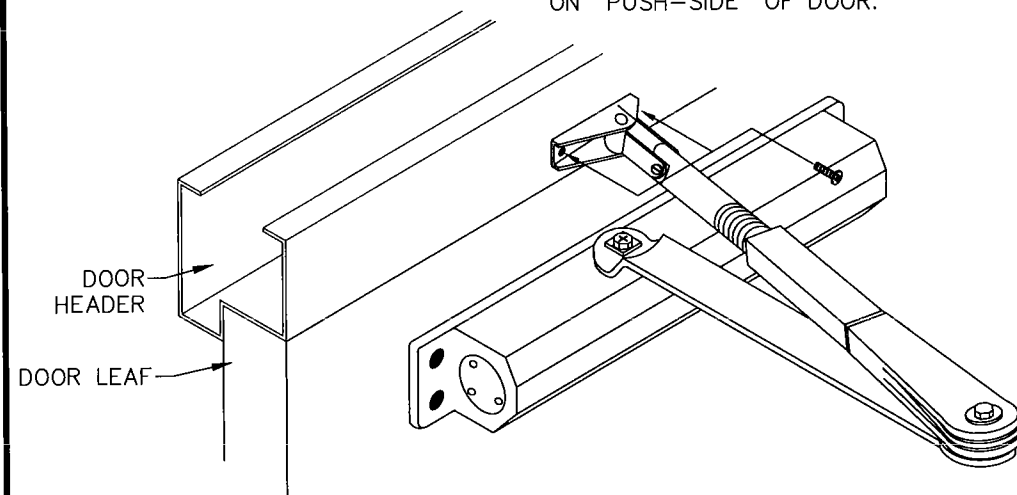
WALL-1



SECTION THRU DOOR LEAF

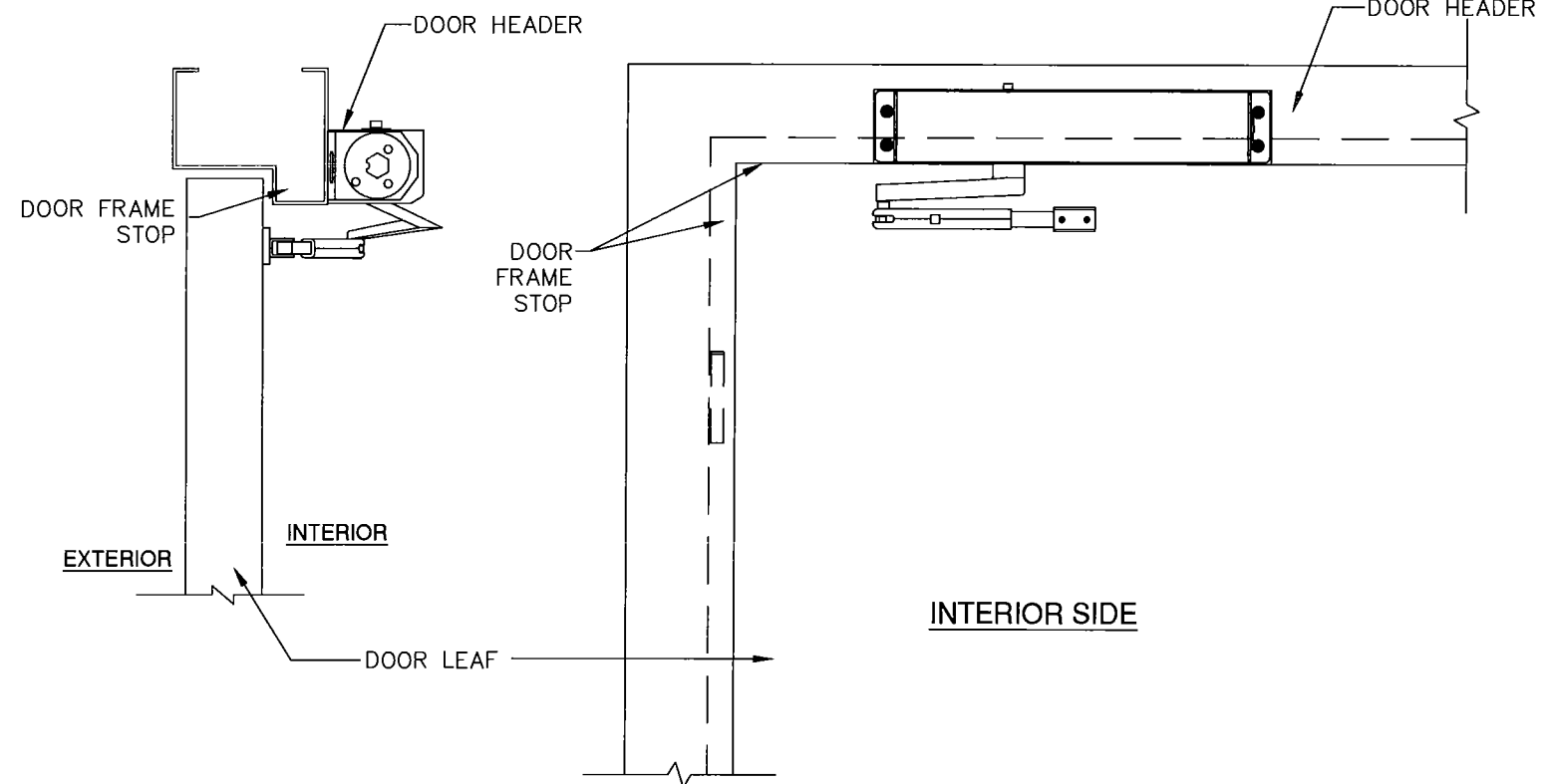


SECTION THRU HEAD



OPTIONAL DOOR CLOSER MOUNTING DETAILS
(FOR SWING-IN DOORS ONLY)

NOTE:
REGULAR ARM MOUNTING OF CLOSER IS
RECOMMENDED WHEN CLOSER IS INSTALLED
ON "PUSH-SIDE" OF DOOR.



NOTES:

- 1). WHEN MEASURING BOTH SIDES OF DOOR, BE SURE TO ALLOW FOR BEVELED EDGE OF DOOR, MAKING CERTAIN THAT HOLES ALIGN.
- 2). REFER TO INSTRUCTIONS PACKED IN DOOR CLOSER BOX FOR CLOSER INSTALLATION DIMENSIONS.

REVISIONS	BY
12-20-10	TLC
02-28-11	TLC
07-06-11	RAP
10-18-11	RAP
06-08-13	TLC
08-15-16	JMC
11-30-16	JMC

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**WALK DOOR CLOSER
INSTALLATION**

DETAILS

DATE 10-21-10

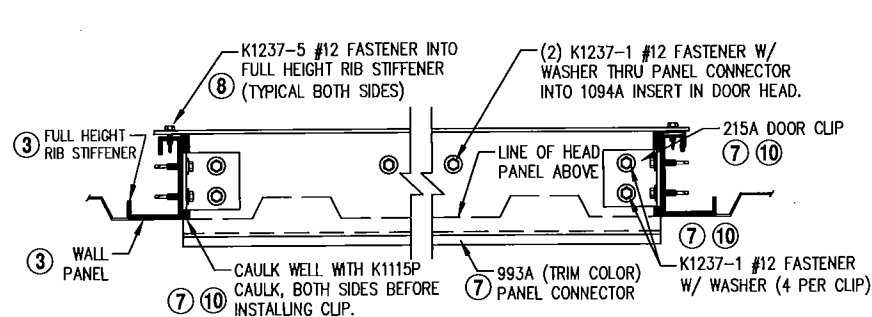
DRAWN BY TLC

SCALE N.T.S.

ORDER NO.

REVISION 7

WD3-CLOS



SECTION 'A'-A'

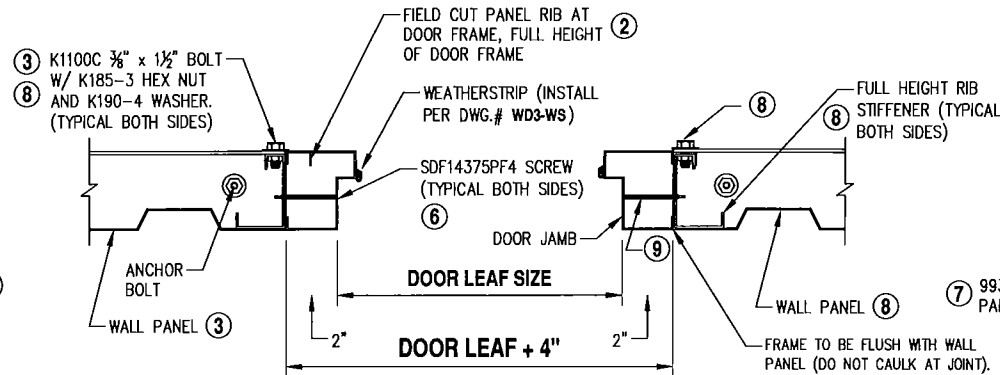
RIB STIFFENER NOTE:

1. FULL HEIGHT RIB STIFFENERS MUST BE INSTALLED IN WALL PANEL RIBS BEFORE INSTALLING ANY TYPE OF WALL CAPS.

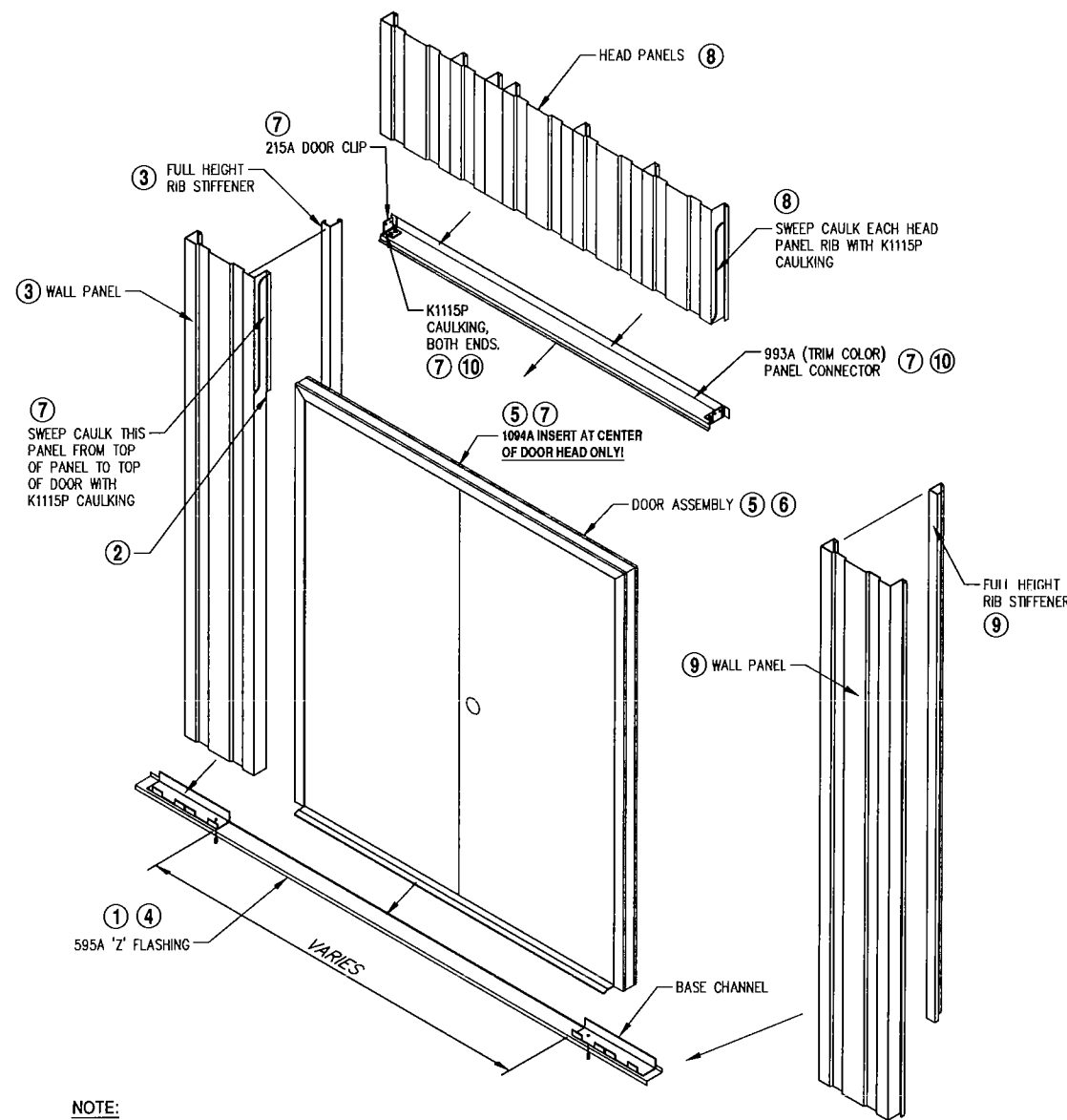
NOTE: IT IS RECOMMENDED TO REMOVE THE DOOR LEAFS PRIOR TO INSTALLATION OF FRAME.

INSTALLATION:

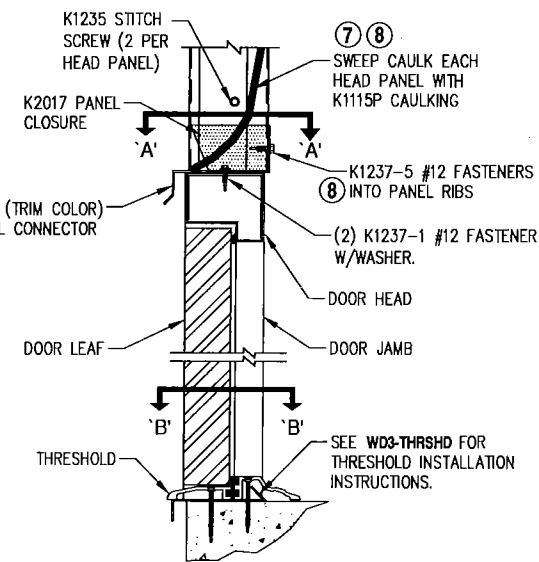
1. MAKE SURE 595A 'Z' FLASHING RUNS CONTINUOUS UNDER DOOR OPENING.
2. FIELD CUT WALL PANEL RIB FROM TOP OF DOOR TO BOTTOM. (SEE SECTION 'B'-B')
3. INSTALL WALL PANEL AND FULL HEIGHT STIFFENER TO LEFT OF DOOR OPENING. (RIB STIFFENER TO BE FIELD CUT AND DRILLED AS REQUIRED) ATTACH AT BOTTOM (SEE SECTION 'B'-B')
4. BEND BACK LEG OF 595A 'Z' FLASHING IN THRESHOLD AREA ONLY. FLASHING TO RUN BELOW DOOR FRAMES. (SEE DWG.# WD3-THRSHD)
5. ASSEMBLE DOOR FRAME AND 1094A INSERT ON GROUND IN FRONT OF DOOR OPENING.
6. PLACE DOOR FRAME INTO PLACE. ATTACH LEFT SIDE DOOR JAMB TO WALL PANEL RIB AND RIB STIFFENER WITH SDF14375PF4 SCREWS THROUGH HOLES IN DOOR JAMB. (SEE SECTION 'B'-B')
7. MAKE SURE THAT THE 1094A INSERT IS CENTERED IN DOOR HEADER. PLACE PANEL CONNECTOR IN PLACE. SWEEP CAULK LEFT WALL PANEL RIB FROM TOP OF PANEL TO PANEL CONNECTOR. (SEE SECTION THRU DOOR) CAULK CONNECTION OF PANEL CONNECTOR TO LEFT WALL PANEL. INSTALL 215A DOOR CLIP TO PANEL CONNECTOR AND LEFT WALL PANEL RIB. (SEE SECTION 'A'-A')
8. INSTALL HEAD PANELS SWEEP CAULKING EACH RIB. ATTACH PANEL CONNECTOR BACK LEG TO PANEL RIBS. (SEE SECTION 'A'-A' AND SECTION THRU DOOR)
9. INSTALL WALL PANEL AND FULL HEIGHT STIFFENER TO RIGHT OF DOOR OPENING. (RIB STIFFENER TO BE FIELD CUT AND DRILLED AS REQUIRED) ATTACH AT BOTTOM (SEE SECTION 'B'-B')
10. ATTACH RIGHT SIDE DOOR JAMB TO WALL PANEL RIB AND RIB STIFFENER WITH SDF14375PF4 SCREWS THROUGH HOLES IN DOOR JAMB (SEE SECTION 'B'-B')
11. CAULK AND ATTACH PANEL CONNECTOR TO RIGHT SIDE AS INSTRUCTED IN #6 ABOVE.
12. FIELD NOTCH DOOR THRESHOLD AS REQUIRED AND INSTALL ACROSS BOTTOM OF DOOR FRAME.
13. INSTALL DOOR LEAVES WITH SUPPLIED HARDWARE. ADJUST AS REQUIRED.



SECTION 'B'-B'



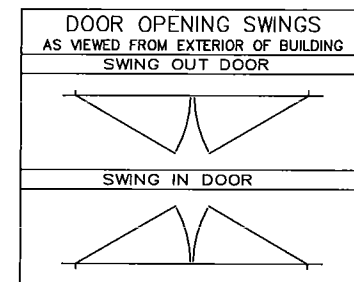
NOTE: SEE "FLASHING DETAIL @ OPENINGS" ON DRAWING# PE-FLASH-1 FOR TUBE SKID APPLICATIONS.



SECTION THRU DOOR

GENERAL NOTES:

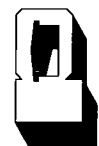
1. RHSO ACTIVE LEAF DOOR ASSEMBLY SHOWN. SEE FLOOR PLAN FOR ACTUAL DOOR SWINGS.
2. SWING IN DOORS REQUIRE DOOR FRAME AND LEAF TO BE REVERSED IN WALL.
3. DOOR FRAMING MUST BE INSTALLED AS WALL PANELS ARE ERECTED.
4. DOOR MUST BE INSTALLED SQUARE AND PLUMB.
5. INSTALL WEATHERSTRIP ON DOOR AS SHOWN IN DETAILS ON DRAWING# WD3-WS.
6. IF DOOR CLOSER IS TO BE INSTALLED, REFER TO DRAWING# WD3-CLOS BEFORE BEGINNING DOOR INSTALLATION.
7. SOME WIDER AND HEAVIER DOOR LEAVES MAY REQUIRE THE INSTALLATION OF A PIVOT HINGE. IF SO SEE DWG# WD3-PIVOT.
8. CHECK INSIDE OF DOOR FRAME FOR ADDITIONAL HARDWARE ITEMS SUCH AS KNOBS, ETC.



NOTE: STANDARD DOORS COME WITH THE RIGHT LEAF ACTIVE. EITHER LEAF CAN BE MADE ACTIVE IF REQUIRED.

REVISIONS	BY
12-15-10	TLC
12-29-10	TLC
05-12-11	RAP
07-22-11	RAP
09-27-11	RAP
01-20-15	DJM
08-30-16	JMC

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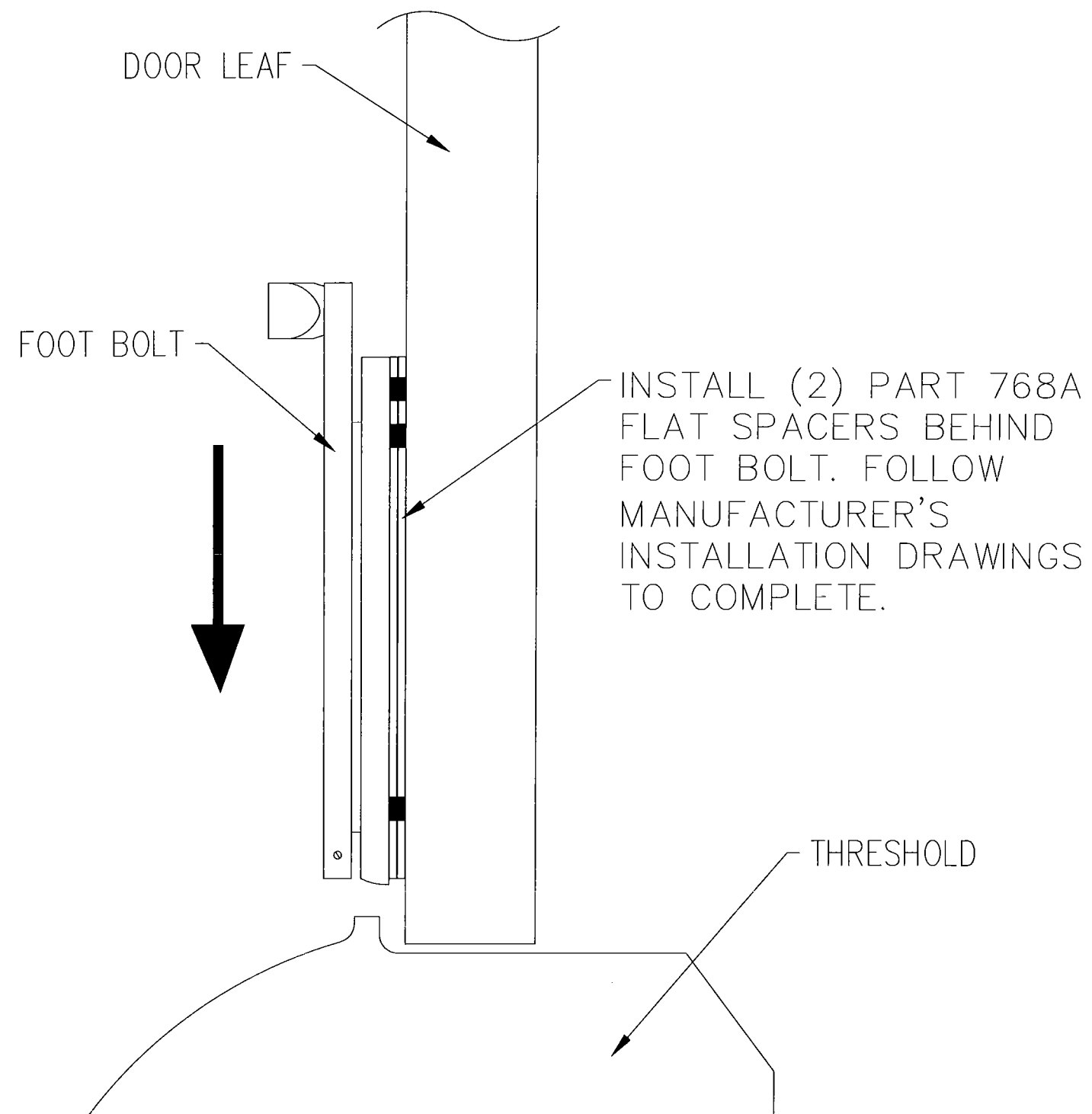


DOUBLE LEAF WALK DOOR WITH 3" DOOR FRAME INSTALLATION

SECTIONS & DETAILS

DATE	11-9-10
DRAWN BY	CBP
SCALE	N.T.S.
ORDER NO.	
REVISION	7

WD3-DBL

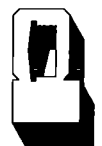


FOOT BOLT SPACER INSTALLATION

DOUBLE SWING DOORS ONLY

REVISIONS	BY
06-29-11	RAP
09-28-11	TLC
08-30-16	JMC

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FAX: 304-586-3842



**WALK DOOR FOOT BOLT
INSTALLATION FOR ALL
DOUBLE LEAF DOORS**

DETAILS

DATE 03-28-11

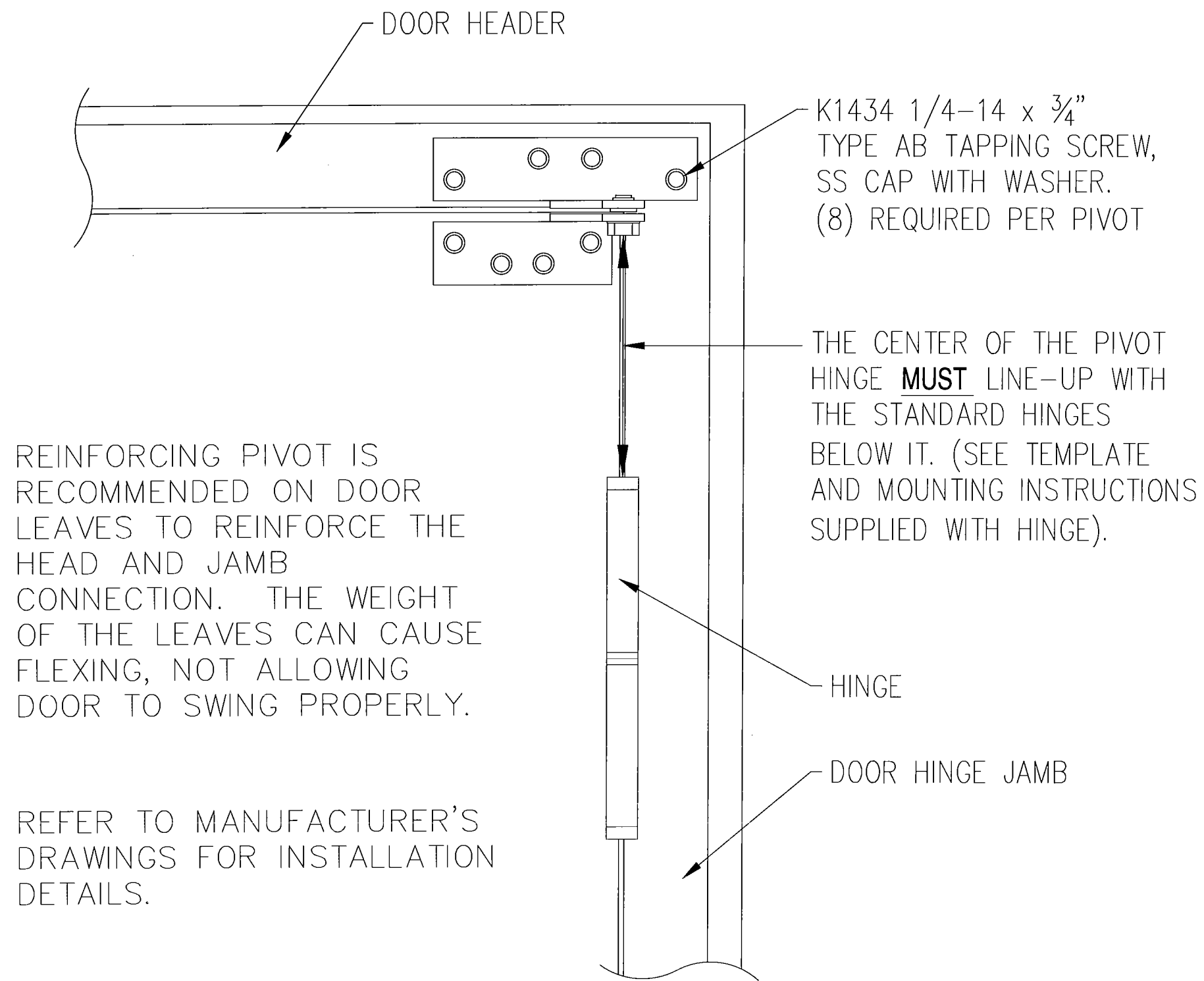
DRAWN BY RAP

SCALE N.T.S.

ORDER NO.

REVISION 3

WD3-FOOT



REINFORCING PIVOT IS RECOMMENDED ON DOOR LEAVES TO REINFORCE THE HEAD AND JAMB CONNECTION. THE WEIGHT OF THE LEAVES CAN CAUSE FLEXING, NOT ALLOWING DOOR TO SWING PROPERLY.

REFER TO MANUFACTURER'S DRAWINGS FOR INSTALLATION DETAILS.

K1434 1/4-14 x 3/4"
TYPE AB TAPPING SCREW,
SS CAP WITH WASHER.
(8) REQUIRED PER PIVOT

THE CENTER OF THE PIVOT
HINGE **MUST** LINE-UP WITH
THE STANDARD HINGES
BELOW IT. (SEE TEMPLATE
AND MOUNTING INSTRUCTIONS
SUPPLIED WITH HINGE).

REINFORCING PIVOT
DOOR LEAF
(EXTERNAL VIEW)

REVISIONS		BY
09-28-11		TLC
08-17-15		JMC
08-15-16		JMC

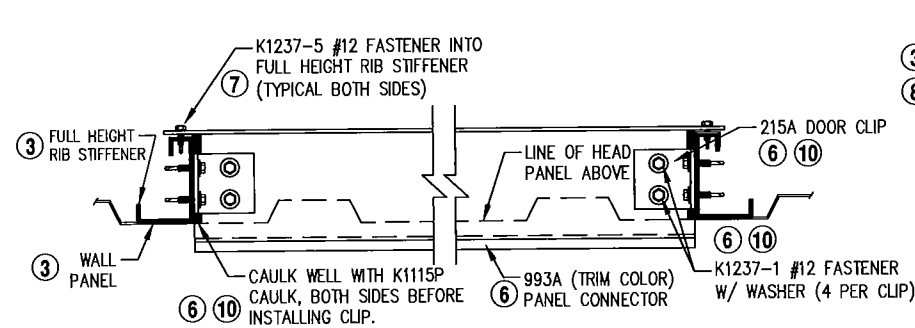
PARKLINE, INC.
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ELEANOR, WV 25070
EMAIL: PARKLINE@PARKLINE.COM
PHONE: 800-786-4855
FAX: 304-586-3842

**REINFORCING PIVOT HINGE
WALK DOOR INSTALLATION
FOR ALL DOORS**

DETAILS

DATE 03-28-11	
DRAWN BY RAP	
SCALE N.T.S.	
ORDER NO.	
REVISION	3

WD3-PIVOT



SECTION 'A'-A'

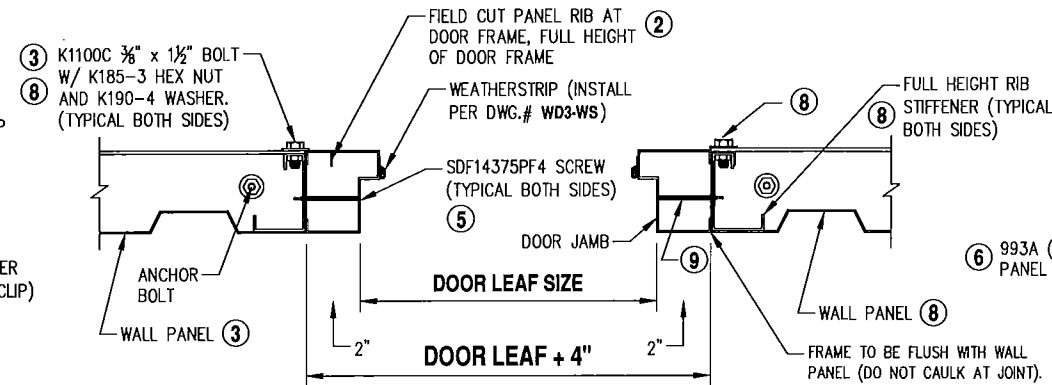
RIB STIFFENER NOTE:

1. FULL HEIGHT RIB STIFFENERS MUST BE INSTALLED IN WALL PANEL RIBS BEFORE INSTALLING ANY TYPE OF WALL CAPS.

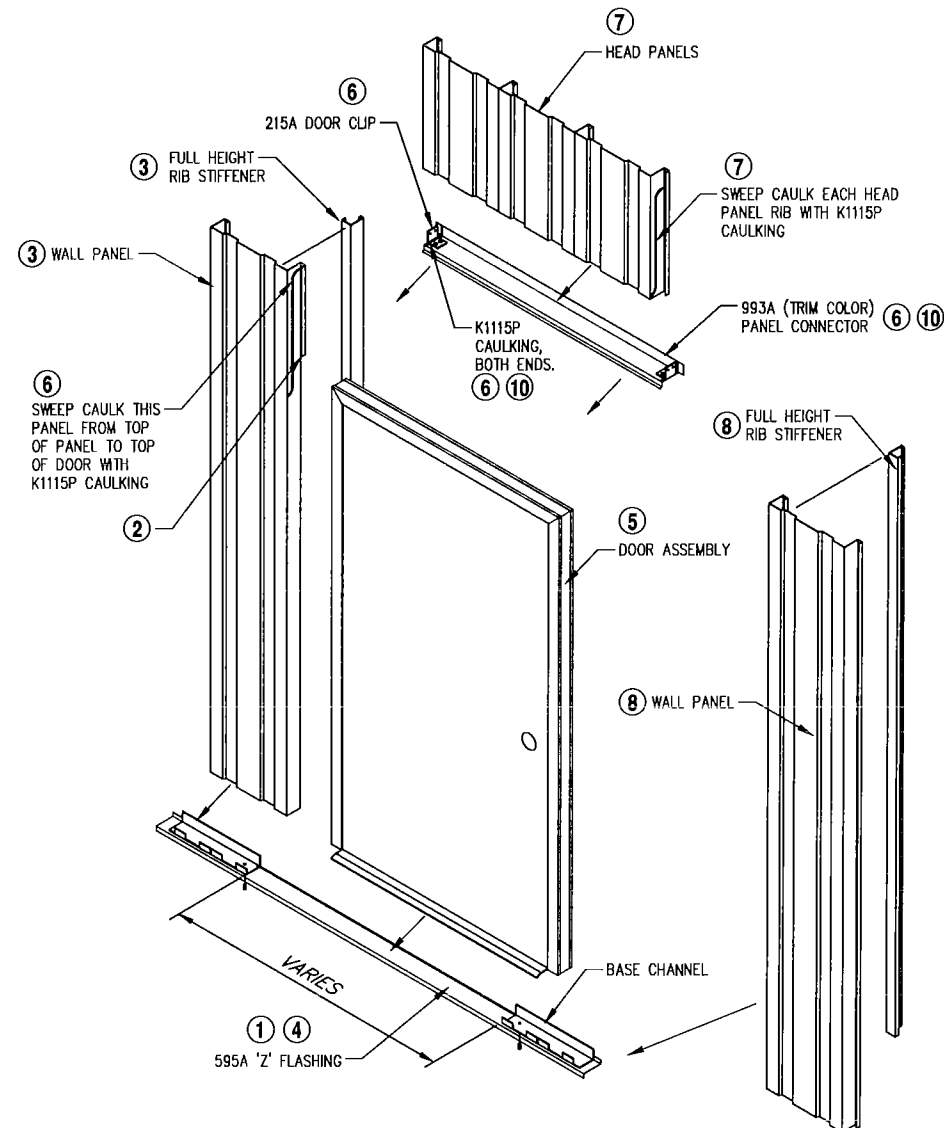
NOTE: IT IS RECOMMENDED TO REMOVE THE DOOR LEAF PRIOR TO INSTALLATION OF FRAME.

INSTALLATION:

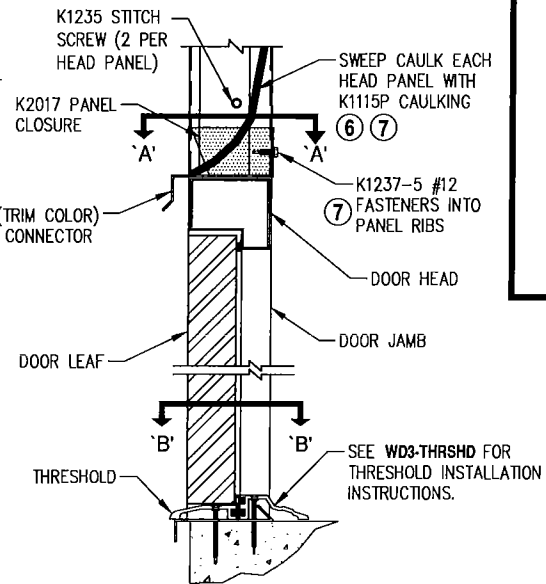
1. MAKE SURE 595A 'Z' FLASHING RUNS CONTINUOUS UNDER DOOR OPENING.
2. FIELD CUT WALL PANEL RIB FROM TOP OF DOOR TO BOTTOM. (SEE SECTION 'B'-B')
3. INSTALL WALL PANEL AND FULL HEIGHT STIFFENER TO LEFT OF DOOR OPENING. (RIB STIFFENER TO BE FIELD CUT AND DRILLED AS REQUIRED) ATTACH AT BOTTOM (SEE SECTION 'B'-B')
4. BEND BACK LEG OF 595A 'Z' FLASHING IN THRESHOLD AREA ONLY. FLASHING TO RUN BELOW DOOR FRAMES. (SEE DWG.# WD3-THRSHD)
5. PLACE DOOR INTO PLACE. ATTACH LEFT SIDE DOOR JAMB TO WALL PANEL RIB AND RIB STIFFENER WITH SDF14375PF4 SCREWS THROUGH HOLES IN DOOR JAMB. (SEE SECTION 'B'-B')
6. PLACE PANEL CONNECTOR IN PLACE. SWEEP CAULK LEFT WALL PANEL RIB FROM TOP OF PANEL TO PANEL CONNECTOR. (SEE SECTION THRU DOOR) CAULK CONNECTION OF PANEL CONNECTOR TO LEFT WALL PANEL. INSTALL 215A DOOR CLIP TO PANEL CONNECTOR AND LEFT WALL PANEL RIB. (SEE SECTION 'A'-A')
7. INSTALL HEAD PANELS SWEEP CAULKING EACH RIB. ATTACH PANEL CONNECTOR BACK LEG TO PANEL RIBS. (SEE SECTION 'A'-A' AND SECTION THRU DOOR)
8. INSTALL WALL PANEL AND FULL HEIGHT STIFFENER TO RIGHT OF DOOR OPENING. (RIB STIFFENER TO BE FIELD CUT AND DRILLED AS REQUIRED) ATTACH AT BOTTOM (SEE SECTION 'B'-B')
9. ATTACH RIGHT SIDE DOOR JAMB TO WALL PANEL RIB AND RIB STIFFENER WITH SDF14375PF4 SCREWS THROUGH HOLES IN DOOR JAMB (SEE SECTION 'B'-B')
10. CAULK AND ATTACH PANEL CONNECTOR TO RIGHT SIDE AS INSTRUCTED IN #6 ABOVE.



SECTION 'B'-B'



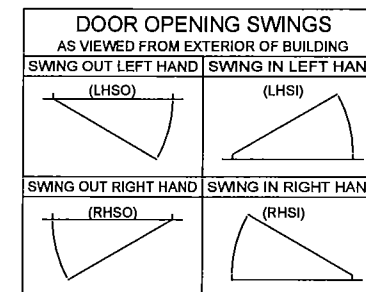
NOTE:
SEE "FLASHING DETAIL @ OPENINGS" ON DRAWING# PE-FLASH-1 FOR TUBE SKID APPLICATIONS.



SECTION THRU DOOR

GENERAL NOTES:

1. LHSO DOOR ASSEMBLY SHOWN, SEE FLOOR PLAN FOR ACTUAL DOOR SWINGS.
2. SWING IN DOORS REQUIRE DOOR FRAME AND LEAF TO BE REVERSED IN WALL.
3. DOOR FRAMING MUST BE INSTALLED AS WALL PANELS ARE ERECTED.
4. DOOR MUST BE INSTALLED SQUARE AND PLUMB.
5. INSTALL WEATHERSTRIP ON DOOR AS SHOWN IN DETAILS ON DRAWING# WD3-WS.
6. IF DOOR CLOSER IS TO BE INSTALLED, REFER TO DRAWING# WD3-CLOS BEFORE BEGINNING DOOR INSTALLATION.
7. SOME WIDER AND HEAVIER DOOR LEAVES MAY REQUIRE THE INSTALLATION OF A PIVOT HINGE. IF SO SEE DWG# WD3-PIVOT.
8. CHECK INSIDE OF DOOR FRAME FOR ADDITIONAL HARDWARE ITEMS SUCH AS KNOBS, ETC.



REVISIONS	BY
12-29-10	TLC
05-12-11	RAP
07-22-11	RAP
09-27-11	RAP
11-16-11	RAP
11-18-11	TLC
01-19-15	JMC
08-15-16	JMC

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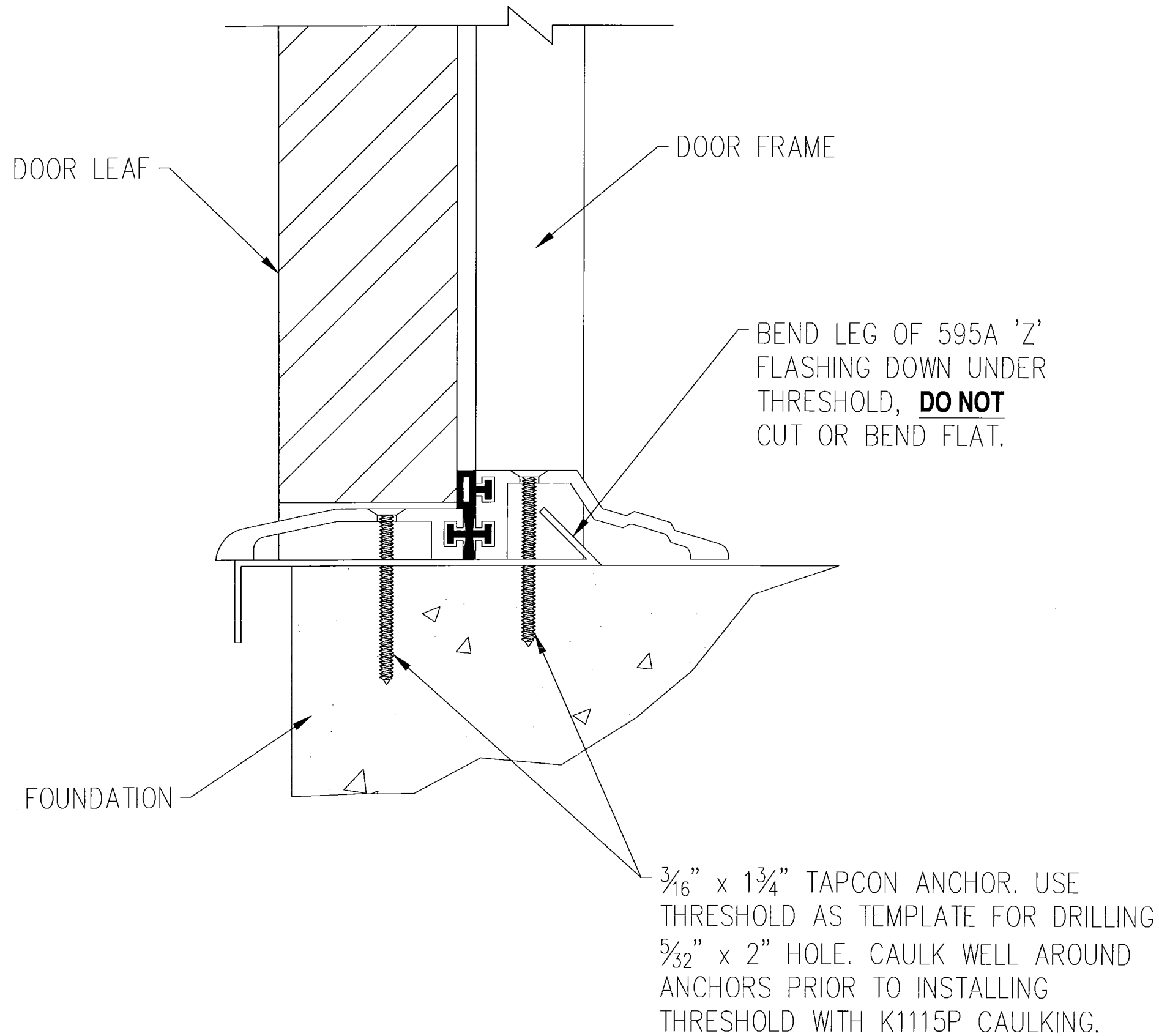


SINGLE LEAF WALK DOOR WITH 3" DOOR FRAME INSTALLATION

SECTIONS & DETAILS

DATE	11-9-10
DRAWN BY	CBP
SCALE	N.T.S.
ORDER NO.	
REVISION	8

WD3-SGL



REVISIONS	BY
06/03/11	RAP
07-25-11	KRK
09-28-11	TLC
09-19-2012	KRK
08-15-16	JMC

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 FAX: 304-586-3842

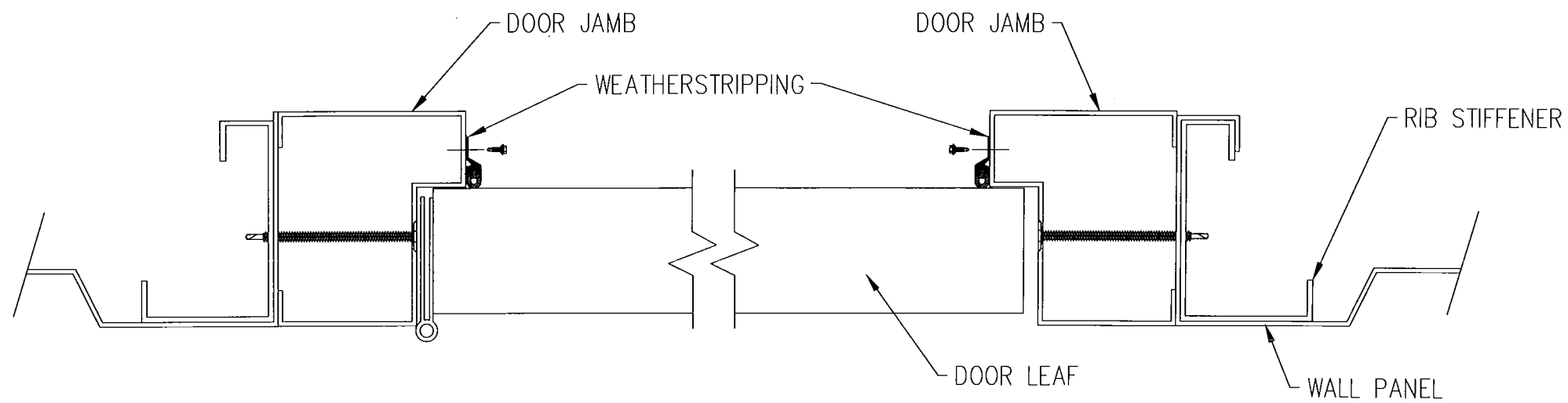


**WALK DOOR THRESHOLD
 INSTALLATION FOR 3"
 DOOR FRAME ONLY**

DETAILS

DATE	04-08-11
DRAWN BY	RAP
SCALE	N.T.S.
ORDER NO.	
REVISION	5

WD3-THRSHD



DOOR WEATHERSTRIPPING DETAIL

WEATHERSTRIPPING INSTALLATION

STEP 1. CUT WEATHERSTRIPPING TO LENGTH AS REQUIRED.

STEP 2. CUT AROUND ANY DOOR BOLTS OR PLATES AS NEEDED.

STEP 3. ATTACH WITH STANDARD SELF DRILLING SCREWS PROVIDED USING PRE-DRILLED HOLES IN WEATHERSTRIPPING AS TEMPLATE.

NOTE:

INSTALLATION AT DOOR HEADER (NOT SHOWN) IS THE SAME AS SHOWN ON JAMBS.

REVISIONS	BY
07-22-11	RAP
09-28-11	TLC
08-15-16	JMC

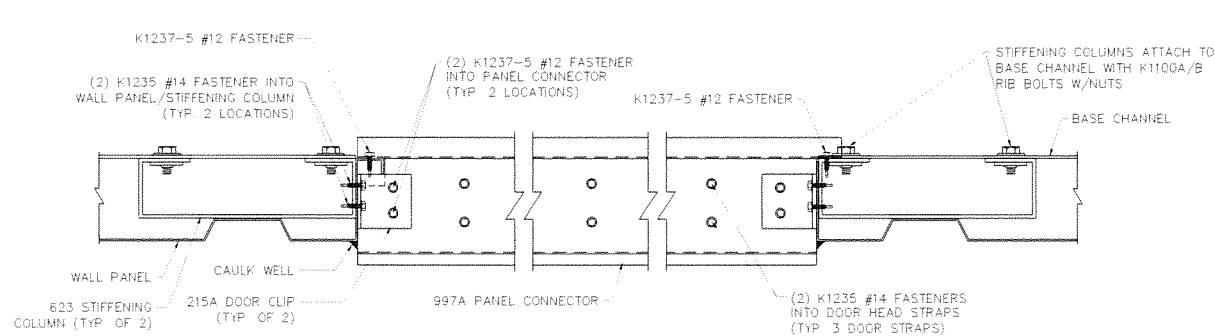
PARKLINE, INC.
 328 INDUSTRIAL PARK DRIVE
 ELEANOR, WV 25070
 EMAIL: PARKLINE@PARKLINE.COM
 PHONE: 800-786-4855
 FAX: 304-586-3842



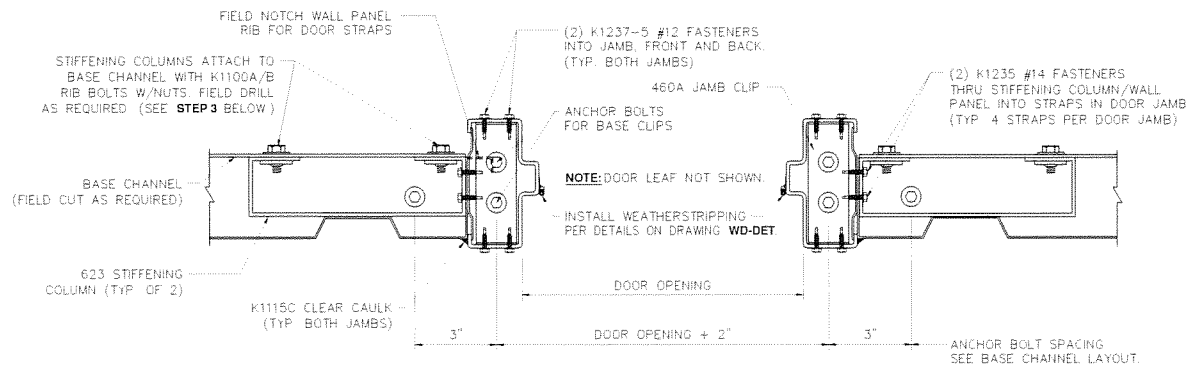
JOB DESCRIPTION	WALK DOOR WEATHERSTRIPPING INSTALLATION FOR 3" DOOR FRAME ONLY	SHEET TITLE	DETAILS

DATE	03-28-11
DRAWN BY	RAP
SCALE	N.T.S.
ORDER NO.	
REVISION	3

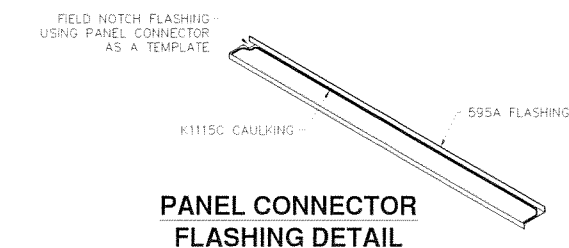
WD3-WS



SECTION 'A'-A'

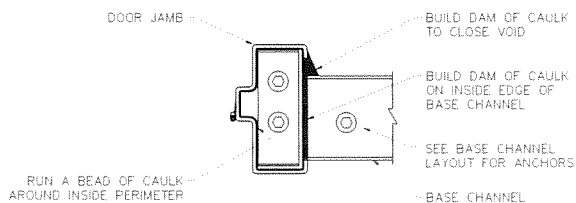


SECTION 'B'-B'

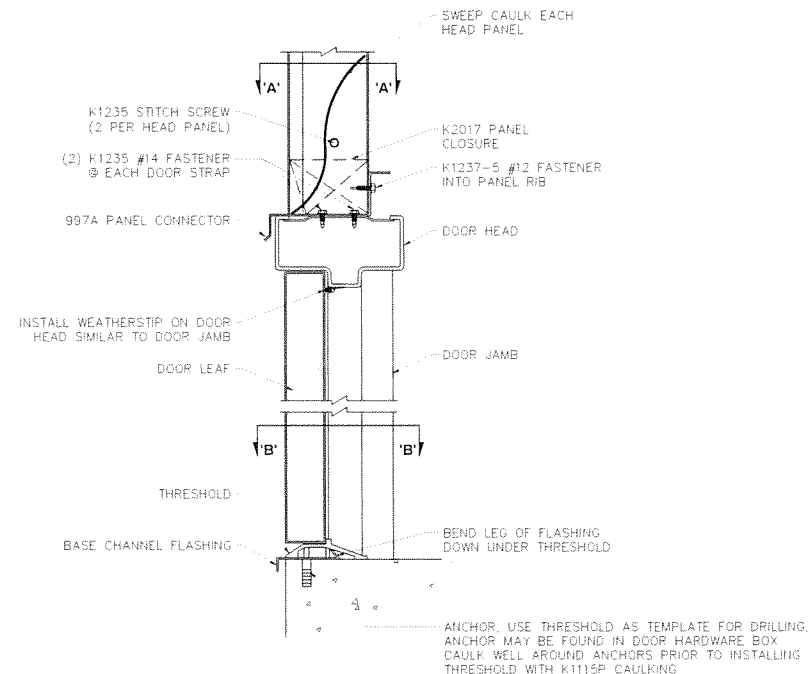


PANEL CONNECTOR FLASHING DETAIL

NOTE:
IF DOOR CLOSER IS TO BE INSTALLED REFER TO DRAWING WD-CLOS BEFORE BEGINNING DOOR INSTALLATION.



TYPICAL CAULKING DETAIL @
BASE OF DOOR JAMB

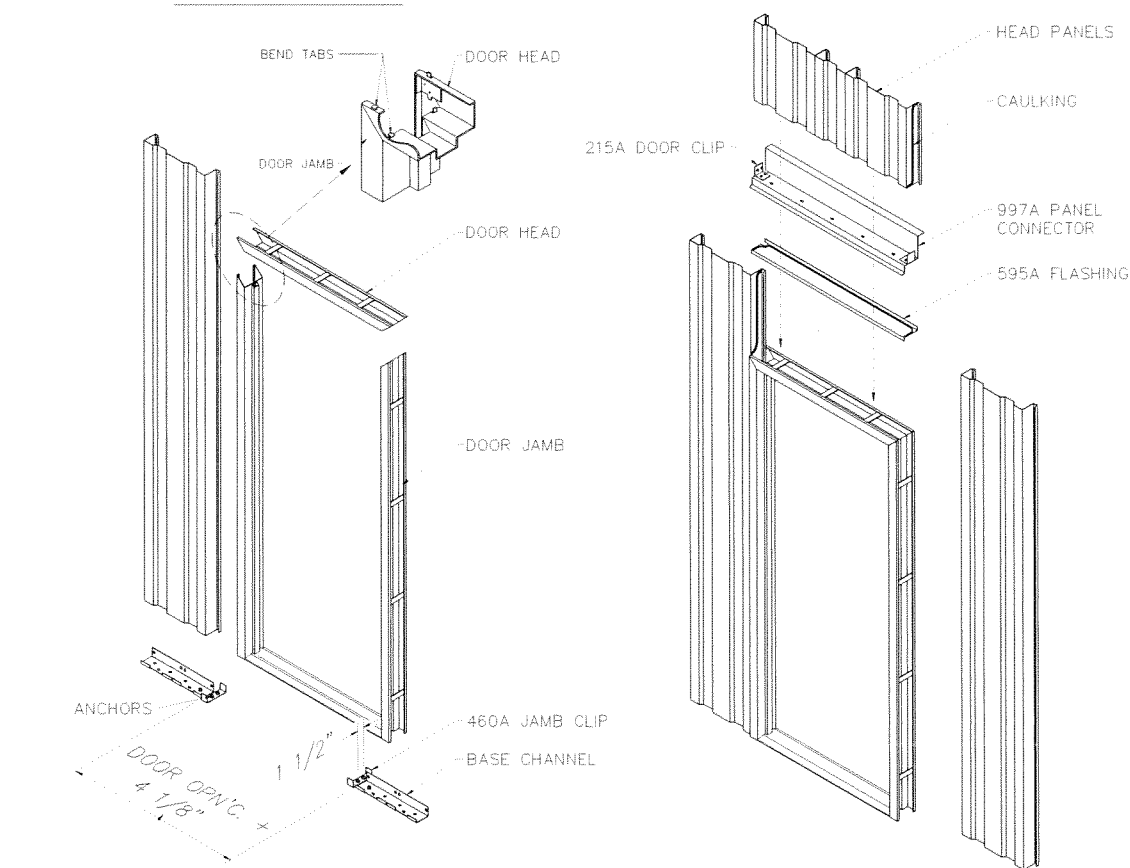


SECTION THRU DOOR

DOOR OPENING SWINGS AS VIEWED FROM EXTERIOR OF BLD'G	
SWING OUT LEFT HAND (LHSO)	SWING OUT RIGHT HAND (LHS)
SWING IN LEFT HAND (RHSO)	SWING IN RIGHT HAND (RHS)

NOTES:

- SEE FLOOR PLAN FOR ACTUAL DOOR SWINGS.
- DOOR FRAMING MUST BE INSTALLED AS WALL PANELS ARE ERECTED.
- DOOR MUST BE INSTALLED SQUARE AND PLUMB.
- INSTALL WEATHERSTRIP ON DOOR AS SHOWN IN DETAILS ON DRAWING WD-DET.
- CHECK INSIDE DOOR FRAME FOR ADDITIONAL HARDWARE ITEMS SUCH AS KNOBS, ETC.



IF DOOR UNIT IS RECESSED IN CURB, USE THIS DIMENSION AS CLEAR CURB OPENING.

STEP 1.

FASTEN JAMB CLIPS TO FOUNDATION (SEE SECTION 'B'-B' AND BASE CHANNEL LAYOUT). ASSEMBLE DOOR JAMBS, HEADER, AND THRESHOLD SET FRAME ASSEMBLY OVER JAMB CLIPS AND FASTEN PER SECTION 'B'-B'. ATTACH DOOR JAMB TO WALL PANEL WITH K1237-5 FASTENERS THRU DOOR JAMB STRAPS (SEE SECTION 'B'-B').

STEP 2.

CAULK PANEL CONNECTOR AND FLASHING PER DETAIL ABOVE. PLACE PANEL CONNECTOR/FLASHING INTO POSITION AND FASTEN TO HEAD. (SEE SECTION 'A'-A') CAULK FROM TOP OF WALL PANEL TO DOOR HEAD AS SHOWN. PLACE HEAD PANELS INTO POSITION AND FASTEN TO BACK OF PANEL CONNECTOR. (SEE SECTION THRU DOOR) SWEEP CAULK EACH HEAD PANEL AS SHOWN, THEN INSTALL PANEL TO RIGHT OF OPENING.

STEP 3.

PLACE STIFFENING COLUMNS IN POSITION AND BOLT TO BASE CHANNEL USING K1100A RIB BOLTS/NUTS. (SEE SECTION 'B'-B') FASTEN DOOR CLIPS AS SHOWN IN SECTION 'A'-A'. INSTALL AND ADJUST DOOR LEAVES FOR PROPER OPERATION. SURFACE CAULK DOOR FRAME TO WALL WITH K1115C CLEAR CAULK AS SHOWN IN SECTION 'B'-B'.

REVISIONS	BY
06-14-2012	RAP
8-13-12	CBP
02-17-15	DJM
12-08-15	JMC
05-18-16	MRW
07-20-18	ABH

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JOB DESCRIPTION
SINGLE LEAF WALK DOOR,
IN HIGH VELOCITY WIND AREA

SHEET TITLE
INSTALLATION DETAILS

DATE 07-27-09

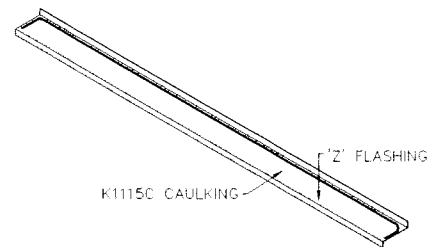
DRAWN BY CEM

SCALE N.T.S.

ORDER NO

REVISION 6

WD-30-HV

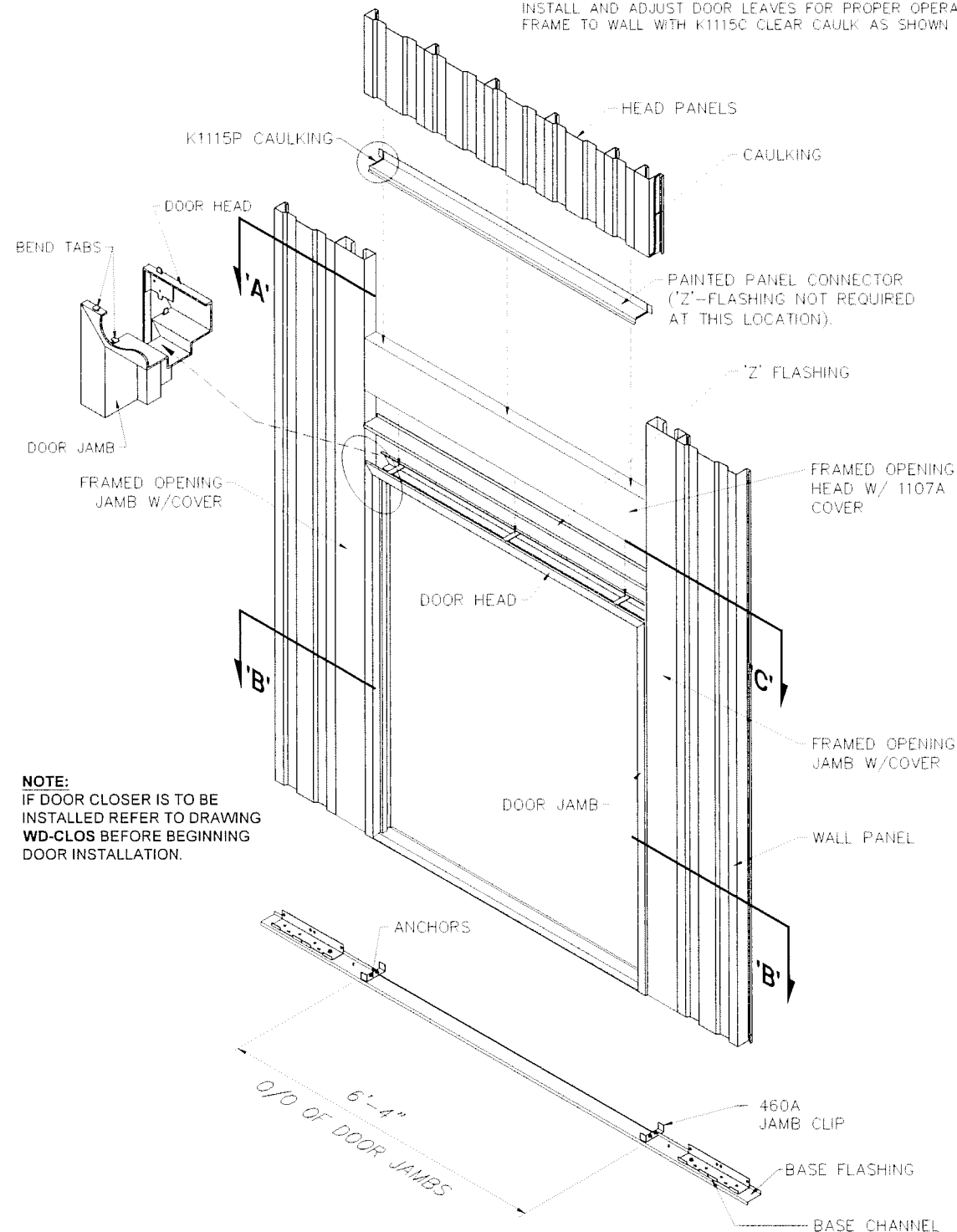


CAULKING DETAIL FOR 'Z' FLASHING BETWEEN DOOR HEAD AND HEAD ASSEMBLY

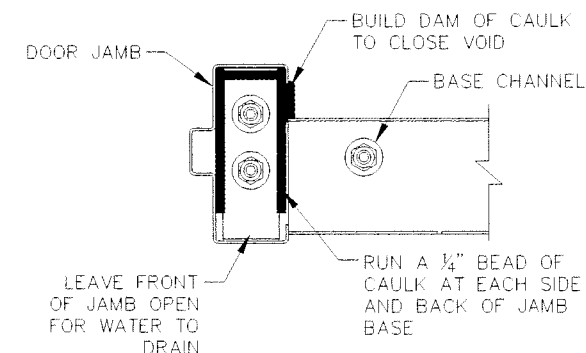
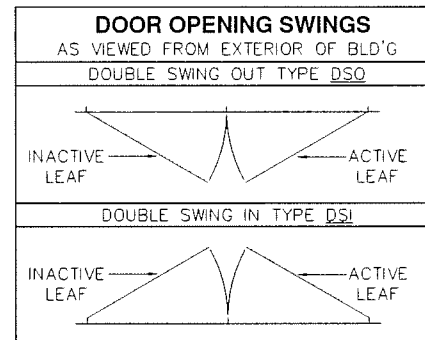
INSTALL FRAMED OPENING PER DRAWING FO-2A AND FO-2B.

- STEP 1.**
FASTEN JAMB CLIPS TO FOUNDATION (SEE SECTION 'B'-B' AND BASE CHANNEL LAYOUT). ASSEMBLE DOOR JAMBS, HEADER, AND THRESHOLD. SET FRAME ASSEMBLY OVER JAMB CLIPS AND FASTEN PER SECTION 'B'-B'. ATTACH DOOR JAMB TO FRAMED OPENING JAMB WITH (2) K1235 1/4" - 14 FASTENERS THRU DOOR JAMB STRAPS. (SEE SECTION 'B'-B')
- STEP 2.**
INSTALL PANEL CONNECTOR PER DETAIL BELOW. PLACE PANEL CONNECTOR INTO POSITION, BETWEEN HEAD PANELS AND FRAMED OPENING HEAD ASSEMBLY. (CAULK PER DETAIL BELOW) SECURE DOOR INTO FRAMED OPENING USING (2) K1235 1/4" - 14 FASTENERS THRU HEAD ASSEMBLY AND FLASHING, INTO EACH DOOR HEAD STRAP. (SEE SECTION 'A'-A') PANEL CONNECTOR TO BE PLACED ABOVE FRAMED OPENING HEAD ASSEMBLY. PLACE HEAD PANELS INTO POSITION AND FASTEN TO BACK OF PANEL CONNECTOR. SWEEP CAULK EACH HEAD PANEL AS SHOWN ON FRAMED OPENING DRAWING.

- STEP 3.**
INSTALL AND ADJUST DOOR LEAVES FOR PROPER OPERATION. SURFACE CAULK DOOR FRAME TO WALL WITH K1115C CLEAR CAULK AS SHOWN IN SECTION 'B'-B'.

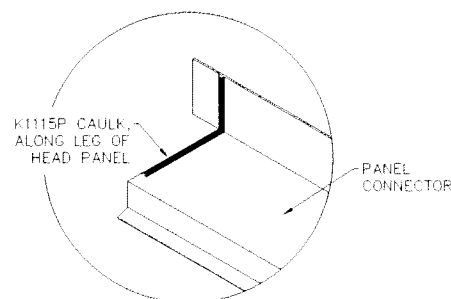


NOTE:
IF DOOR CLOSER IS TO BE INSTALLED REFER TO DRAWING WD-CLOS BEFORE BEGINNING DOOR INSTALLATION.

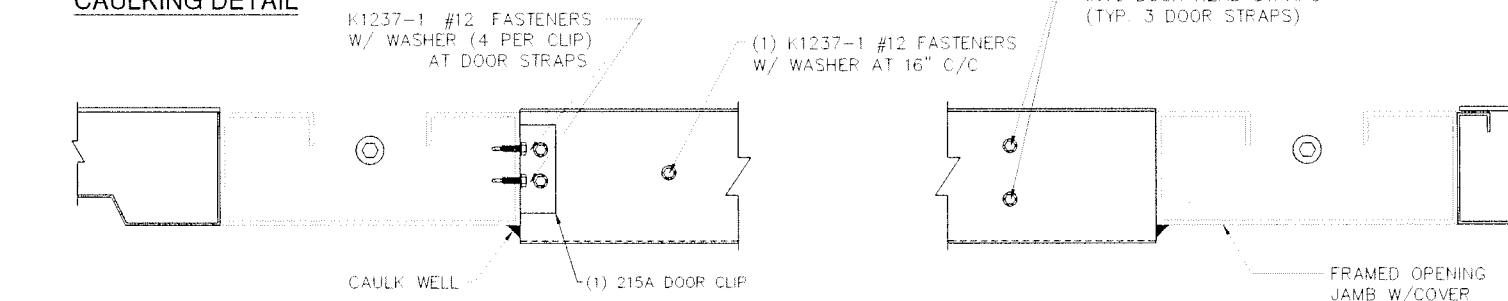


TYPICAL CAULKING DETAIL @ BASE OF DOOR JAMB

- NOTES:**
1. DOUBLE DOORS CANNOT BE SHIPPED COMPLETELY PREASSEMBLED. FIELD ASSEMBLY OF FRAME AND LEAF UNITS IS REQUIRED.
 2. DOUBLE SWING OUT DOOR ASSEMBLY SHOWN. SEE ORDER SPECIFIC DRAWINGS TO CONFIRM TYPE OF DOOR.
 3. DOOR FRAMING MUST BE INSTALLED AS WALL PANELS ARE ERECTED.
 4. DOOR MUST BE INSTALLED SQUARE AND PLUMB.
 5. INSTALL WEATHERSTRIP ON DOOR AS SHOWN IN DETAILS ON DRAWING WD-DET.
 6. CHECK INSIDE DOOR FRAME FOR ADDITIONAL HARDWARE ITEMS SUCH AS KNOBS, ETC.

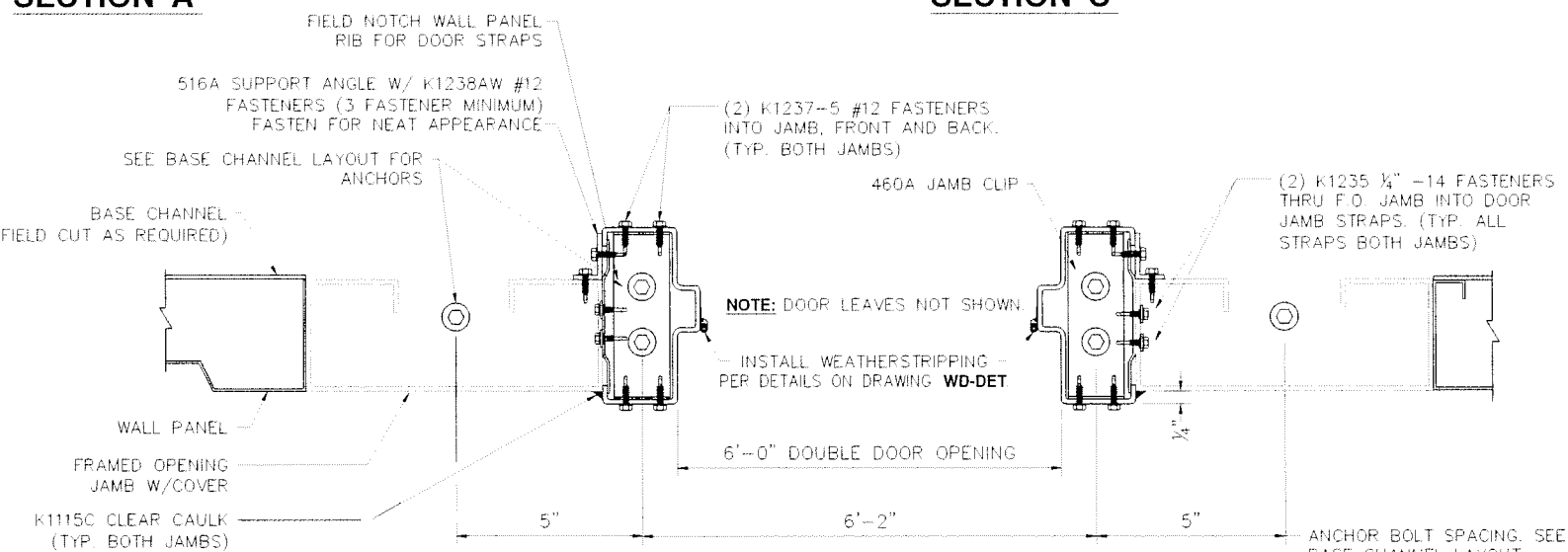


CAULKING DETAIL



SECTION 'A'

SECTION 'C'

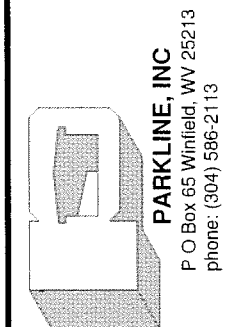


NOTE: DOOR LEAVES NOT SHOWN

INSTALL WEATHERSTRIPPING - PER DETAILS ON DRAWING WD-DET

SECTION 'B'-B'

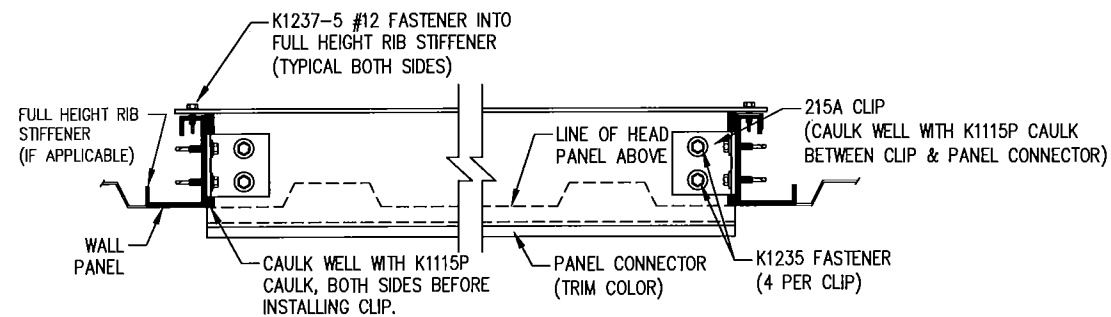
REVISIONS	BY
01-28-08	CEM
07-27-09	CEM
08-19-10	RAP
08-27-10	RAP
03-06-12	TLC
03-14-13	TLC
02-17-15	DJM
01-21-16	JMC
07-18-18	ABH



JOB DESCRIPTION	SHEET TITLE
6'-0" WIDE WALK DOOR, IN HIGH VELOCITY WIND AREA, FOR 10'-0" EAVE HT. BUILDINGS	INSTALLATION DETAILS

DATE	06-13-06
DRAWN BY	CEM
SCALE	N.T.S.
ORDER NO	
REVISION	9

WD-60-HV10

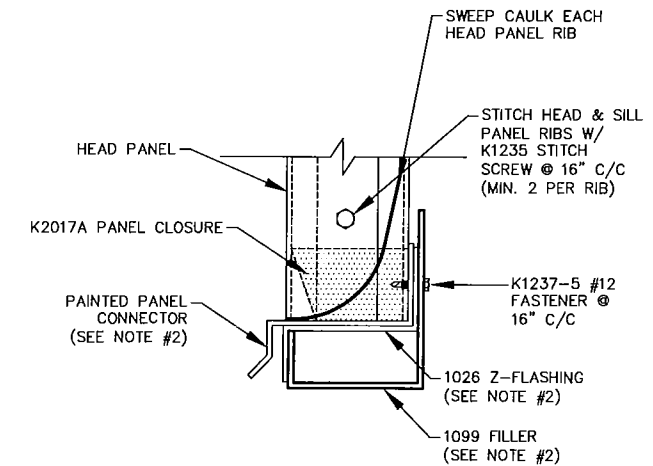
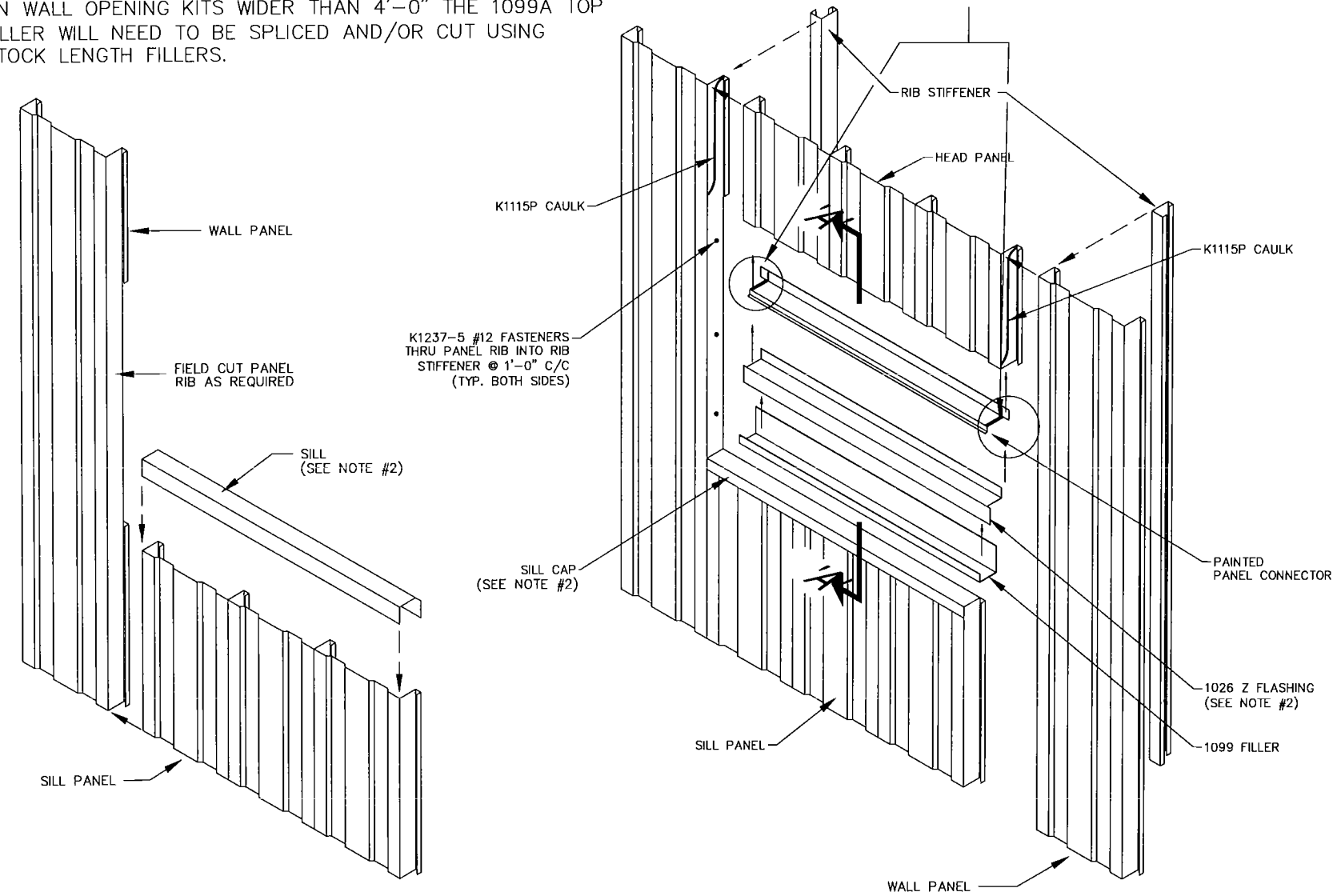


TYPICAL SECTION @ PANEL CONNECTOR

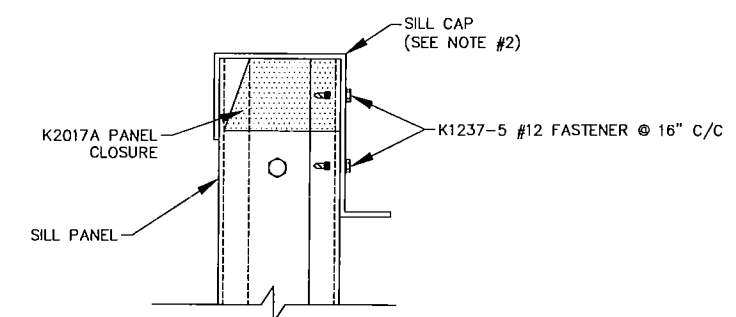
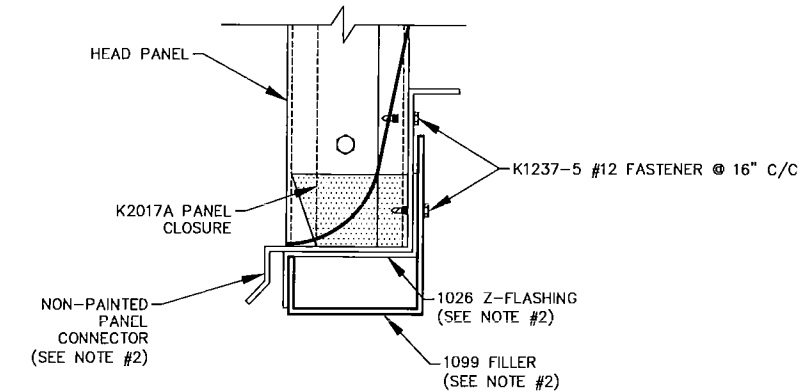
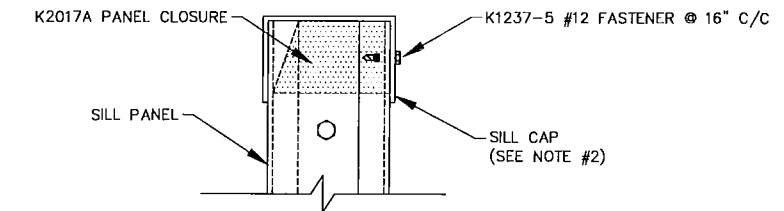
NOTES:

- 1). WALL OPENING KITS FOR CUSTOMER SUPPLIED ACCESSORIES MUST BE FIELD LOCATED, CUT AND FLASHED UNLESS PRIOR ARRANGEMENTS ARE MADE WITH PARKLINE. FOR FACTORY CUTTING OF THESE OPENINGS, THE EXACT LOCATION AND FINISHED OPENING SIZES MUST BE PROVIDED TO PARKLINE.
- 2). FOR NON STANDARD WIDTH WALL OPENING KITS STOCK LENGTH PANEL CONNECTORS, 'Z' FLASHING FILLER AND SILL CAPS MUST BE FIELD CUT TO FIT OPENING.
- 3). ON WALL OPENING KITS WIDER THAN 4'-0" THE 1099A TOP FILLER WILL NEED TO BE SPICED AND/OR CUT USING STOCK LENGTH FILLERS.

MAKE SURE TO CAULK EACH END OF PANEL CONNECTOR TO LEFT AND RIGHT WALL PANEL RIBS AFTER PANEL CONNECTOR IS IN PLACE.



SECTION 'A' (ASSEMBLED)
(FOR 1'-4" , 2'-8" & 4'-0" WIDE)



SECTION 'A' (ASSEMBLED)
(FOR 5'-4" & 6'-8" WIDE)

REVISIONS	BY
1-30-95	JEH
10-16-95	CEM
11-8-95	EAB
7-14-97	CBP
2-26-03	DLR
01-18-05	RAP
12-20-07	RAP
06-30-10	RAP
08-24-10	RAP
05-18-16	MRW

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JOB DESCRIPTION
**BASIC WALL OPENING KIT
INSTALLATION DETAILS**

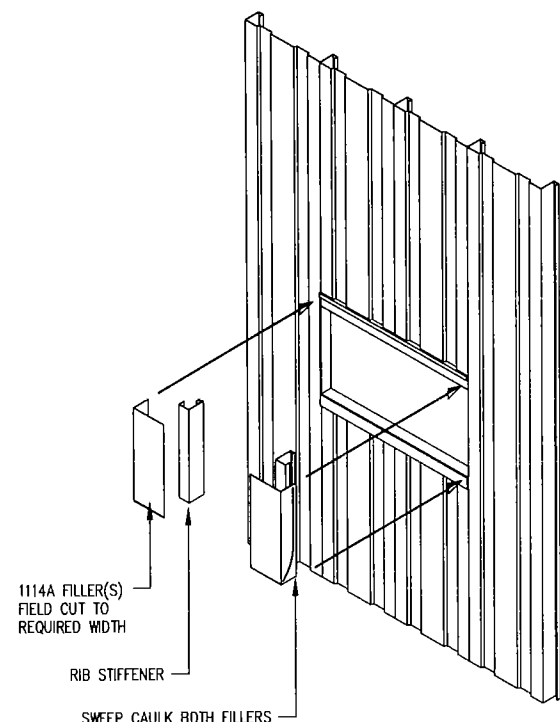
SHEET TITLE
SECTIONS AND DETAILS

DATE	12-15-94
DRAWN BY	KRK
SCALE	NTS
ORDER NO.	
REVISION	15

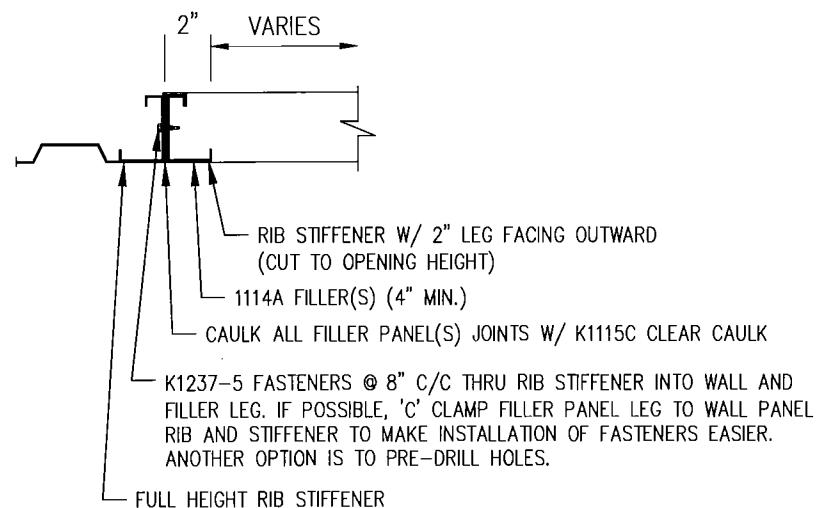
WOK

NOTES:

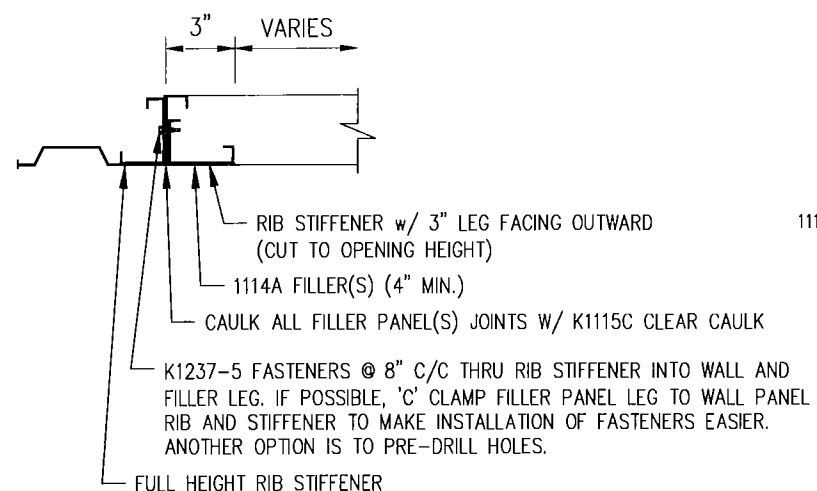
1. WALL OPENING KITS W/ PARTIAL FILLERS ALLOW FIELD INSTALLATION OF EXHAUST FANS, LOUVERS, HVAC UNITS, ETC. WITHOUT AFFECTING STRUCTURAL STABILITY OF BUILDING WALL.
2. INSTALL BASIC WALL OPENING KIT PER DWG # WOK.
3. 2'-8" WIDE OPENING IS SHOWN. DETAILS APPLY TO ALL WIDTH WALL OPENINGS.
4. FILLER SIZE WILL VARY DEPENDING ON FINISH OPENING HEIGHT REQUIRED.
5. CUT RIB STIFFENER TO OPENING SIZE AND INSTALL W/ 330A CLIPS & K1237-5 FASTENERS AS SHOWN IN SECTIONS.
6. SWEEP CAULK JOINTS OF WALL OPENING TO FILLERS W/ K1115C CLEAR CAULK.



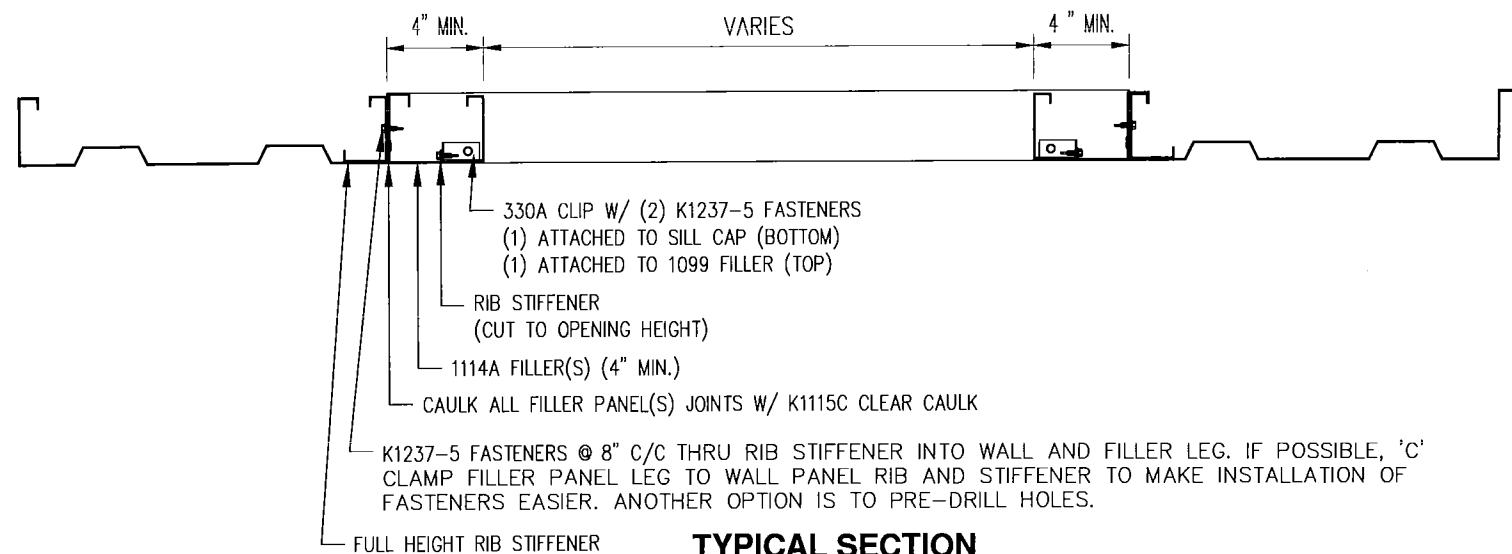
EXTERIOR VIEW



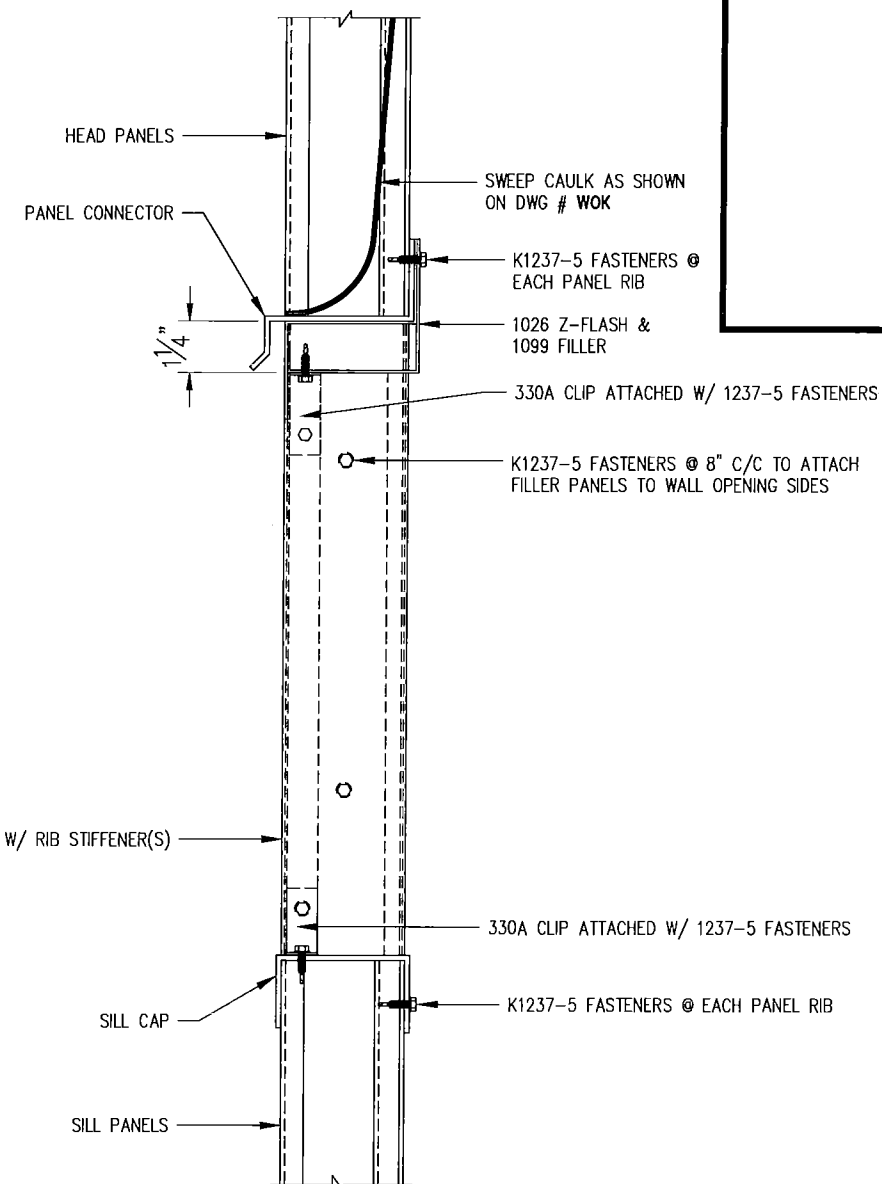
TYPICAL SECTION
FOR 2" WIDE FILLER



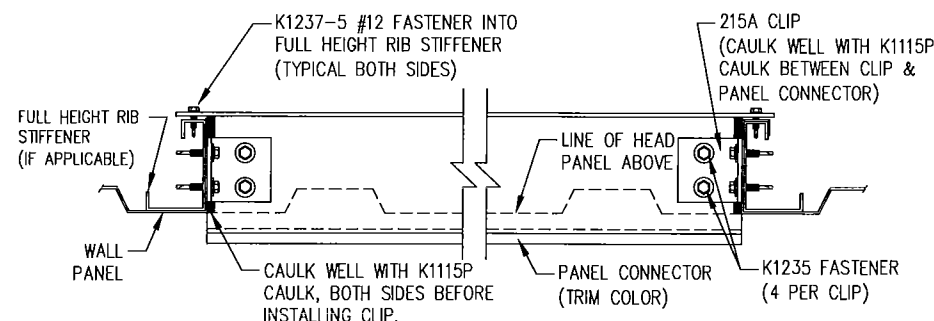
TYPICAL SECTION
FOR 3" WIDE FILLER



TYPICAL SECTION
FOR 4" OR MORE WIDE FILLER



VERTICAL SECTION



TYPICAL SECTION @ PANEL CONNECTOR

REVISIONS	BY
05-24-11	RAP
05-26-11	KRK
02-27-12	TLC
09-22-13	TLC
05-18-16	MRW

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JOB DESCRIPTION
**WALL OPENING KIT
W/ FILLER INSTALLATION**

SHEET TITLE
SECTIONS & DETAILS

DATE	03/15/11
DRAWN BY	KRK
SCALE	NTS
ORDER NO.	
REVISION	5

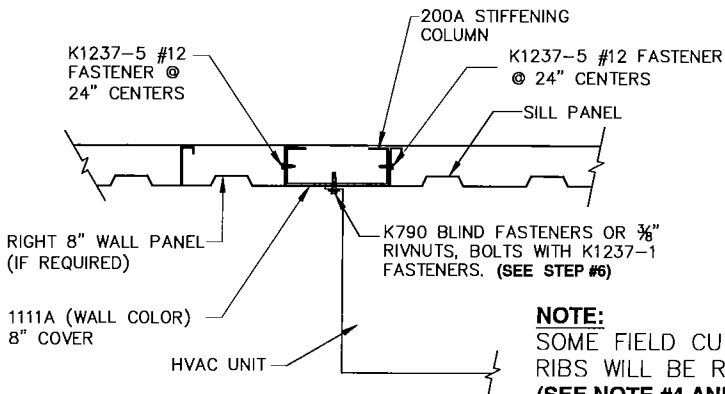
WOK-FIL-2

NOTES:

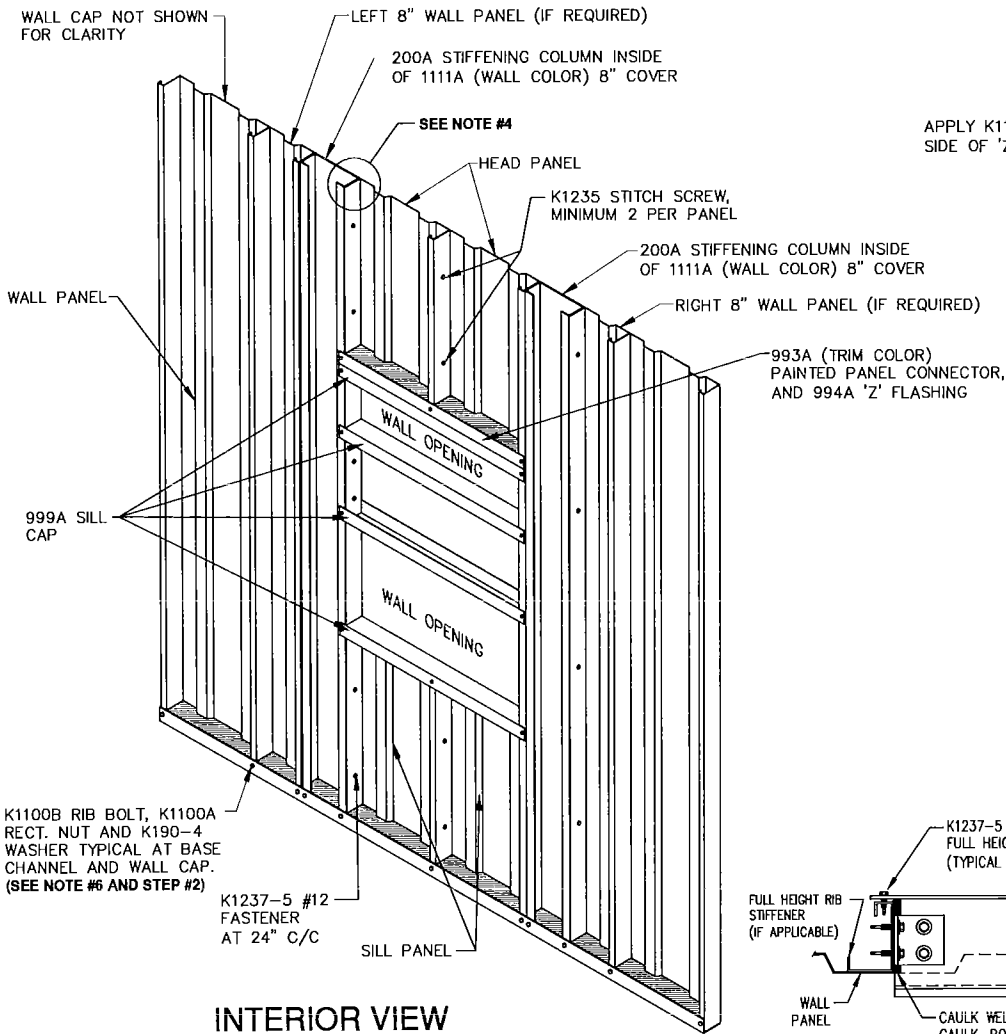
1. THIS HVAC UNIT **CAN NOT BE INSTALLED NEXT TO A CORNER PANEL!!!** THERE **MUST** BE AT **LEAST 8"** BETWEEN CORNER PANEL AND HVAC OPENINGS.
2. PAY CLOSE ATTENTION TO CAULKING DETAILS ON DRAWING #WOK, SWP-1 AND THIS DRAWING
3. INSTALL BASIC WALL OPENING PER DRAWING #WOK EXCEPT REPLACE THE STANDARD RIB STIFFENERS WITH THE 200A STIFFENING COLUMNS. DETERMINE LOCATION OF INTERMEDIATE SILL CAPS AS SHOWN FOR SUPPORT OF LINER PANELS. ATTACH AT EACH END WITH K1237-5 #12 FASTENERS AT PANEL RIBS.
4. FIELD CUT ANY PANEL RIB THAT INTERFERES WITH THE 200A STIFFENING COLUMN.
5. IF THE BUILDING USES FLAT NON EMBOSSED WALL PANELS REPLACE THE 1111A 8" COVERS WITH 1113A COVERS.
6. FIELD DRILL HOLES AS REQUIRED FOR THE 3/8" RIB BOLTS AT COLUMN LOCATIONS.
7. HVAC UNIT SHOWN IS FOR EXAMPLE PURPOSES ONLY. IF HVAC IS NOT PROVIDED BY PARKLINE, CHECK FOR ADDITIONAL INSTRUCTIONS PACKAGED WITH UNIT.

INSTALLATION STEPS:

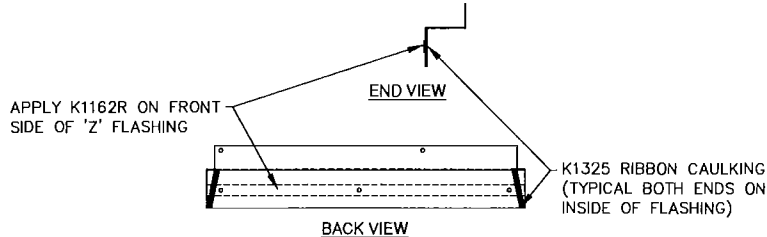
1. INSTALL BASIC WALL OPENING FOR HVAC OPENING AS SHOWN ON DRAWING #WOK, WITH CHANGES PER **NOTE #3** AND DETAILS ON THIS DRAWING. OMIT STANDARD RIB STIFFENERS AND INSTALL 200A STIFFENING COLUMNS WITH 1111A 8" COVERS ON EACH SIDE OF OPENINGS. 1111A COVERS ARE PROVIDED IN STANDARD LENGTHS. FIELD CUTTING OR SPLICING MAY BE REQUIRED. SOME FIELD CUTTING OF PANEL RIBS WILL BE REQUIRED. (SEE **NOTE #4**)
2. BOLT COLUMNS TO WALL CAP (NOT SHOWN) AND BASE CHANNEL WITH RIB BOLTS, NUTS AND WASHERS. FIELD DRILL AS REQUIRED.
3. FASTEN PANEL LEGS TO STIFFENING COLUMNS WITH K1237-5 #12 FASTENERS @ 24" C/C.
4. FASTEN RIBS OF HEAD AND SILL PANELS WITH K1235 STITCH SCREWS. (MINIMUM 2 PER PANEL)
5. INSTALL FOAM TAPE PER **SECTION THRU HEAD**. WHEN INSTALLING HVAC INTO OPENING, RAISE UNIT UNTIL TOP OF SUPPLY AIR OPENING CONTACTS BOTTOM EDGE OF 'Z' FLASHING. THIS ALIGNS TOP LEDGE OF HVAC CABINET WITH HOLES IN 'Z' FLASH.
6. HVAC UNIT INSTALLED ON SITE IS ATTACHED TO WALL WITH A COMBINATION OF (4) K790 BLIND FASTENERS, (2 PER SIDE - FIELD DRILLING REQUIRED), AND K1237-1 #12 FASTENERS @ 12" C/C EACH SIDE. HVAC UNIT INSTALLED AT PARKLINE IS ATTACHED TO WALL WITH A COMBINATION OF (6) 3/8" "RIVNUTS" WITH 3/8" BOLTS, (3 PER SIDE - FIELD DRILLING REQUIRED), AND K1237-1 #12 FASTENERS @ 12" C/C EACH SIDE.
7. INSTALL (3) K1235 FASTENERS AND CAULK WITH K1115C. SEE **SECTION THRU HEAD**.



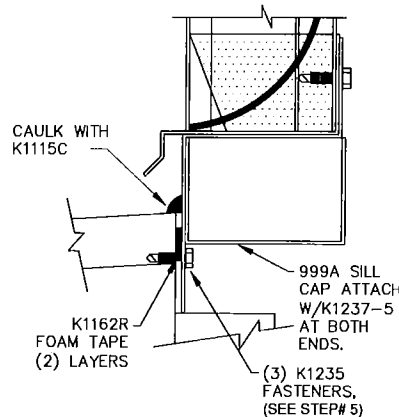
HORIZONTAL SECTION THRU HVAC UNIT



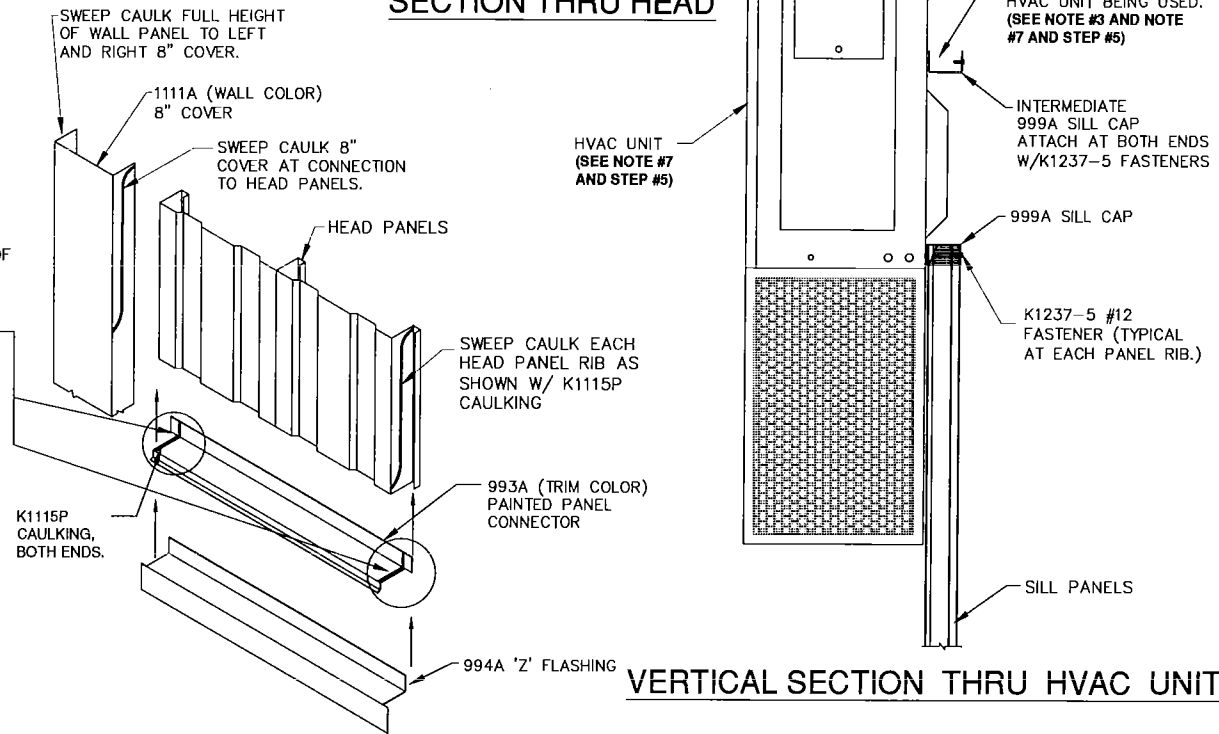
INTERIOR VIEW



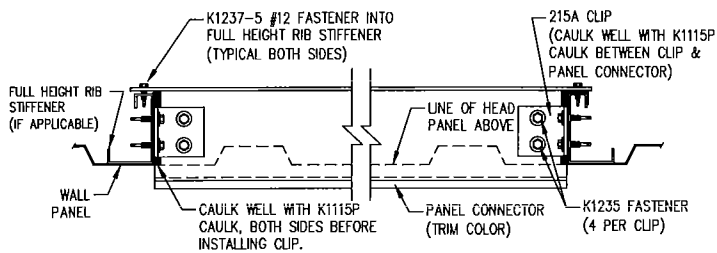
'Z' FLASHING CAULKING DETAIL



SECTION THRU HEAD



VERTICAL SECTION THRU HVAC UNIT



TYPICAL SECTION @ PANEL CONNECTOR

CAULKING DETAIL

REVISIONS	BY
12-28-07	RAP
01-10-08	RAP
11-12-08	KRK
04-17-09	JMC
05-06-09	JMC
06-18-09	CS
11-03-09	JMC
06-30-10	RAP
08-15-16	JMC
10-10-16	DJP

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WALL MOUNTED HVAC
UNIT WALL OPENING
INSTALLATION

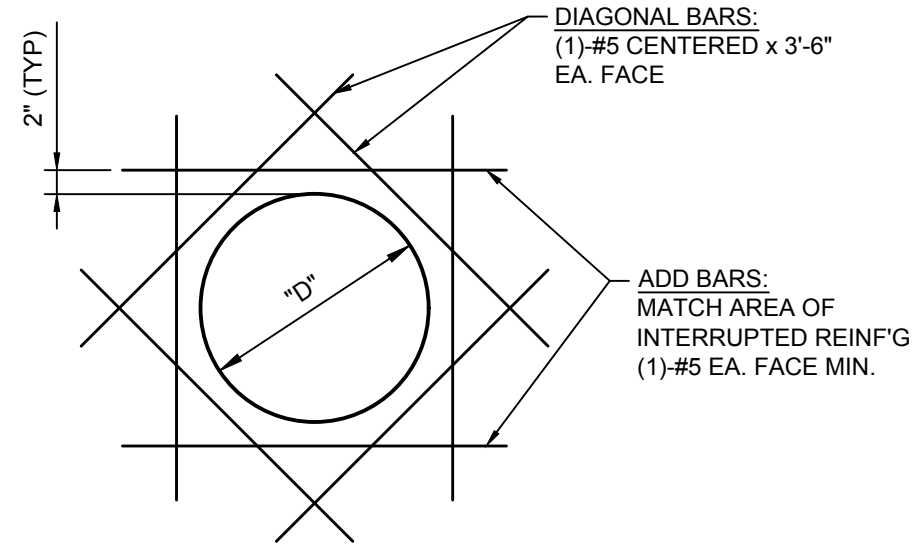
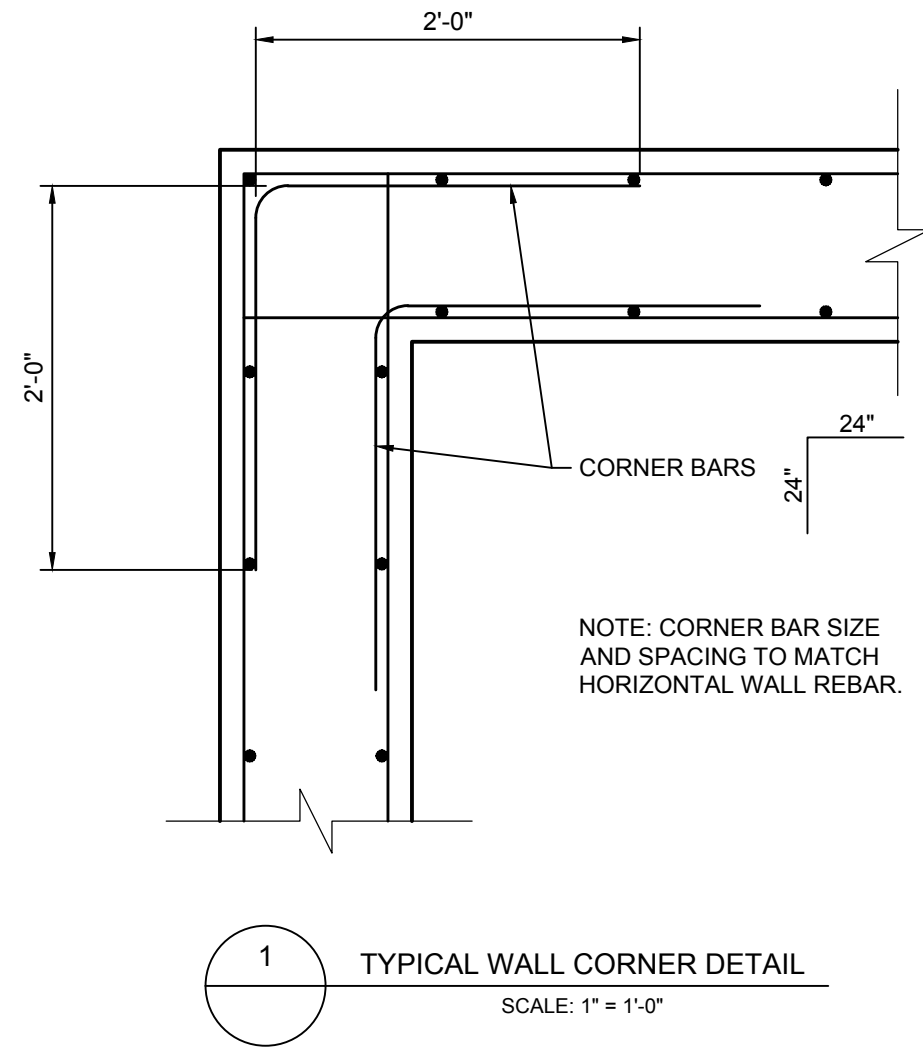
SECTIONS AND DETAILS

DATE	02-06-98
DRAWN BY	CBP
SCALE	NTS
ORDER NO.	
REVISION	18

WOK-HVAC

	LOGO	INFO	BURNS & McDONNELL 275 EAST ST 20TH FLOOR PORTLAND, ME 04101 207-517-8460
			/2019

ANSI D 12/17/2019

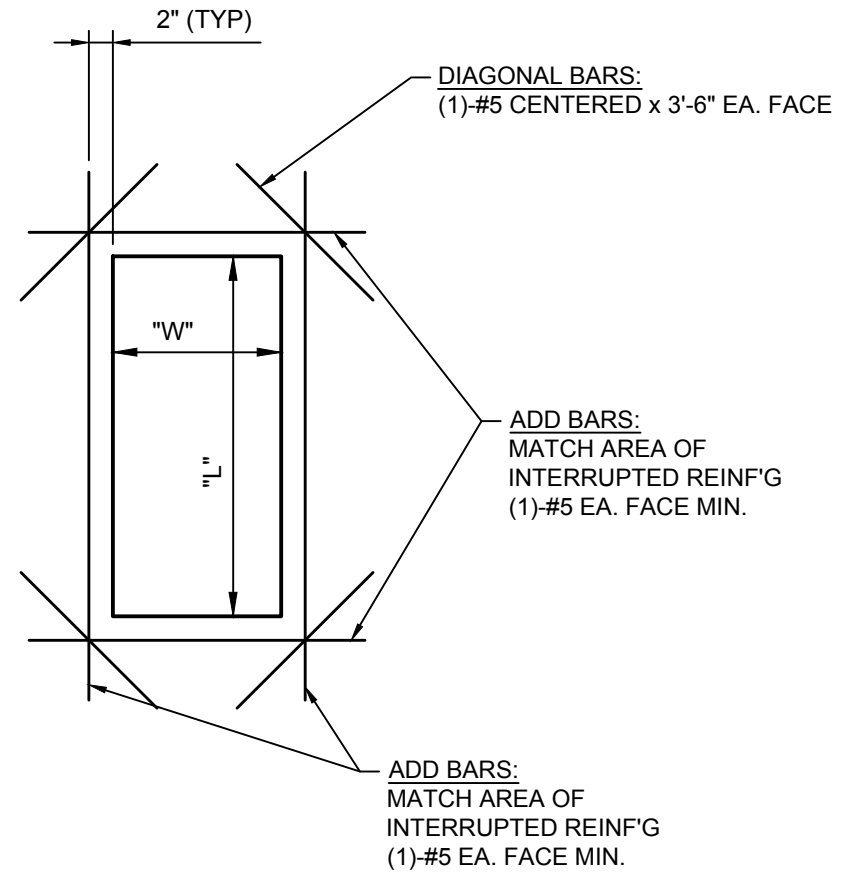


NOTES:

1. MINIMUM LENGTH OF ALL BARS SHALL BE "D" + 3'-6" WITH BARS CENTERED ON OPENING.
2. FOR OPENINGS LESS THAN 6" IN DIAMETER, THE ADJ. BARS ARE NOT REQUIRED IF NO REINFORCING IS CUT BY THE OPENING.
3. REINFORCE OPENINGS WITH "D" LARGER THAN 3'-0" AS INDICATED ON THE DRAWINGS. IF NOT INDICATED, CONTACT THE ENGINEER.
4. REINFORCING SHOWN REPRESENTS THE MINIMUM REQUIRED AT ALL WALL OPENINGS UNLESS OTHERWISE NOTED.
5. FIELD TO INSTALL WATERSTOP PER PHYSICAL DRAWINGS (ROXTEC RS100, ROXTEC RS255-250 OR APPROVED EQUAL).
6. FIELD TO ADJUST VERTICAL AND HORIZONTAL REINFORCEMENT AS NEEDED WHILE PLACING PVC CONDUIT SLEEVES TO MAINTAIN MINIMUM EDGE CLEARANCES.

TYPICAL CIRCULAR WALL
PENETRATION DETAIL

N.T.S.

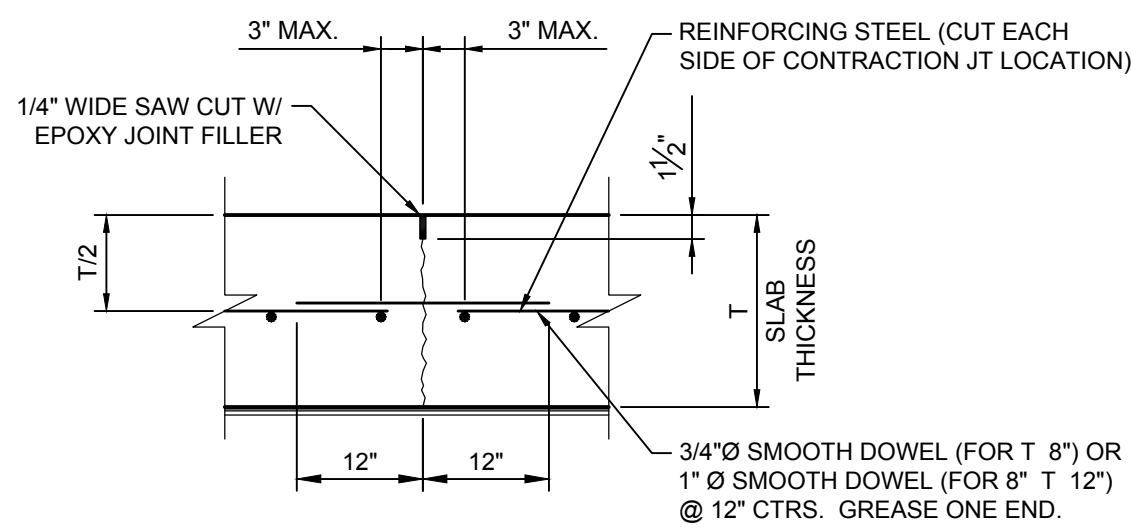


NOTES:

1. ALL MINIMUM LENGTHS TO BE (L OR W) + 3'-6" WITH BARS CENTERED ON OPENING.
2. FOR OPENING (W, L) LESS THAN 8", THE ADD BARS ARE NOT REQUIRED IF NO REINFORCING IS CUT BY THE OPENING.
3. REINFORCE OPENINGS WITH "L" OR "W" LARGER THAN 3'-0" AS INDICATED ON THE DRAWINGS. IF NOT INDICATED, CONTACT THE ENGINEER.
4. REINFORCING SHOWN REPRESENTS THE MINIMUM REQUIRED AT ALL OPENINGS UNLESS OTHERWISE NOTED.

TYPICAL RECTANGULAR WALL PENETRATION DETAIL

N.T.S.

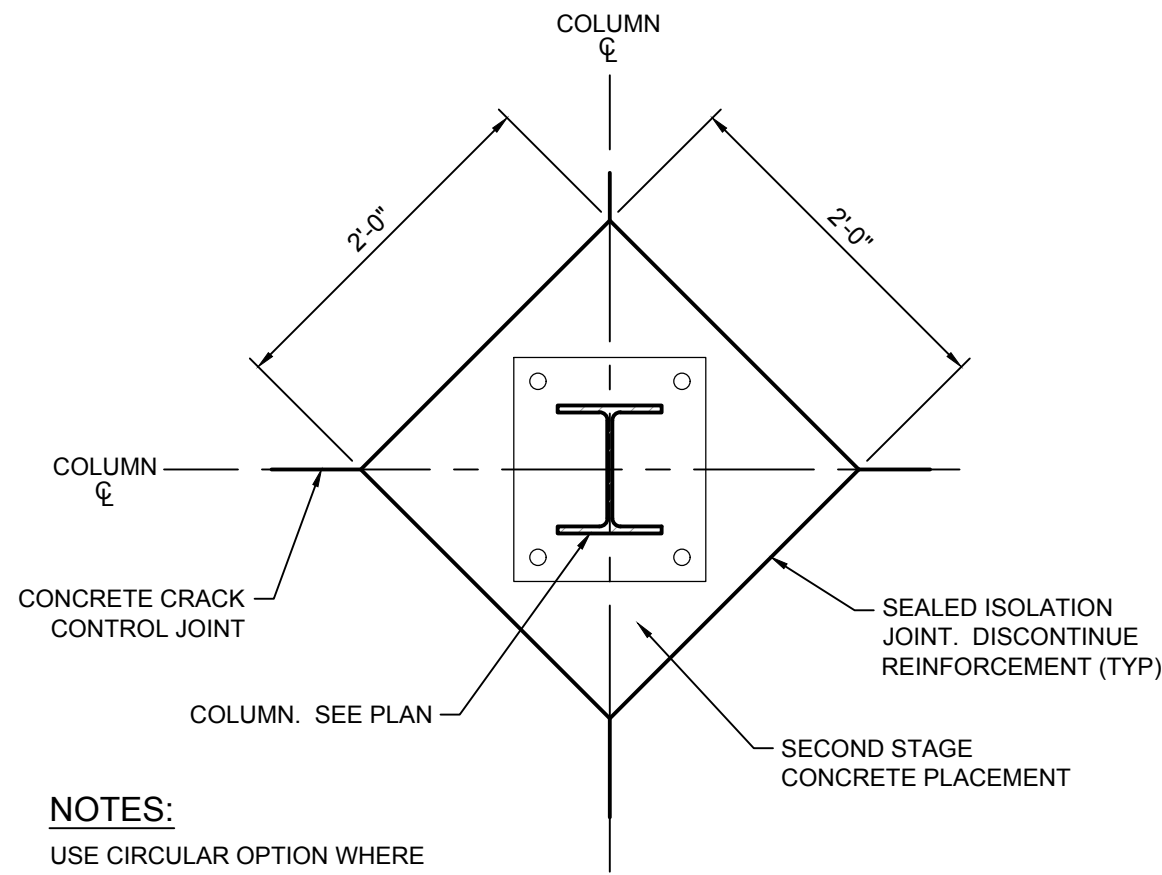


NOTES:

1. EPOXY JOINT FILLER TO BE SIKADUR 51SL BY SIKA CORPORATION OR APPROVED EQUAL. MINIMUM AGE OF CONCRETE TO BE 28 DAYS WHEN FILLED.
2. SAW CUT JOINT AS SOON AS SURFACE IS FIRM ENOUGH TO NOT BE TORN OR DAMAGED BY THE BLADE (USUALLY 4 TO 12 HOURS AFTER CONCRETE SETS).

CONTRACTION JOINT DETAIL

N.T.S.

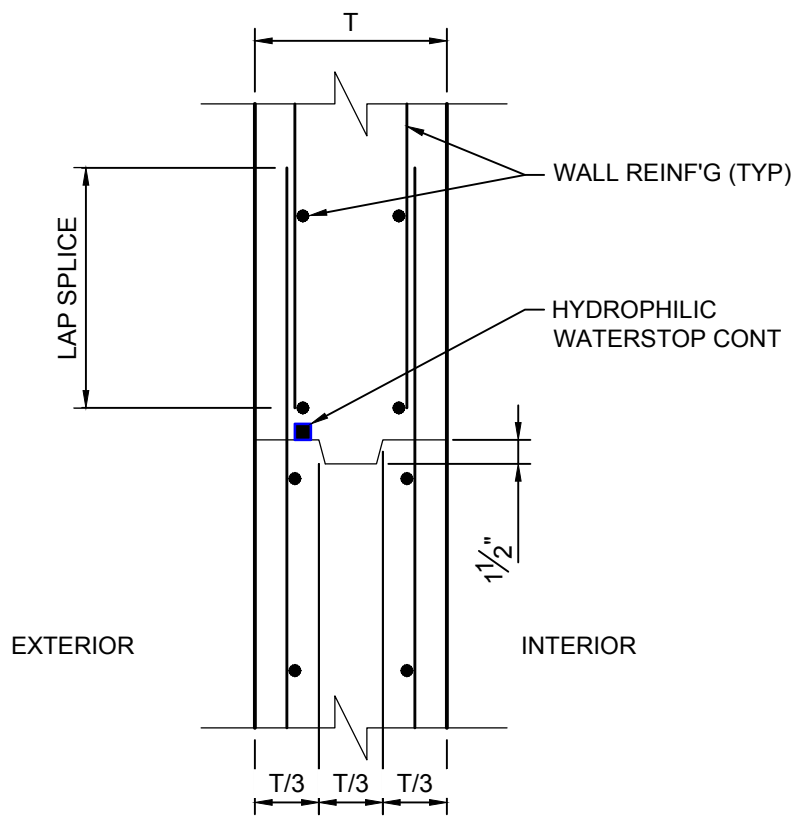


COLUMN ISOLATION JOINTS

N.T.S.

NOTES:

USE CIRCULAR OPTION WHERE
NO FLOOR JOINTS INTERSECT.



NOTES:

1. USE FOR ALL VERTICAL CONSTRUCTION JOINTS IN CONCRETE WALLS.
2. SUBMIT PROPOSED WALL CONST JT LAYOUT FOR APPROVAL PRIOR TO FORMWORK ERECTION.

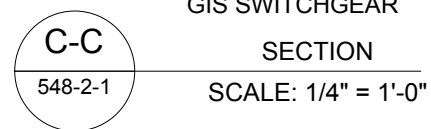
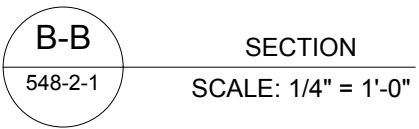
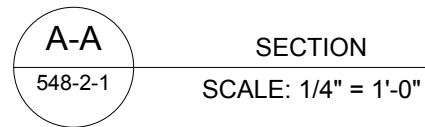
TYPICAL WALL CONSTRUCTION JOINT

N.T.S.

FOR PERMITTING
PURPOSES ONLY
NOT FOR CONSTRUCTION

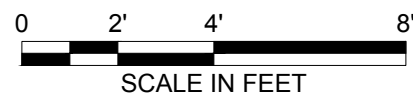
[illegible]

0-0C	ISSUED FOR PERMITTING	12/16/2019	ASG	RS	SM
0-0B	60% ABOVE GROUND IFR	11/26/2019	GWK	RS	SM
0-0A	30% ABOVE GROUND IFR	12/14/2018	NJM	SM	ML
REV	DESCRIPTION	DATE	BY	CK	APP

ANSI D 12/16/2019

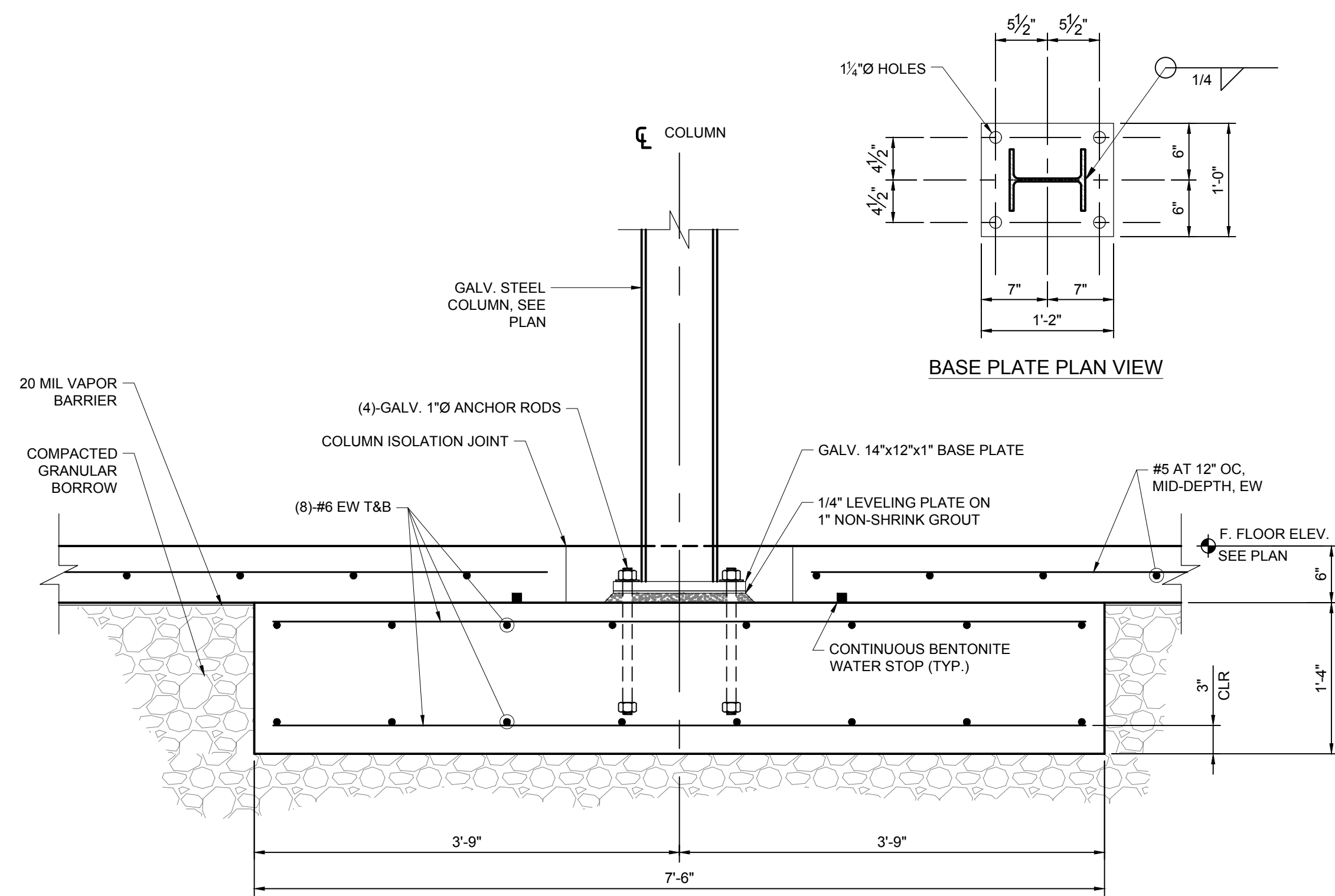
1. TM2.71.54 SUBSTATION ELECTRICAL CLEARANCES (11-2012).

548-2-1	GENERAL ARRANGEMENT PLAN 34.5 S.G./12KV S.G. S/S
548-2-2 SH 2	GENERAL ARRANGEMENT SECTION D-D, E-E, F-F & G-G
548-5-3	CONTROL HOUSE PLAN 34.5 KV & 12KV SWITCHGEAR
548-12-2	YARD ERECTION MATERIAL LIST (ABOVE GROUND)

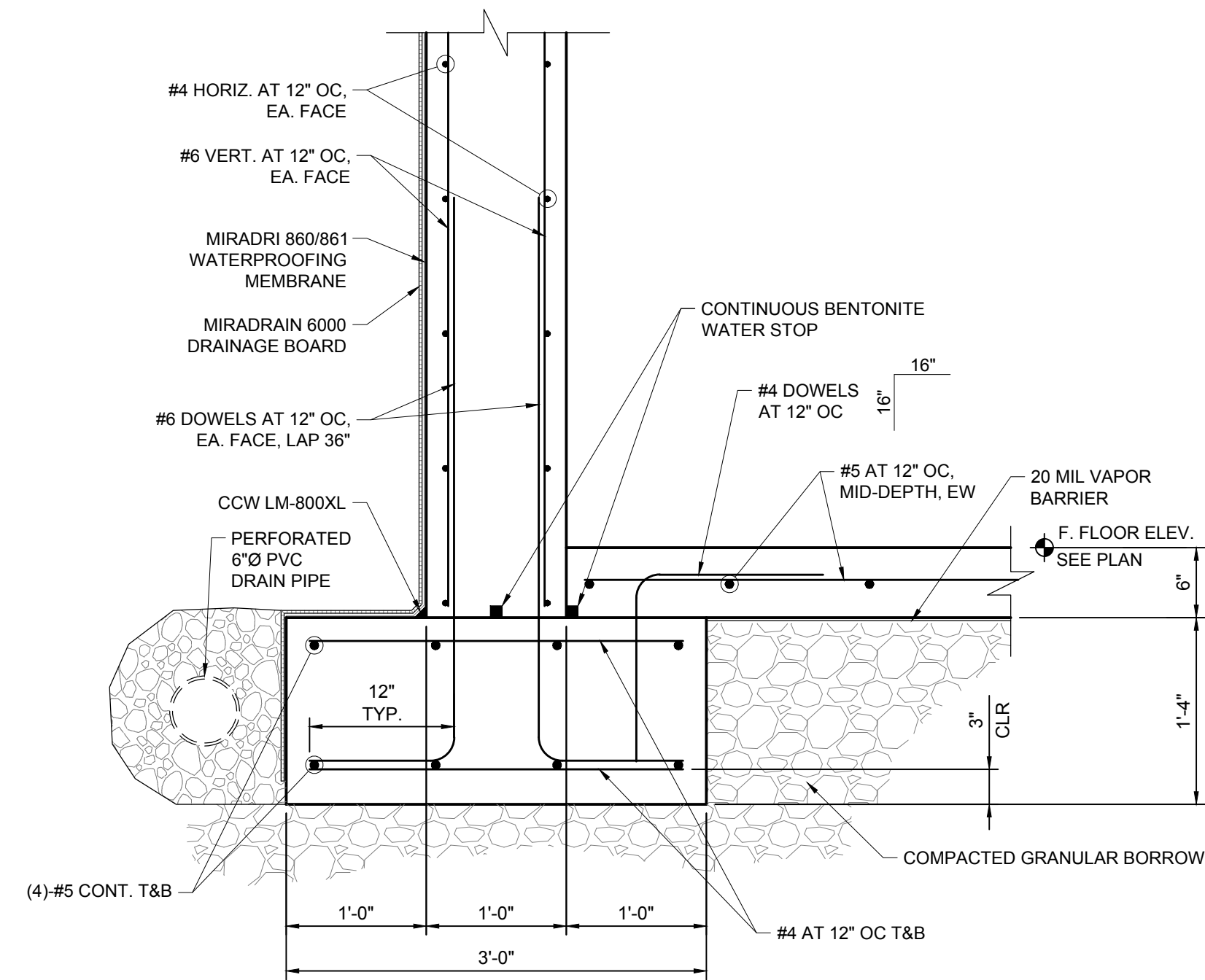


PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							GENERAL ARRANGEMENT SECTION A-A, B-B, & C-C SH 1 OF 2			
							FOREST AVE S/S		PORTLAND, ME		
							BY ASG/BMC CK SBB/MC APP WGR/BMC DATE 07/18/2018	SCALE: 1/4" = 1'-0" NO.	FILE: 548-0002-002 SH 001.dwg	REV	
REV	DESCRIPTION	DATE	BY	CK	APP			548-0002-002 SH 001		0-0C	

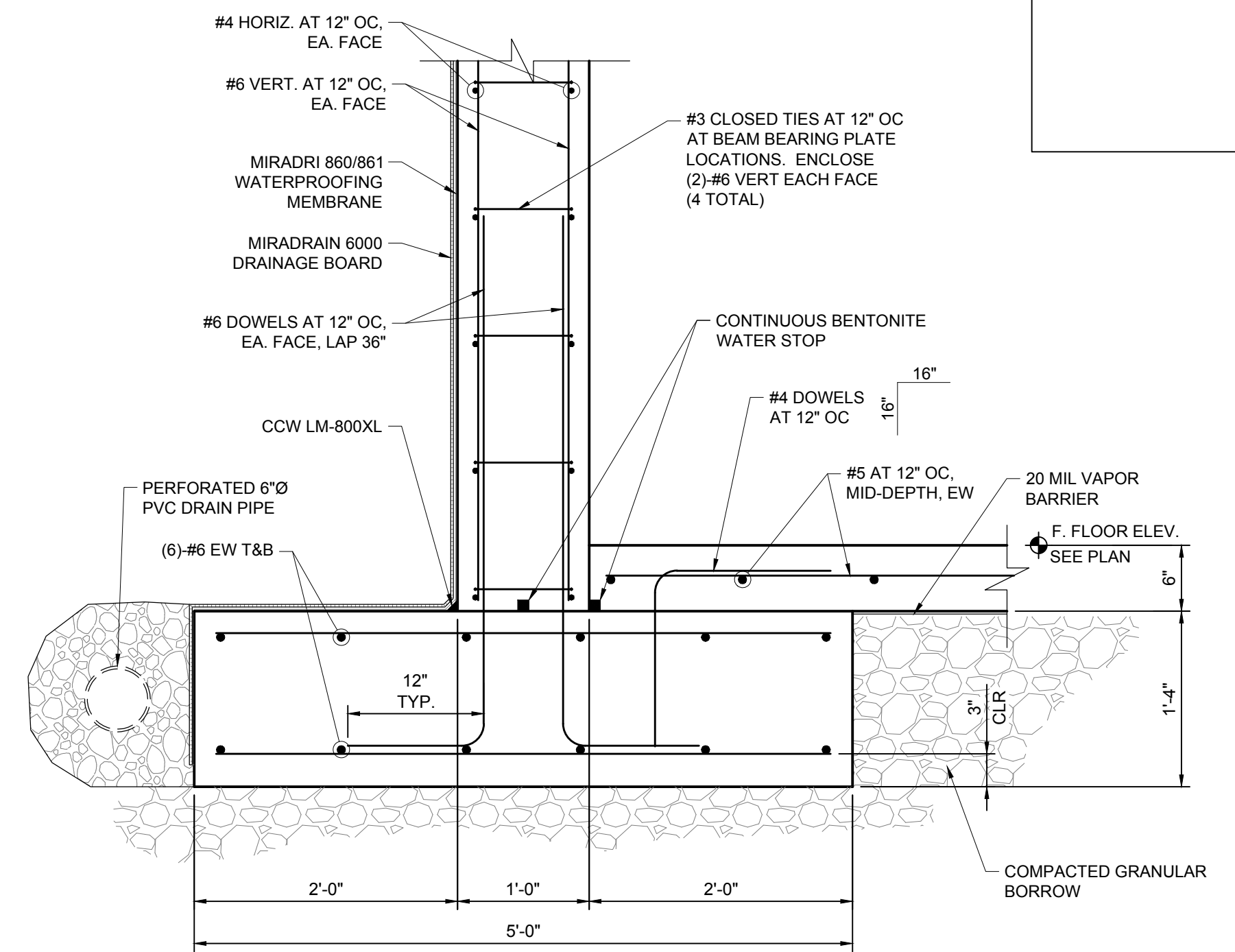
 BURNS & MCDONNELL	INFO
BURNS & MCDONNELL 27 PEARSON DRIVE PORTLAND, ME 04101 207-517-8460	



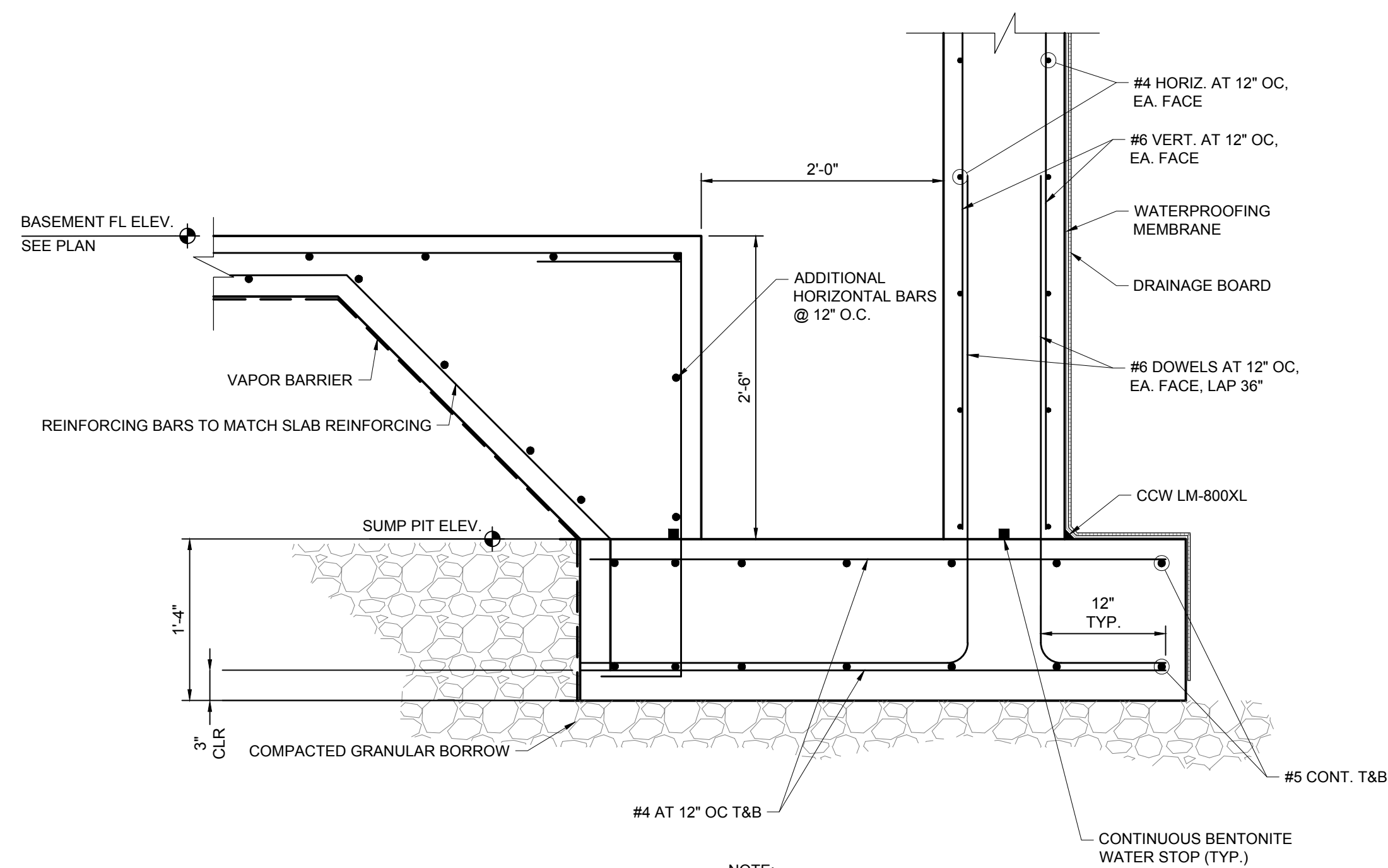
1 COLUMN FOOTING DETAIL
SCALE: 1"=1'-0"



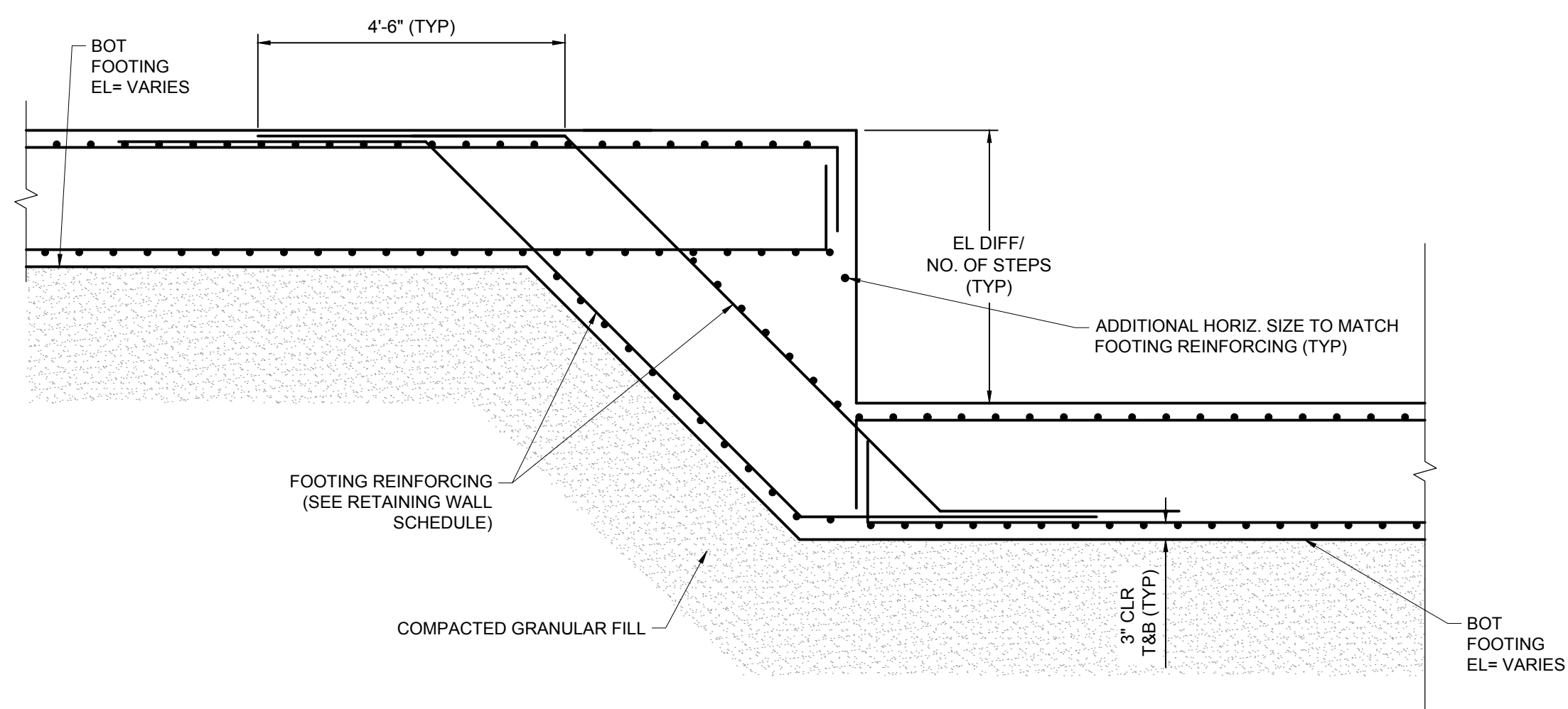
2 TYPICAL WALL DETAIL
SCALE: 1"=1'-0"



3 TYPICAL WALL FOOTING DETAIL
SCALE: 1"=1'-0"



4 TYPICAL SUMP PIT DETAIL
SCALE: 1"=1'-0"



5 TYPICAL WALL FOOTING STEP DETAIL
SCALE: NTS

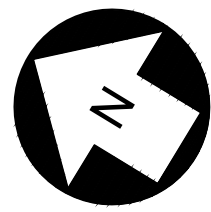
REFERENCE DRAWINGS:

548-4-5

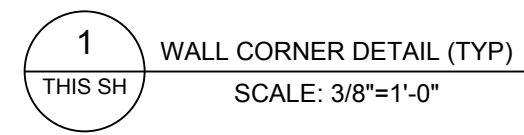
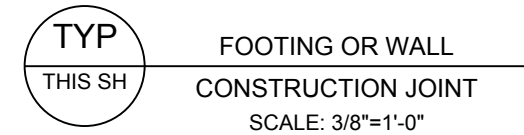
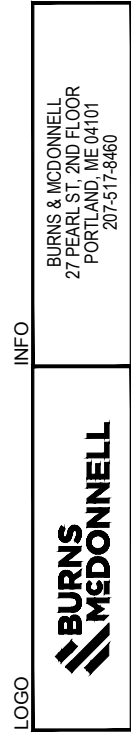
CONTROL HOUSE FOUNDATION 34.5 S.G./12KV S.G. S/S

PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID						CONTROL HOUSE FOUNDATION 34.5 S.G./12KV S.G. S/S			
							FOREST AVE S/S PORTLAND, ME			
							BY WCD/BMC	SCALE: AS NOTED	FILE: 548-0004-008.dwg	REV
							CK MRJ/BMC	NO.		
							APP XXX/BMC			
							DATE: XXXXXXXX		548-0004-008	0-08
	REV	DESCRIPTION	DATE	BY	CK		APP			

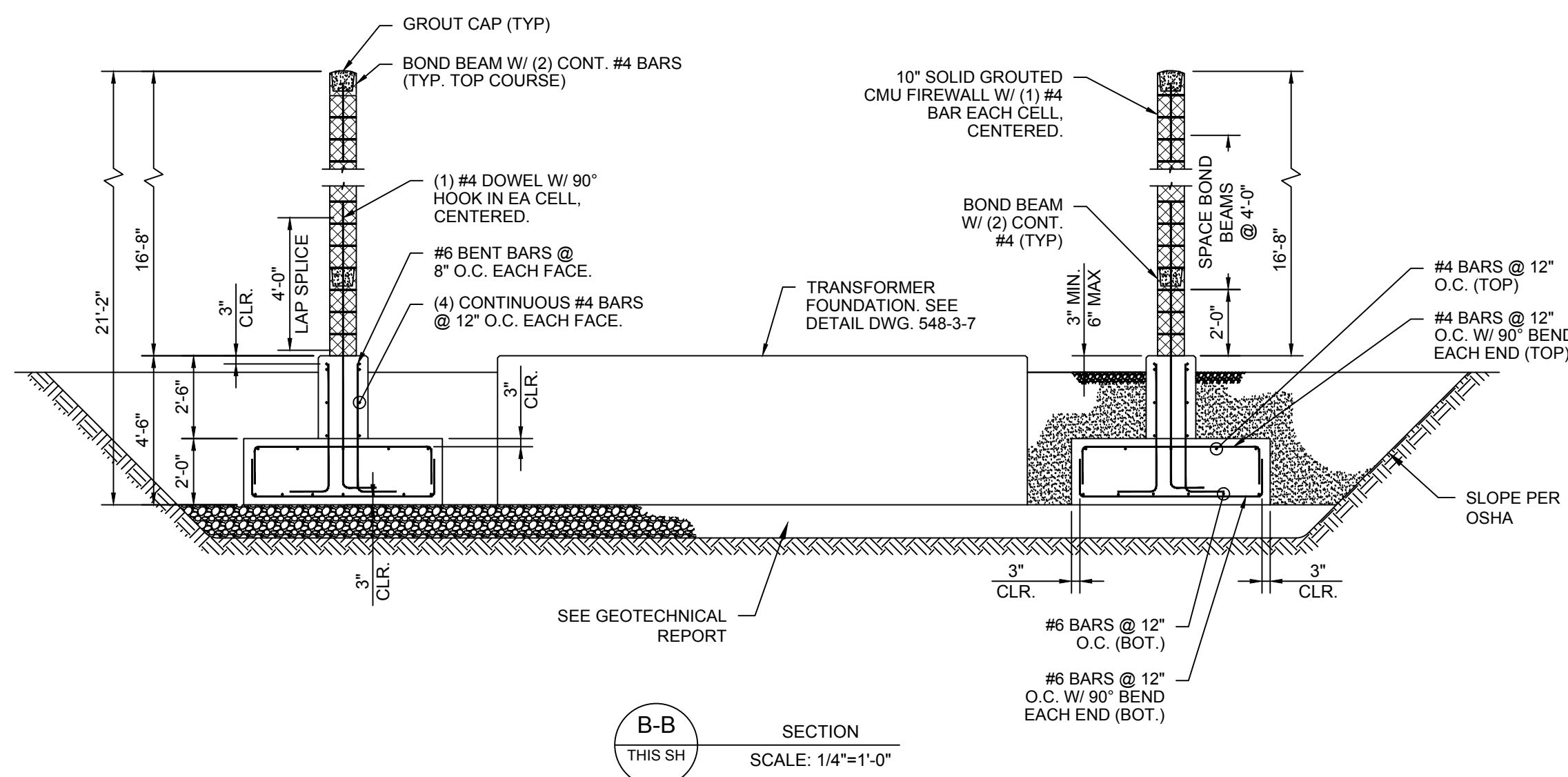
PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID		GENERAL ARRANGEMENT SECTION D-D, E-E, F-F & G-G SH 2 OF 2
	FOREST AVE S/S		
	PORTLAND, ME		
BY: <u>ASG/BMC</u> SCALE: <u>AS NOTED</u> FILE: <u>548-0002-002 SH 002.dwg</u>		NO. <u> </u>	
CK: <u> </u>		REV: <u> </u>	
APP: <u>WGB/BMC</u>		548-0002-002 SH 002	
DATE: <u>07/18/2018</u>		0-0C	



O-0B	ISSUED FOR PERMITTING	12/16/2019		WD	MRD	MRD			
O-0A	ISSUED FOR 60% REVIEW	11/26/19		WCD	MRD	MRD			
REV	DESCRIPTION	DATE	BY	CK	APP	APP			

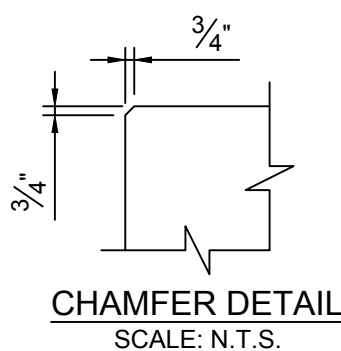


548-3-4 GRADING & DRAINAGE PLAN 34.5 S.G./12KV S.G. S/S
548-3-6 FOUNDATION PLAN 34.5 S.G./12KV S.G. S/S
548-3-7 TRANSFORMER FOUNDATION DETAILS 34.5 S.G./12KV S.G. S/S
548-6-4 CONDUIT PLAN 34.5 S.G./12KV S.G. S/S



FOR PERMITTING
PURPOSES ONLY
NOT FOR CONSTRUCTION

PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							TRANSFORMER FIREWALL FOUNDATION DETAILS					
							FOREST AVE S/S PORTLAND, ME						
							BY	WC/D/BMC	SCALE:	AS NOTED	FILE:	548-0003-008.dwg	REV
							CHK	MRD/BMC	NO.				
							APP	XXX/BMC					
REV	DESCRIPTION	DATE	BY	CK	APP		DATE	XXXXXXXXXX					
											548-0003-008		0-0B



STRUCTURE
CLASSIFICATION (ASCE 7)
SITE LOCATION
ALLOWABLE SOIL BEARING
GROUND WATER ELEVATION
FROST PENETRATION

CATEGORY IV
PORTLAND, MAINE
3000 PSF*
9 FT BFG*
4 FT*

WIND LOADS

BASIC WIND SPEED
IMPORTANCE FACTOR
EXPOSURE CATEGORY

100 MPH
1.15
C

ATMOSPHERIC ICE LOADS

RADIAL ICE
CONCURRENT WIND SPEED

1 INCH
40 MPH

EARTHQUAKE LOADS

IMPORTANCE FACTOR
SITE CLASS
SEISMIC DESIGN CATEGORY
0.2 SEC SPECTRAL ACCELERATION
1.0 SEC SPECTRAL ACCELERATION

1.5
E*
D
0.35**
0.10**

VENDOR REFERENCE

CG POWER SYSTEMS USA INC. DWG547M022-199R-SHEET_1

TRANSFORMER FOUNDATION

34/12KV
20/26/33/37MVA

* DESIGN VALUES BASED ON GEOTECHNICAL
REPORT BY TERRACON DATED JUNE 19, 2018

** DESIGN VALUES BASED ON IUSA TM2.61.00 -
SUBSTATION FOUNDATION STANDARDS REVISION 02.

QUANTITIES

CONCRETE: 21 C.Y.

REFERENCE DRAWINGS:

548-2-1 GENERAL ARRANGEMENT 34.5 S.G./12KV S.G. S/S
548-3-2 SH 1-4 SITE DETAILS 34.5 S.G./12KV S.G. S/S
548-3-4 GRADING PLAN 34.5 S.G./12KV S.G. S/S
548-3-6 FOUNDATION PLAN 34.5 S.G./12KV S.G. S/S
548-6-4 SH 1 & 2 CONDUIT PLAN 34.5 S.G./12KV S.G. S/S

1. CONCRETE SHALL BE 4500psi @ 28 DAYS.
2. REINFORCING SHALL BE ASTM A615 GR. 60 (60ksi YIELD).
3. PROVIDE 3/4" CHAMFER ON ALL EXPOSED EDGES, UNLESS NOTED OTHERWISE.
4. FOUNDATION SHALL BE PLACED ON GRANULAR BURROW.
5. FOUNDATION DESIGNED FOR AN ALLOWABLE SOIL BEARING PRESSURE OF 3000 PSF FROM THE GEOTECHNICAL ENGINEER'S REPORT BY TERRACON, DATED JUNE 19, 2018. FOUNDATION SUBGRADE PREPARATIONS SHALL BE AS FOLLOWS:
 - A. COMPACT FOOTING SUBGRADE PRIOR TO PLACING FOUNDATIONS.
 - B. IF ENCOUNTERED, REMOVE ALL UNSUITABLE SOILS AND REPLACE WITH COMPACTED GRANULAR BORROW IN 8" LIFTS THAT EXTENDS 2/3 D FROM FACE OF FOUNDATION, WHERE D IS THE DEPTH FROM BOTTOM OF FOOTING TO SUITABLE BEARING MATERIAL.
 - C. GRANULAR BORROW SHALL CONFORM TO THE REQUIREMENTS OF MAINE DEPARTMENT OF TRANSPORTATION ITEM 703.19. GRANULAR BORROW SHALL BE COMPACTED TO AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY.

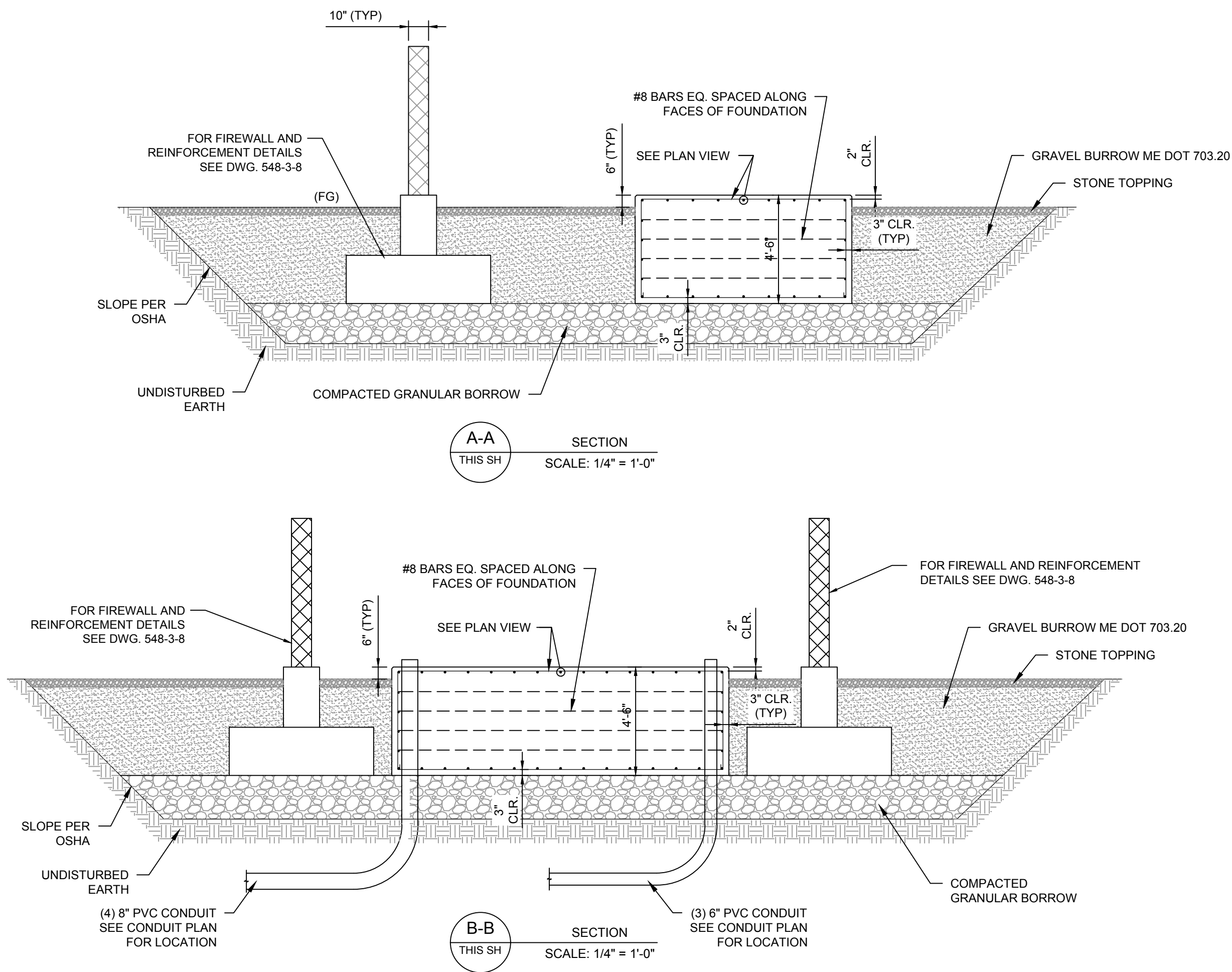
LEGEND OF ABBREVIATIONS:

A.R.	-	ANCHOR ROD
B.C.	-	BOLT CIRCLE
BFG	-	BELOW FINISH GRADE
C.O.G.	-	CENTER OF GRAVITY
CLR	-	CLEAR
CJ	-	CONTROL JOINT
DIA.	-	DIAMETER
DWG	-	DRAWING
EQ	-	EQUAL
FDN.	-	FOUNDATION
FG	-	FINISHED GRADE
HP	-	HIGH POINT
O.C.	-	ON CENTER
S.P.	-	SPACING/SPACED
PROJ.	-	PROJECTION
T.O.C.	-	TOP OF CONCRETE
TYP	-	TYPICAL
UNO	-	UNLESS NOTED OTHERWISE
NAAMM	-	NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

[illegible]

	LOGO	INFO	BURNS & McDONNELL 27 PEARL ST. 2ND FLOOR PORTLAND, ME 04101 207-517-8460
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ANSI D 12/17/2019



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PE STAMP

AVANGRID ENGINEERING
CONFIDENTIAL, PROPRIETARY and
TRADE SECRET INFORMATION
Property of AVANGRID



TRANSFORMER
FOUNDATION DETAILS
34.5 S.G./12KV S.G. S/S

FOREST AVE S/S

PORTLAND, ME

BY WCD/BMC
CK MWD/BMC
DSP XXX/BMC
DATE XXXXX/XXXXX

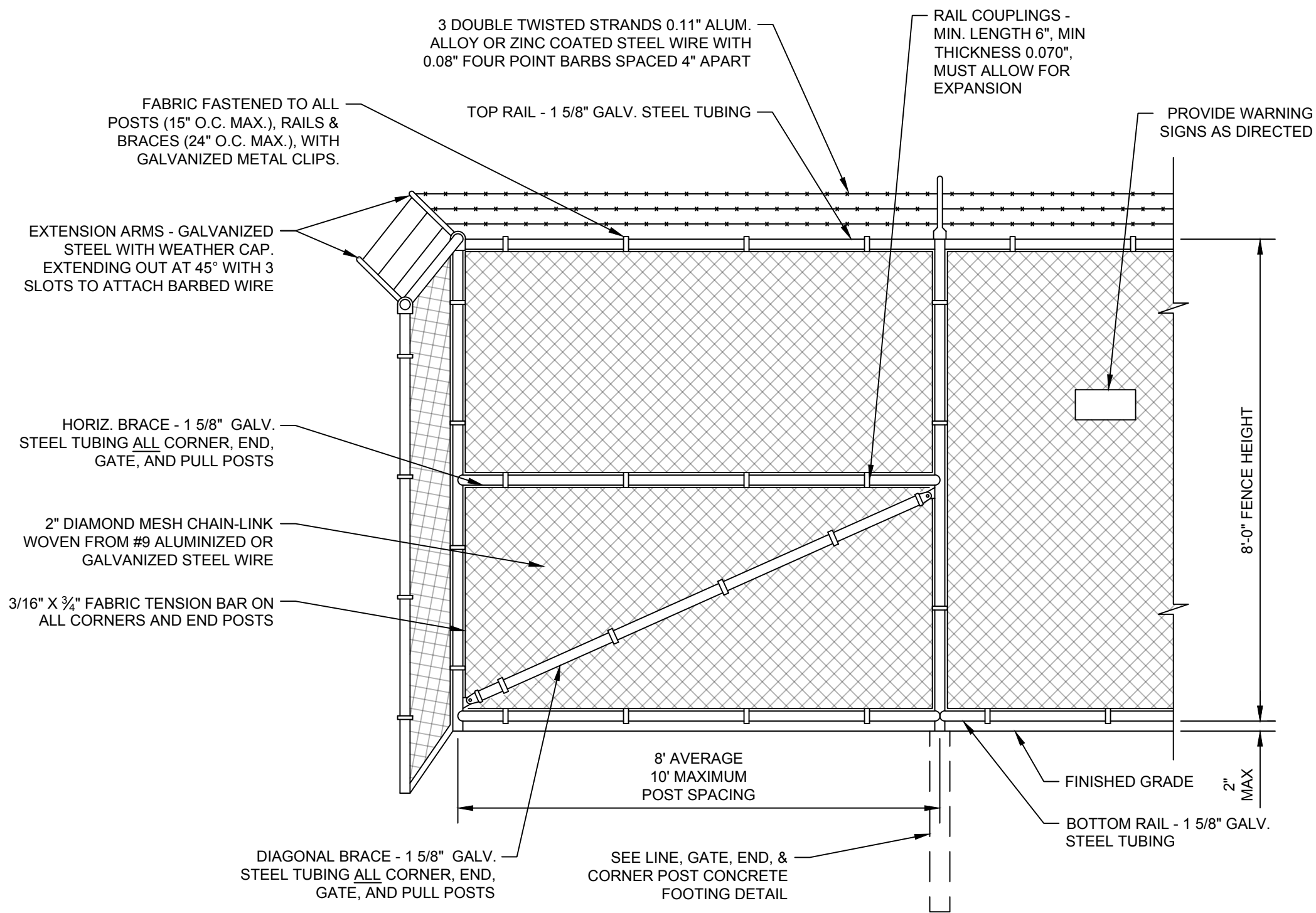
SCALE: AS NOTED
NO.

FILE: 548-0003-007.dwg

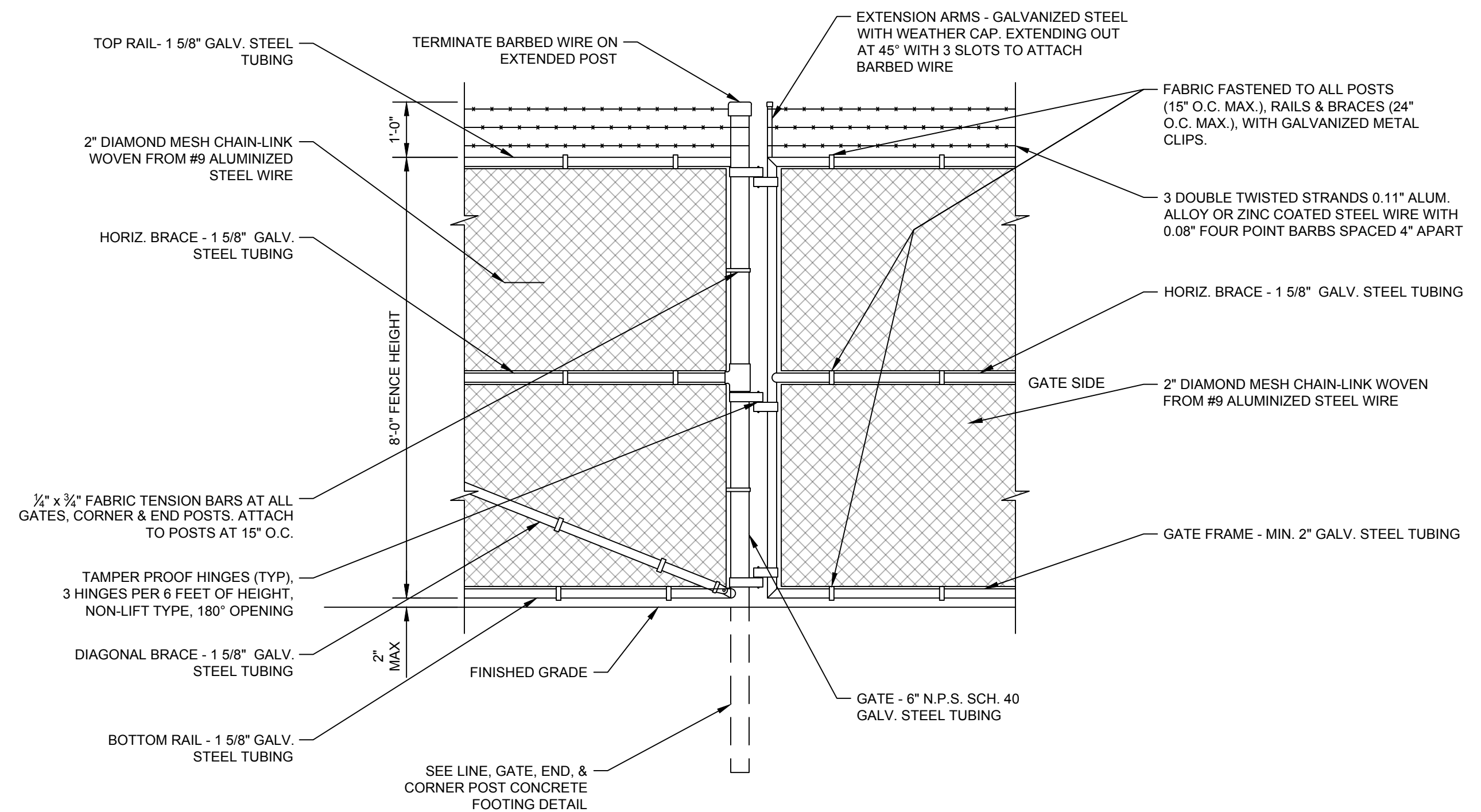
548-0003-007

REV 0-0B

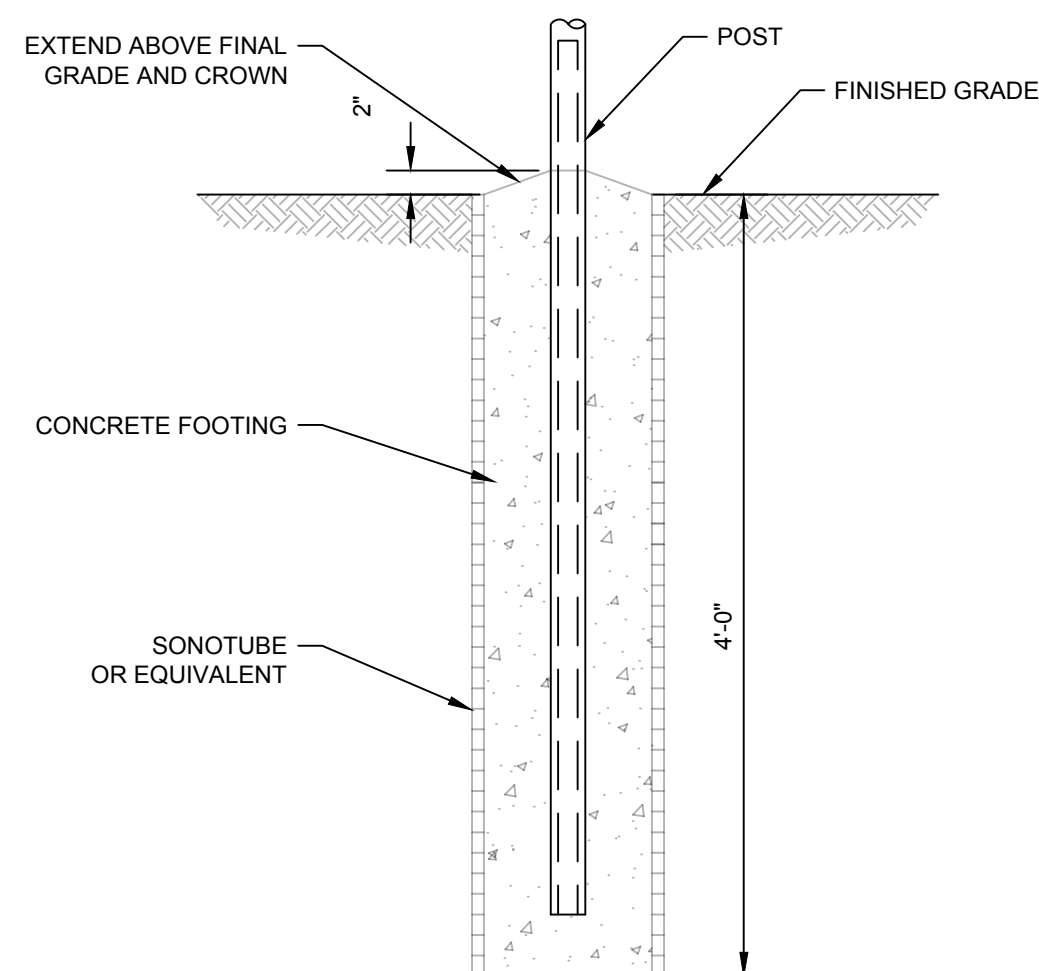
REV	DESCRIPTION	DATE	BY	CK	APP



MATERIAL AND STRUCTURAL DETAILS
NOT TO SCALE



GATE FRAME DETAIL
NOT TO SCALE



POST USE	LINE	GATE	CORNER	END
ASTM F 1043 (INCHES)	3	6	4	4
SONOTUBE SIZE (INCHES)	12	24	12	12

- FOOTING NOTES:**
1. UNLESS OTHERWISE INDICATED, FENCE POST SIZES ARE INDUSTRY STANDARD NOMINAL SIZES IN ACCORDANCE WITH ASTM F 1043, GALVANIZED STEEL PIPE.
 2. BACKFILL SONOTUBE WITH MIN. 3,000 PSI CONCRETE.
 3. ALL CONCRETE SHALL BE SINGLE POUR TO FINAL GRADE.
 4. WHEN INSTALLING POSTS IN CLAY:
 - POST HOLE DEPTH SHALL BE INCREASED TO 6 FEET.
 - BACKFILL 4 FEET WITH CONCRETE.
 - BACKFILL FINAL 2 FEET WITH NATIVE SOIL.

LINE, GATE, END, & CORNER POST CONCRETE FOOTING DETAIL

NOT TO SCALE

- ### FENCE AND GATE NOTES:
1. ALL ITEMS SHALL BE GALVANIZED AND ZINC COATED TO ASTM SPECIFICATIONS, INCLUDING ALL POSTS, RAILS, GATES, AND HARDWARE.
 2. FENCES AT CRITICAL FACILITIES SHALL INSTALL A DUAL TOP GUARD WITH ARMS EXTENDING INWARD AND OUTWARD.
 3. RAZOR WIRE MAY BE USED IN PLACE OF BARBED WIRE IN HIGH RISK AREAS.
 4. GATE FENCE FABRIC SHALL BE MOUNTED INSIDE THE FRAME.
 5. BOLTS AND HINGES SHALL BE OF A TAMPER-PROOF TYPE.
 6. EXPOSED BOLTS AND NUTS SHALL BE SPOT WELDED.
 7. PROVIDE GROUNDING PER AVANGRID STANDARD
 8. REFER TO AVANGRID STANDARD TM 2.71.13 AND TM 2.71.09 - YARD & FENCING FOR ADDITIONAL INFORMATION.
 9. THIS DRAWING HAS BEEN CREATED FROM AVANGRID STANDARD DRAWING TM 2.71.09B

REFERENCE DRAWINGS:

548-2-1	GENERAL ARRANGEMENT PLAN 34.5 S.G./12KV S.G. S/S
548-3-1	SITE PLAN 34.5 S.G./12KV S.G. S/S
548-3-6	FOUNDATION PLAN 34.5 S.G./12KV S.G. S/S

FOR PERMITTING
PURPOSES ONLY
NOT FOR CONSTRUCTION

PE STAMP	AVANGRID ENGINEERING CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION Property of AVANGRID							FENCE & GROUNDING DETAILS TYPICAL SECURITY FENCE DETAILS 34.5 S.G./12KV S.G. S/S					
								FOREST AVENUE S/S					
								PORTLAND, ME					
								BY WCD/BMC		SCALE: AS NOTED		FILE: 548-0006-011.dwg	
								CK MRD/BMC		NO.			
								APP XXXXXX					
								DATE XXXXXXXX					
	REV	DESCRIPTION	DATE	BY	CK	APP	548-0006-011				0-0B		

PLANNING BOARD REPORT PORTLAND, MAINE



Zoning Text Amendment
385 Congress Street
ZN-001020-2020
Portland Opportunity Fund LLC, Applicant

Submitted to: Portland Planning Board
Public Hearing Date: 5/12/2020

Prepared by: Christian Roadman, Planner
Date Prepared: 5/7/2020



The surrounding context of 385 Congress Street, highlighted in teal

I. Introduction & Proposal Overview

Portland Opportunity Fund LLC seeks a zoning text amendment to facilitate development at 385 Congress Street, which is zoned B-3 downtown business. The proposed text amendment (**Attachment F**) would add congregate care facilities and intermediate care facilities as permitted uses to the B-3 zone (as well as the B-3b and B-3c zones, which share the same list of permitted uses).

The review of this proposed text change does not include site plan considerations. It is intended to determine if the Planning Board finds the addition of these two permitted uses consistent with the comprehensive plan and worthy of recommendation to the City Council. However, the applicant's intended development provides helpful context. They propose (**Attachment C**) to "develop an elderly housing complex that would consist of a congregate care facility (independent living apartments) and an intermediate care facility that will be comprised of assisted living units and a memory care facility." If approval is granted by the Planning Board and City Council for a zoning text change, the applicant may follow with a master development plan and/or level III site plan for their broader development intentions.

II. Zoning Analysis

Both proposed additional permitted uses are defined in the zoning code:

Congregate care facility:

"A residential development which provides individual living or dwelling units with support services which provide assistance to residents. Services to be provided shall include:

- (a) Transportation for essential support activities. This service shall be included in the base rent;*
- (b) Provision of at least one (1) meal per day;*
- (c) Programmed social activities which are facilitated by staff. This service shall be included in the base rent;*
- (d) Provision of personal care services including, but not limited to, housekeeping, laundry, and minimal health monitoring; and*
- (e) Installation of emergency call buttons or systems in each congregate care living unit.*

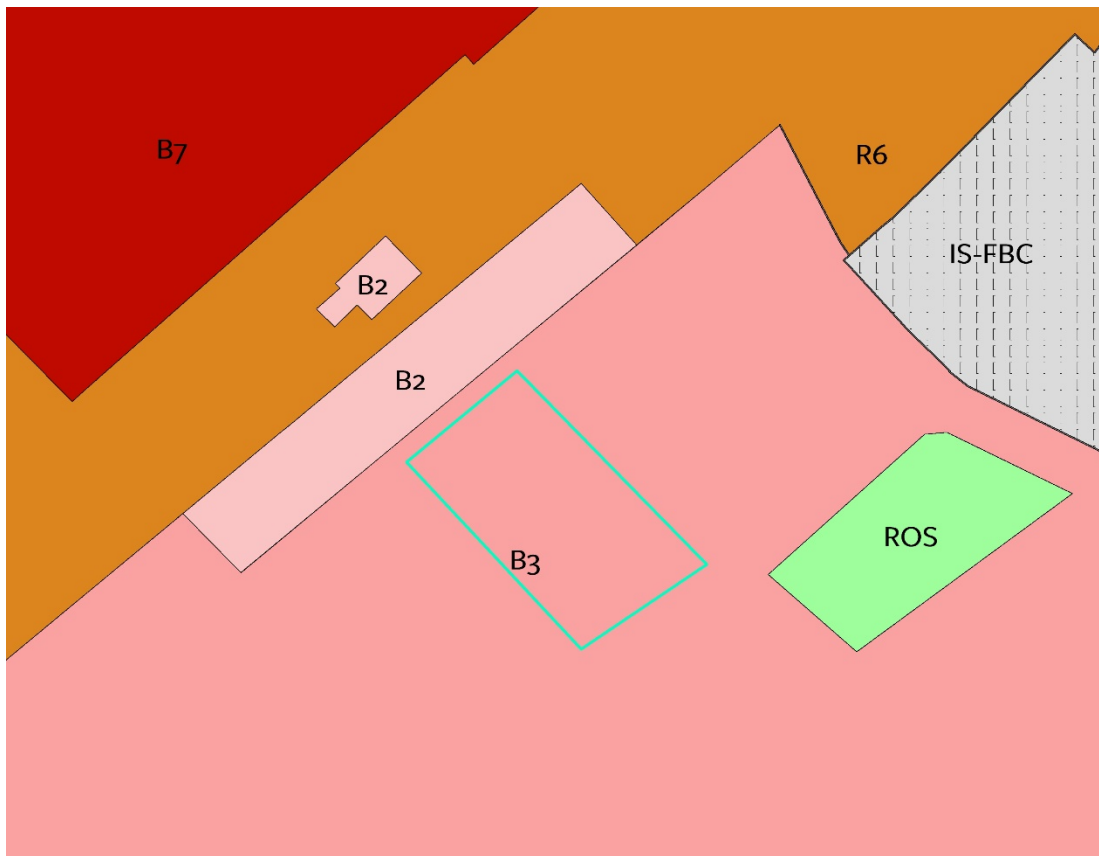
The population of a congregate care facility shall consist of persons fifty-five (55) years of age or older and their spouses and/or disabled persons and their spouses."

Intermediate care facility:

"A facility which provides, on a regular basis, health-related care and services to individuals who do not require the degree of care and treatment which a hospital or extended care facility is designed to provide but who, because of their mental or physical condition, require such care and services above the level of room and board. Said facility must be licensed as a board care, residential care facility or equivalent pursuant to the regulations promulgated by the State of Maine Department of Health and Human Services."

Two points in the zoning code's purpose statement for the B-3 zones are particularly relevant to the proposed change: "encourage increased housing opportunity downtown for a diverse residential population," and "reinforce the role of the downtown as a meeting place for community residents and visitors alike from all walks of life and all socio economic groups."

As noted by the applicant (**Attachment C**), multi-family housing is already permitted in B-3 zones.



Zoning context of 385 Congress Street, highlighted in teal

III. Comprehensive Plan

[Portland's Plan 2030](#) identifies vision statements, policy goals for the City, and principles of future land use. Several of these are relevant to the proposed text amendment.

Vision statements:

Equitable:

"We will remain an open and inclusive city, celebrating diversity and providing a welcoming and safe place for residents and visitors alike."

"We will incorporate the needs of all our residents in planning for our future."

Dynamic:

"Portland will plan for a built environment that encourages an active citizenry."

Secure:

"We will be committed to accessible housing and healthy food for all our residents."

Connected:

"We will foster accessible linkages between where we live, work, shop, and play."

Policy goals:

Environment: *“Adopt sustainable land use and transportation policies that support connectivity, walkable neighborhoods, and multi-modal transportation.”*

Housing:

“Increase, preserve, and modify the overall supply of housing city-wide to meet the needs, preferences, and financial capabilities of all Portland residents.”

“Encourage additional contextually appropriate housing density in and proximate to neighborhood centers, concentrations of services, and transit nodes and corridors as a means of supporting complete neighborhoods.”

Transportation: *“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.”*

The applicant provided additional analysis of consistency with the comprehensive plan (**attachment B**).



Context of the B-3 and B-3c zones. 385 Congress Street is highlighted in teal

IV. Requisite Council Action

Any proposed rezoning, regardless of whether it is recommended by the Planning Board, must be approved by City Council vote in order to take effect.

V. Proposed Motion

On the basis of materials submitted by the applicant, the City of Portland Land Use Code, Portland's Comprehensive Plan, public comment, and the information provided in public hearing on May 12, 2020 for the application ZN-001020-2020, the Planning Board finds that the proposed text amendment to Division 12 Section 14-217 of the City's Land Use Code (adding congregate care facilities and intermediate care facilities as permitted uses) **[is / is not]** consistent with the Comprehensive Plan for the City of Portland.

Therefore, the Planning Board **[recommends / does not recommend]** to the City Council adoption of the zoning text amendment.

Applicant Submittals

- A. Application Checklist
- B. Comprehensive Plan Analysis
- C. Cover Letter
- D. Deed
- E. Right, Title, & Interest Letter
- F. Proposed Text Amendment
- G. Vicinity Map

CITY OF PORTLAND
Planning & Urban Development Department

TEXT AMENDMENT SUBMISSION CHECKLIST	
* Please upload each document <u>and</u> drawing as a separate PDF file * 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
☒	Proposed Text Amendment Provide proposed language for text amendment(s) and cite the relevant sections to be revised in the Land Use code.
☒	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 – Text Amendment Application (this document)
☒	Right, Title and Interest Deeds, leases, or purchase and sales agreements

COMPREHENSIVE PLAN ANALYSIS

PROPOSED AMENDMENTS TO B-3 DOWNTOWN BUSINESS ZONE

Maine is the oldest state in the country and while Portland's median age is lower than the Maine average, according to Portland's Plan 2030, Baby Boomers are the fastest growing age group in Portland. Although that age group is growing fast, there are limited opportunities for elderly housing facilities on the peninsula. Permitting such facilities to locate downtown in the B-3 zone is consistent with the City's Comprehensive Plan and directly facilitates many of the goals set forth in the Plan.

This proposal contemplates adding Congregate Care Facilities and Intermediate Care Facilities as permitted uses in the B-3 zone. The Land Use Code includes the following definitions:

- Congregate Care Facility: A residential development which provides individual living or dwelling units with support services which provide assistance to residents. Services to be provided shall include: (a) Transportation for essential support activities. This service shall be included in the base rent; (b) Provision of at least one (1) meal per day; (c) Programmed social activities which are facilitated by staff. This service shall be included in the base rent; (d) Provision of personal care services including, but not limited to, housekeeping, laundry, and minimal health monitoring; and (e) Installation of emergency call buttons or systems in each congregate care living unit. The population of a congregate care facility shall consist of persons fifty-five (55) years of age or older and their spouses and/or disabled persons and their spouses."
- Intermediate Care Facility: A facility which provides, on a regular basis, health-related care and services to individuals who do not require the degree of care and treatment which a hospital or extended care facility is designed to provide but who, because of their mental or physical condition, require such care and services above the level of room and board. Said facility must be licensed as a board care, residential care facility or equivalent pursuant to the regulations promulgated by the State of Maine Department of Health and Human Services.

Congregate care facilities are currently not permitted on the peninsula and neither congregate care nor intermediate care facilities are permitted in the B-3 zone. Intermediate care facilities are permitted in the B-2 and IM zones; they are also permitted in the R-6, but require one acre of land. The opportunity to locate such facilities on the peninsula are therefore limited. However, the City's Plan 2030 is wholly consistent with the location of elderly housing downtown.

Relevant, Consistent City Goals and Strategies

Economy

- Create economic prosperity by growing Portland's tax and employment base.
- Support sustainable growth in our educational, medical, and cultural institutions.
- Respect that our unique quality of place is key to our current and future economic success.

Locating congregate care and intermediate care facilities downtown helps to grow Portland's tax base, as well as its employment base. Portland's downtown is an attractive work environment for the employees who would staff the facilities; the downtown location would therefore make it easier for such facilities to attract new employees to the City. Locating congregate care and intermediate care facilities in the downtown supports sustainable growth of medical institutions by encouraging the location of such facilities closer to existing medical service centers; while taking some of the burden off of existing medical facilities in the specialty areas served by the facility, such as memory care. Educational and cultural institutions will also benefit from increased population of seniors in the downtown area as visitors, volunteers, and financial supporters. Finally, Portland's unique quality of place is the reason why the growing age bracket of baby boomers want to remain here or move here for their retirement. Locating senior housing on the peninsula will add vitality and opportunities for intergenerational experiences for residents and workers of all ages. Seniors desire to live in places that are walkable, active, and engaging which is the essence of the downtown experience. The ability to live in a convenient downtown location is an important feature and directly related to the quality of all that is Portland.

Housing

- Increase, preserve, and modify the overall supply of housing city-wide to meet the needs, preferences and financial capabilities of all Portland residents.
- Encourage additional contextually appropriate housing density in and proximate to neighborhood centers, concentrations of services, and transit nodes and corridors as a means of supporting complete neighborhoods.
- Pursue policies to enable people who work in Portland to have the option to live in Portland.
- Remove housing barriers
- Support age-friendly housing options
- Support programs and tools that facilitate aging safely in place.
- Create, promote, and facilitate safe, affordable and practical housing solutions that will meet the evolving needs of Portland residents as they age.

The proposal to locate congregate and intermediate care facilities downtown would help the City achieve all of the above-listed goals and strategies. Downtown age-friendly housing would increase the housing supply; encourage contextually appropriate housing density; enable people who work in Portland to live in Portland; remove the current barrier that prohibits congregate care or intermediate care facilities downtown; increase age-friendly housing options; increase options for aging in place; and creates housing solutions that meet the evolving needs of Portland residents as they age. Elderly residents also rely heavily on a variety of services such as medical, social, educational, supportive, and entertainment services that are readily available in the B-3 zone. As congregate care facilities and intermediate care facilities are not allowed in the B-3 zone, seniors that desire or require supportive housing lack adequate housing choices that meet the unique needs of an aging population. By definition, congregate care facilities and intermediate care facilities are "age-friendly housing" and allowing them in the B-3 zone will provide seniors with increased options for housing in the downtown area. Additionally, it will allow more seniors to age in place by providing the supportive environment

and the central location that is in close proximity to public and private services, businesses and institutions that are needed by an aging population.

Transportation

- 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 age-friendly initiatives
- Consider specific measures to promote awareness and usability of our transportation system for the elderly.
- Consider senior transportation needs in areas of concentrated senior housing, including, but not limited to, new developments.

The Plan contains several goals around public transportation for seniors. Bringing seniors into the downtown relieves the pressures on the systems needed to bring them downtown and allows those resources to concentrate on moving people around the downtown. Many employees, elderly residents, and their families rely heavily on public transportation, which is readily available in the B-3 zone. This supports the seniors by enabling them to live more actively and independently and also helps the public transportation system by adding additional riders to the system. Congregate and intermediate care facilities also do not place the same burden on existing automobile traffic as compared to other developments that are currently permitted in the downtown.

Future Land Use

- Reinforce the Center: Though Portland's commercial and entrepreneurial activity takes place throughout the city, downtown Portland remains at the center of the region's arts and cultural, economic, and civic health, and Portland's Plan embraces the principle that downtown should continue to be a predominant locus of activity for the broader region.

The B-3 downtown business zone is the locus of activity for the region. As such, seniors should be given the opportunity to live in the City's center of arts and cultural, economic and civic health. As the population ages the downtown area will need to address the unique needs of this segment of the population in order to remain healthy, vibrant and relevant. Increasing housing options for seniors in the downtown area will support the arts, cultural, economic, and civic vitality of the area.

Based on the above analysis, the proposed amendment to add Congregate Care Facilities and Intermediate Care Facilities as permitted uses in the B-3 zone is pursuant to and consistent with Portland's Plan 2030.



**Bernstein, Shur,
Sawyer & Nelson, P.A.**
100 Middle Street
PO Box 9729
Portland, ME 04104-5029

T (207) 774 - 1200
F (207) 774 - 1127

Mary E. Costigan
(207) 228-7147 direct
mcostigan@bernsteinshur.com

February 19, 2020

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

RE: Application for B-3 Text Amendment

Dear James:

I am writing on behalf of my client, Portland Opportunity Fund LLC, to apply for a text amendment to the B-3 Downtown Business Zone. As explained in more detail below, we are seeking to amend the B-3 zone by adding Congregate Care Facilities and Intermediate Care Facilities as permitted uses in the B-3.

Portland Opportunity Fund is under contract to purchase a portion of a parcel located at 385 Congress Street. They are proposing to develop an elderly housing complex that would consist of a Congregate care facility (independent living apartments), and an Intermediate care facility that will be comprised of assisted living units and a memory care facility. As currently zoned, the B-3 permits multi-family housing but does not allow congregate care or intermediate care facilities.

Portland Opportunity Fund is a joint venture between Senior Care Development LLC and Benchmark Senior Living. Benchmark is the largest operator of senior housing in New England and has identified the Portland downtown as an ideal location for senior housing. As set forth in more detail in the attached Comprehensive Plan Analysis, the location of senior housing in the B-3 aligns directly with many of the Plan's goals; notably, the economic, housing and transportation goals. Locating senior housing convenient to educational and cultural institutions, medical service centers, social opportunities and public transportation is a benefit to the City, the residents and the local businesses and service-providers.

February 19, 2020
Page 2

Enclosed with this letter are the above-referenced Comprehensive Plan Analysis, evidence of Right, Title and Interest and the Proposed Text Amendment. Thank you for your consideration. Please contact me directly if you have any questions.

Sincerely,



Mary E. Costigan

cc: Eric Gardner

QUITCLAIM DEED WITH COVENANT
(Maine Statutory Short Form)

METRO MEDIA PROPERTIES LLC, a Maine limited liability company with a mailing address of 201 Old Country Road, Suite 105, Melville, NY 11747 ("Grantor"), for consideration paid, grants to **385 CONGRESS LLC**, a Maine limited liability company with mailing address of 2730 Transit Road, West Seneca, NY 14224 ("Grantee"), with QUITCLAIM COVENANT, a certain lot or parcel of land with the buildings and improvements thereon located in the City of Portland, County of Cumberland and State of Maine, described as follows:

A certain lot or parcel of land in Portland, County of Cumberland and State of Maine bounded and described generally as follows:

South: Congress Street;
East: Pearl Street;
North: Cumberland Avenue; and
West: Myrtle Street

This parcel of land is more particularly described as follows:

Beginning at the intersection of the Northerly sideline of Congress Street with the Easterly sideline of Myrtle Street;

Thence: N72° 54' E along the Northerly sideline of Congress Street approximately Two Hundred Forty Feet (240') to the intersection of the Northerly sideline of Congress Street with a Westerly sideline of Pearl Street;

Thence: N27° 21' W along the Westerly sideline of Pearl Street approximately Four Hundred Fifty Five Feet (455') to the intersection of the Westerly sideline of Pearl Street with a Southerly sideline of Cumberland Avenue;

Thence: Westerly along the Southerly sideline of Cumberland Avenue approximately One Hundred Seventy Feet (170') to a point;

Thence: Northerly to point A (point A being located at the intersection of the line of this call with the line of the next call extended N 67° 11' E);

Thence S67° 11' W approximately Sixty Feet (60') to the intersection of the Southerly sideline of Cumberland Avenue with the Easterly sideline of Myrtle Street;

Thence S26° 22' E along the Easterly sideline of Myrtle Street approximately Four Hundred Ten Feet (410') to the intersection of the Easterly sideline of Myrtle Street with the Northerly sideline of Congress Street and the point of beginning.

Also conveying the following parcel of land:

A certain lot or parcel of land with the buildings thereon situated in the City of Portland, County of Cumberland and State of Maine, bounded and described generally as follows:

Beginning at a drill hole reset marking the intersection of the northwesterly sideline of Congress Street and the northeasterly sideline of Myrtle Street;

Thence N 55°-45'-03" E, 240.31 feet by and along the northwesterly sideline of said Congress Street to a drill hole set marking the northwesterly sideline of said Congress Street and the southwesterly sideline of Pearl Street;

Thence N 44°-35'-56" W, 433.81 feet by and along the southwesterly sideline of said Pearl Street to a point at the intersection of the southwesterly sideline of Pearl Street with the southeasterly sideline of Cumberland Avenue. Said point being witnessed by a granite right-of-way monument.

Thence S 50°-25'-20" W, 230.34 feet by and along the southeasterly sideline of said Cumberland Avenue to a point at the intersection of said southeasterly sideline of Cumberland Avenue with said northwesterly sideline of Myrtle Street. Said point being witnessed by a granite right-of-way monument.

Thence S 43°-37'-52" E, 410.86 feet by and along the northeasterly sideline of said Myrtle Street to the Point of Beginning, containing 2.26 acres more or less.

Also releasing to Grantee, Grantor's right, title and interest in a certain underground tunnel that runs from the subject premises to 390 Congress Street, by virtue of a license granted pursuant to approval of the City of Portland Inspector of Buildings dated May 14, 1965.

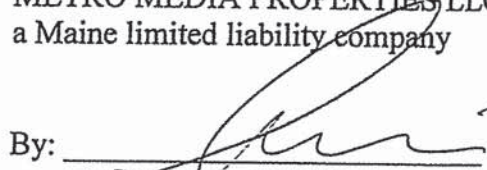
Being the same premises described in a Quitclaim Deed with Covenant from MTM Portland Properties, LLC to Metro Media Properties, LLC dated July 10, 2009 and recorded in the Cumberland County Registry of Deeds at Book 27079, Page 160.

IN WITNESS WHEREOF, Metro Media Properties LLC has caused this instrument to be signed and sealed in its company name by George Cacoulidis, its CEO, thereunto duly authorized, this 20th day of October, 2017.

WITNESS:

METRO MEDIA PROPERTIES LLC,
a Maine limited liability company


Tom Hanson

By: 

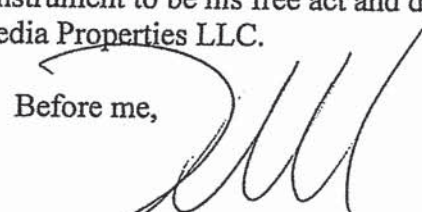
George Cacoulidis
Title: CEO

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

October 20, 2017

Then personally appeared the above named George Cacoulidis, CEO of Metro Media Properties LLC, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of Metro Media Properties LLC.

Before me,


~~Attorney at Law/Notary Public~~

Printed Name: Nicholas J. Merrill

February 19, 2020

Eric Gardner
Benchmark Senior Living
201 Jones Road, Suite 300
West Waltham, MA 02451

Dear Eric,

The purpose of this letter is to authorize Portland Opportunity Fund LLC to submit the text amendment for the property located at 385 Congress Street in Portland ME. The aforementioned property is currently subject to a purchase and sale agreement between 385 Congress LLC (the seller) and Senior Care Development LLC (the buyer) dated December 12, 2019. As requested, I have included a copy of the Deed as proof of ownership.

If there is anything else you need please do not hesitate to contact me.

Sincerely,



Joseph Dasco
Authorized Agent
385 Congress LLC

Proposed Text Amendment to B-3 Downtown Business Zone

Sec. 14-217. Permitted uses.

(a) The following uses are permitted in the B-3, B-3b and B-3c zones:

1. Residential:

- a. Attached single-family, two-family and multifamily dwellings;
- b. Handicapped family units;
- c. Lodging houses;
- d. Combined living/working spaces including, but not limited to, artist residences with studio space;
- e. Congregate care facilities.

2. Business:

- a. General and business offices;
- b. Professional offices;
- c. Personal services;
- d. Offices of building tradesmen;
- e. Retail establishments, excluding gasoline sales, wholesale and bulk purchase lumber and construction supply sales;
- f. Restaurants, excluding drive-through or drive-in restaurants;
- g. Drinking establishments, except that drinking establishments and chemical-free night clubs, as defined in section 14-47, shall not be permitted in any location in the B-3c zone, including but not limited to the PAD overlay area;
- h. Billiard parlors;
- i. Miscellaneous repair services, excluding motor vehicle repair services;
- j. Communication studios or broadcast and receiving facilities;
- k. Health clubs and gymnasiums;
- l. Theaters and performance and exhibition halls;
- m. Convention and meeting facilities;
- n. Hotels;
- o. Business services;
- p. Parking garages;
- q. Galleries;
- r. Registered dispensary;
- s. Marijuana retail store;
- t. Small-scale marijuana caregiver.

3. Institutions:

- a. Museums;
- b. Public or private schools of any type;
- c. Clinics;
- d. Places of assembly;
- e. College, university, trade school;

- f. Nursery schools, kindergartens, and day care facilities or home babysitting services.
- g. Governmental offices. As used in this section, governmental office means a place of business of a federal, state, count or municipal governmental entity when professional or clerical duties are performed, including but not limited to back office uses as defined in Section 14-47 and judicial functions;

h. Intermediate care facility for thirteen (13) or more persons.

4. Other:

- a. County and municipal uses;
- b. Studios for artists and craftspeople including, but not limited to, carpenters, cabinetmakers and silk screeners;
- c. Printing, publishing and related manufacture of cardboard or paper boxes, provided that these activities are conducted wholly within a building.
- d. Bed and breakfast, subject to the standards of article V (site plan), sections 14-522 and 14-523 notwithstanding. A bed and breakfast may include a meeting facility if the facility meets the following standards:

- i. The meeting facility shall be limited to the following types of uses:

- (a) Private parties.
 - (b) Business meetings.
 - (c) Weddings.
 - (d) Receptions.
 - (e) Seminars.
 - (f) Business and educational conferences.

- ii. The building in which the bed and breakfast and the meeting facility will be located was in existence on March 3, 1997, and was greater than four thousand (4,000) square feet in floor area on that date.

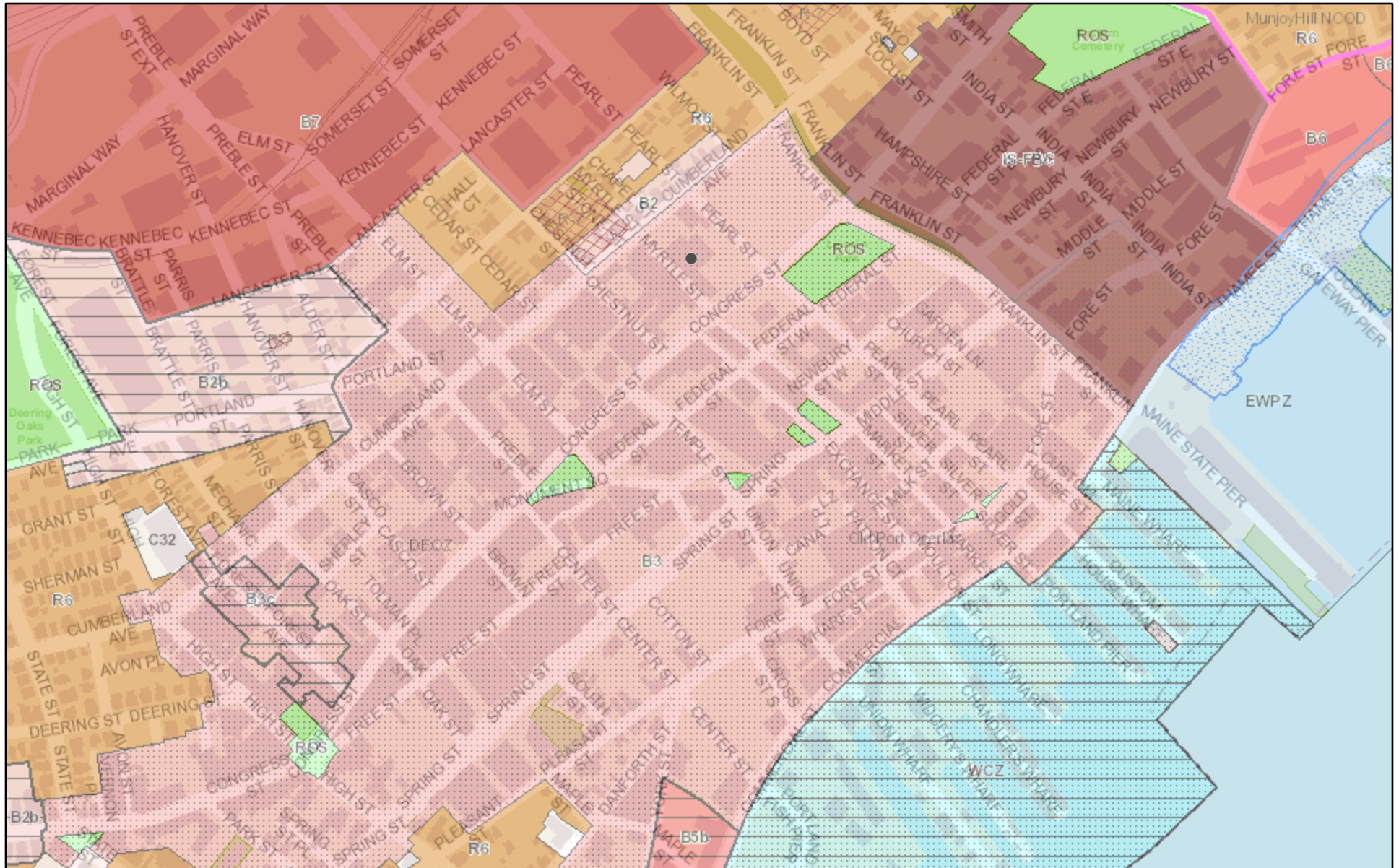
- e. Hostels, provided the applicant submits a site plan and operations plan demonstrating compliance with the following conditions:

- i. All applicable provisions of Article V of this chapter shall be met.
 - ii. Parking shall be provided in compliance with Division 20 of this Article.
 - iii. No unaccompanied minors under the age of eighteen (18) shall be permitted in the facility.
 - iv. The length of stay for transient guests shall not exceed fifteen (15) days out of any sixty-day period.
 - v. The building shall meet the applicable occupant load requirements as defined by the International Building Code and the NFPA Life Safety Code, as such codes are amended or adopted by the city.

- f. Wind energy systems, as defined and allowed in Article X, Alternative Energy.

ArcGIS Web Map

Att. G



2/19/2020, 3:25:42 PM

Zoning	IR-3 Island Residential	R1 Residential	R4 Residential	R6 Residential
IR-1 Island Residential	I-B Island Business	R2 Residential	R5 Residential	R-6A Residential
IR-2 Island Residential	I-TS Island Transfer Station	R3 Residential	R-5A Residential	

